INXPECT

PROFIsafe communication

Reference guide

v25 - EN

Original instructions

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Document updates

Publication date	Code	Updates
MAY 2026	Inxpect 100S_200S PROFIsafe RG_7_00067_en_v25	Added Teach-in function. Updated compatibility with TIA Portal software
DEC 2025	Inxpect 100S_200S PROFIsafe RG_7_00067_en_v24	Added Siemens PLC and TIA Portal compatibility Added note for control unit 0x03 error code Added bits description for sensor 0x8A error code Fixed the typos
SEP 2025	Inxpect 100S_200S PROFIsafe RG_7_00067_en_v23	Fixed the typos

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1. Scope

This document defines the data exchanged through the PROFINET/PROFIsafe Fieldbus interface of Inxpect SRE 100 Series and Inxpect SRE 200 Series.

The scope of this document is to describe and specify the PROFINET/PROFIsafe Fieldbus interface provided by C201A-PNS and C201B-P control units as part of both Inxpect SRE 100 Series and Inxpect SRE 200 Series.

The following topics will be covered:

- Overview of the PROFINET/PROFIsafe Fieldbus interface;
- Definition of the exchanged data;
- Network integration and configuration.

2. Applicability

This release of this document is applicable to the Inxpect SRE 100 Series and Inxpect SRE 200 Series in accordance with:

Core Line:

- GSDML file GSDML-V2.35-Inxpect-ISC-20210622.xml and control unit firmware version 1.4.0.
- GSDML file GSDML-V2.35-Inxpect-ISC-20211125.xml control unit firmware version 1.5.0
- GSDML file GSDML-V2.35-Inxpect-C201A-20220308.xml and control unit firmware version 1.6.0.
- GSDML file GSDML-V2.35-Inxpect-C201A_B-20230127.xml and control unit firmware version 2.0.0.
- GSDML file GSDML-V2.35-Inxpect-C201A_B-20250405.xml and control unit firmware version 2.0.1

eXtended Line:

- GSDML file GSDML-V2.35-Inxpect-C201A_B-20240401.xml and control unit firmware version 2.1.0
- GSDML file GSDML-V2.35-Inxpect-C201A_B-20250505.xml and control unit firmware version 2.1.1

2.1 NOTICE

The following considerations shall be taken into account:

- Inxpect SRE 200 Series supports four detection fields and it is a multi-target system, able to detect up to four targets for each sensor.
- Inxpect SRE 100 Series supports two detection fields and it is a mono-target system, able to detect only the nearest target to each sensor.

For this reason, some data are available only in Inxpect SRE 200 Series. In the document, a note is present where a difference between Inxpect SRE 200 Series and Inxpect SRE 100 Series is present.

Inxpect SRE 100 Series is supported up to control unit firmware version 2.0.0 (for Core Line) and 2.1.0 (for eXtended Line).

3. Siemens PLC and TIA Portal compatibility

The PROFIsafe modules embedded in the control units are compliant only with TIA Portal software (from version 15.1 onward) and Siemens PLCs in the 1200 and 1500 series.

Older versions of Siemens software or older PLC models do not support 12-byte structures.

4. System Overview

C201A-PNS and C201B-P control units, part of both Inxpect SRE 100 Series and Inxpect SRE 200 Series, communicate with the machine control unit via PROFINET/PROFIsafe by means of one of the two RJ45 connectors **[A]** at the bottom (Refer to Figure 3 and Figure 4).

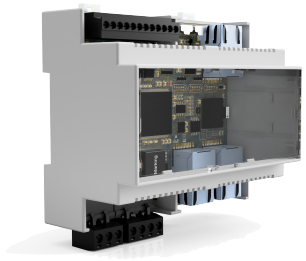


Figure 1 *C201A-PNS device*

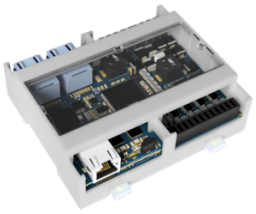


Figure 2 *C201B-P device*

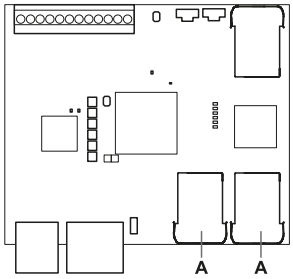


Figure 3 *C201A-PNS structure*

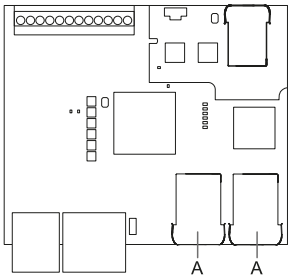


Figure 4 *C201B-P structure*

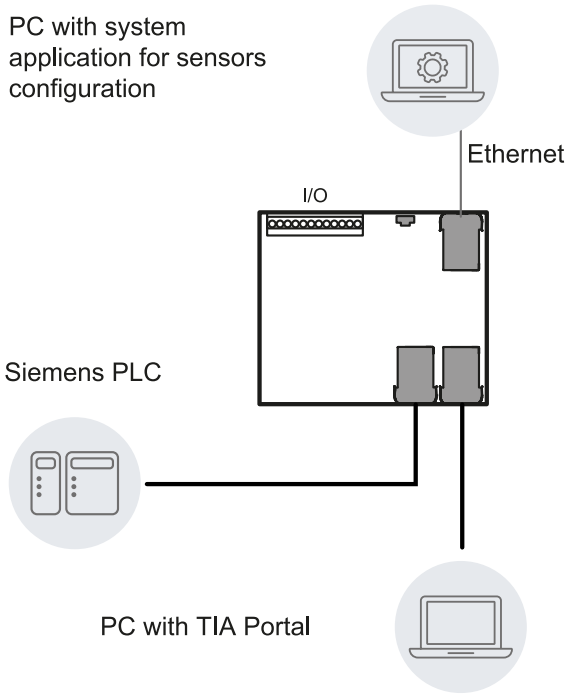
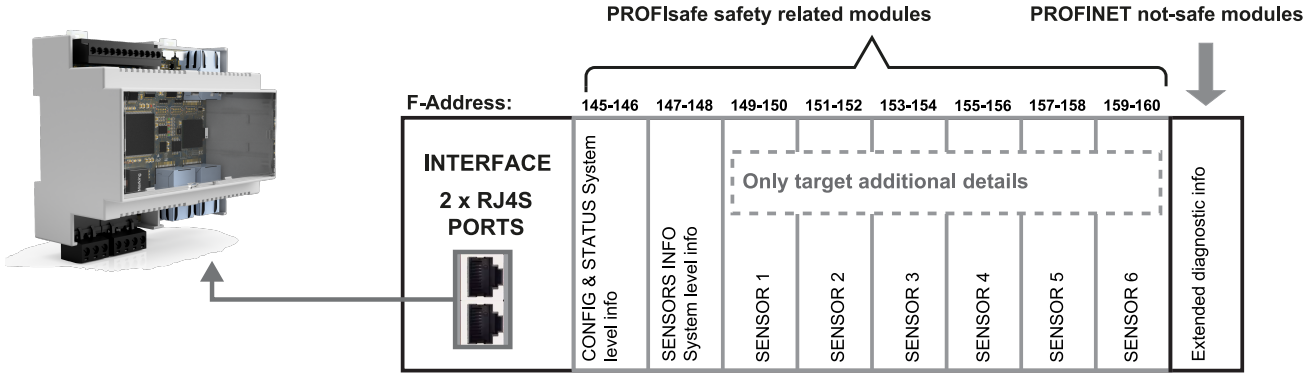


Figure 5 *Example of communication architecture using a Siemens PLC*

4.1 F-submodules and F-addresses

Exchanged input and output information are logically shared into different PROFINET submodules:

- 8 x Fail-safe modules (PROFIsafe safety related modules);
- 1 x Submodule (PROFINET not-safe modules).



IMPORTANT: *in order to ensure compliance with both PROFIsafe V2.6 and PROFIsafe V2.4, the same information block is provided in two sequential F-submodules, one V2.6 compatible and the other V2.4 compatible. They have to be activated in exclusive mode.*

The list of the submodules available on the Inxpect SRE 100 Series and Inxpect SRE 200 Series is reported in the table below.

Submodule	Slot	Description	F-addresses	Module
F-submodule 1	Slot 1	Configuration and Status module (PS2v6)	145	F-Module 1
F-submodule 2	Slot 2	Configuration and Status module (PS2v4)	146	
F-submodule 3	Slot 3	Sensors Information (PS2v6)	147	F-Module 2
F-submodule 4	Slot 4	Sensors Information (PS2v4)	148	
F-submodule 5	Slot 5	Sensor 1 Target Information (PS2v6)	149	F-Module 3
F-submodule 6	Slot 6	Sensor 1 Target Information (PS2v4)	150	
F-submodule 7	Slot 7	Sensor 2 Target Information (PS2v6)	151	F-Module 4
F-submodule 8	Slot 8	Sensor 2 Target Information (PS2v4)	152	
F-submodule 9	Slot 9	Sensor 3 Target Information (PS2v6)	153	F-Module 5
F-submodule 10	Slot 10	Sensor 3 Target Information (PS2v4)	154	
F-submodule 11	Slot 11	Sensor 4 Target Information (PS2v6)	155	F-Module 6
F-submodule 12	Slot 12	Sensor 4 Target Information (PS2v4)	156	
F-submodule 13	Slot 13	Sensor 5 Target Information (PS2v6)	157	F-Module 7
F-submodule 14	Slot 14	Sensor 5 Target Information (PS2v4)	158	
F-submodule 15	Slot 15	Sensor 6 Target Information (PS2v6)	159	F-Module 8
F-submodule 16	Slot 16	Sensor 6 Target Information (PS2v4)	160	
Submodule 17	Slot 17	Extended info module	N.A.	Module 9

At the PROFIsafe layer, F-submodules require a unique address inside the network where they are installed.

The valid range of a F-address is [1...65534].

The F-address (F-DestAddress) of each F-module is settable by the system application.

5. Exchanged data

Data is exchanged in different submodules as described in the following paragraphs.

Note*: 16-bit data are transmitted in big endian format by default. The endianness format is settable by the system application during the configuration of the system.*

5.1 F-Module 1: Configuration and Status

IMPORTANT: *F-Submodule 1 is compliant with PROFIsafe V2.6, whereas F-Submodule 2 is compliant with PROFIsafe V2.4.*

Thi F-Module provides both input and output data:

- Outputs of the device (inputs of the control host) communicate the status of the system, the current dynamic configuration, the status of the OSSDs and hardware input lines, and possible errors.
- Inputs of the device (outputs of the control host) allow the control host to set a new dynamic configuration, to set the state of the OSSDs, perform muting commands on the sensors and save the reference for the anti-tampering functions.

Both exchanged inputs and outputs are encoded in 12-bytes size structures as reported in 5. and Table 1 .

NOTICE: *to interpret the safety stop signal message sent by the control unit to the host, take into account the byte 0 Control unit status (bits 0,1,2,3,5,6 and 7) and byte 1 Restart signal feedback (bits 0,1,2 and 3), see "8. Appendix A" on page 32.*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Control unit status							
1	Restart signal feedback							
2	Static Object Detection Status							
3	Single channel digital inputs							
4	Configuration ID currently in use							
5	CRC32 of the configuration ID currently in use (32 bit)							
6								
7								
8								
9	Digital inputs							
10	Digital outputs							
11	Muting status							

Table 1 *F-Module 1 - Device outputs structure*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	ID of configuration to be set							
1	Group 2 muting request	Group 1 muting request	Muting command					
2	*NA*	*NA*	Saving of anti-tampering reference					
3	*NA*	*NA*	*NA*	*NA*	Digital output command			
4	*NA*	*NA*	*NA*	*NA*	Restart signal			
5	*NA*	*NA*	*NA*	*NA*	Anti-rotation reference saving*	Anti-masking reference saving*	Teach-In function signal **	System recondition
6	*NA*							
7								
8								
9								
10								
11								

Note*: available only if the control unit has firmware version 2.0.1 (or later) or 2.1.1 (or later).*

Note**: only for -WT and -WLT sensors.*

Table 2 *F-Module 1 - Device inputs structure*

5.1.1 F-Module 1: device outputs



Info provided to the PLC:

- Control unit status (diagnostic and feedback)
- Detection Fields status (system level)
- Dynamic Configuration currently activated
- Checksum of the current configuration (CRC32)
- Status of the digital inputs
- Status of the digital outputs
- Muting status

Byte 0 – Control unit status

Byte 1 – Restart signal feedback

Byte 2 – Static Object Detection status

Byte 3 – Single channel digital inputs

Byte 4 – Configuration ID currently in use

Byte 5, 6, 7, 8 – CRC32 of the configuration ID currently in use (32 bit)

Byte 9 – Digital inputs

Byte 10 – Digital outputs

Byte 11 – Muting status

See "8. Appendix A" on page 32 for the meaning of each Bit.

5.1.2 F-Module 1: device inputs



Info provided from the PLC:

- Dynamic Configuration to be activated
- Muting command for each sensor
- Save new references for anti-masking and anti-rotation functions
- Restart signal
- System Recondition signal
- Digital outputs values to be set

Byte 0 – Configuration ID to be set

Byte 1 – Muting command

Byte 2 – Saving of anti-tampering reference *

Byte 3 – Digital output command

Byte 4 – Restart signal

Byte 5 – Generic command signal

Byte 6, 7, 8, 9, 10, 11 – Not used

Note*: deprecated from control unit firmware version 2.0.1 (or later) and 2.1.1 (or later). Use anti-rotation and anti-masking reference bits (Byte 5 generic command signal, bits 1 and 2).*

See "9. Appendix B" on page 33 for the meaning of each Bit.

5.2 F-Module 2: Sensors Information



IMPORTANT: *F-Submodule 3 is compliant with PROFIsafe V2.6, whereas F-Submodule 4 is compliant with PROFIsafe V2.4.*

Thi F-Module provides only output data: the status and information of each sensor.

Exchanged outputs are encoded in 12-bytes size structures as follows.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Sensor 1 status (1/2)							
1	Sensor 1 status (2/2)							
2	Sensor 2 status (1/2)							
3	Sensor 2 status (2/2)							
4	Sensor 3 status (1/2)							
5	Sensor 3 status (2/2)							
6	Sensor 4 status (1/2)							
7	Sensor 4 status (2/2)							
8	Sensor 5 status (1/2)							
9	Sensor 5 status (2/2)							
10	Sensor 6 status (1/2)							
11	Sensor 6 status (2/2)							

Info provided to the PLC, for each sensor:

- Sensor status (diagnostic and feedback)
- Detection Fields status (sensor level)
- Safety Working Mode enabled
- Current presence of a target in each Detection Field

See "10. Appendix C" on page 35 for the meaning of each Bit.

5.3 F-Module 3, 4, 5, 6, 7 and 8: Sensor Target Information



IMPORTANT: *F-Submodules 5, 7, 9, 11, 13 are compliant with PROFIsafe V2.6, whereas F-Submodules 6, 8, 10, 12, 14 are compliant with PROFIsafe V2.4.*

Each Fail-safe module from F-Module 3 to 8 provides only output data: information about the target detected by each sensor.

Exchanged outputs are encoded in 12-bytes size structures as reported in the table below.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	DETECTION FIELD 1 distance (16 bit)							
1								
2	DETECTION FIELD 1 azimuth angle (8 bit)							
3	DETECTION FIELD 2 distance (16 bit)							
4								
5	DETECTION FIELD 2 azimuth angle (8 bit)							
6	DETECTION FIELD 3 distance (16 bit)							
7								
8	DETECTION FIELD 3 azimuth angle (8 bit)							
9	DETECTION FIELD 4 distance (16 bit)							
10								
11	DETECTION FIELD 4 azimuth angle (8 bit)							

***Note**: for Inxpect SRE 100 Series, the only Sensor Target Information available is the distance of the nearest target. This distance is reported equal in both DF 1 and DF 2 distance fields.*

5.3.1 Detection Field distance

Detection Field x distance represents the minimum distance of the target detected in the detection field x. The distance is reported in mm. Value 0 is used in case of no detection.
By default, the value is given in big endian format. It is possible during the configuration of the system to select a little endian format.

5.3.2 Detection Field azimuth angle

Detection Field x azimuth angle represents the azimuth angle of the minimum distance of the target detected in the field x. The angle is reported in degrees (°) in the range (0°, +180°) from its right to its left and centered in 90°.

***Note**: this section is not available for Inxpect SRE 100 Series.*

***Note**: in order to obtain an angle in the range [-90°, +90°] centered in 0°, just subtract 90 to the read value.*

5.4 Module-9: Extended info



Extended info is a not-safe submodule reporting some system information to be used in a not-safe context.

It provides 120-byte output data (inputs of the control host) divided in:

- Control unit and sensor diagnostics as reported in Table 3 . Refer to "6. Control unit and sensor error status" on page 15 for details.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Control unit - Error status							
1 - 2	Control unit - Detailed error status (16 bit)							
3	Sensor 1 - Error status							
4 - 5	Sensor 1- Detailed error status (16 bit)							
6	Sensor 2 - Error status							
7 - 8	Sensor 2 - Detailed error status (16 bit)							
9	Sensor 3 - Error status							
10 -11	Sensor 3 - Detailed error status (16 bit)							
12	Sensor 4 - Error status							
13 - 14	Sensor 4 - Detailed error status (16 bit)							
15	Sensor 5 - Error status							
16 - 17	Sensor 5 - Detailed error status (16 bit)							
18	Sensor 6 - Error status							
19 - 20	Sensor 6 - Detailed error status (16 bit)							

Table 3 *Extended Info module - Error status*

- Target distance and azimuth angle of each sensor (as reported in Table 4 , Table 5 , Table 6 , Table 7 , Table 8 and Table 9). They are the current distance and azimuth angle of a target detected by each sensor. For details as data are encoded, refer to "5.3.1 Detection Field distance" on the previous page and par. "5.3.2 Detection Field azimuth angle" on the previous page.

  Note*: for Inxpect SRE 100 Series, the only Sensor Target Information available is the distance of the nearest target. This distance is reported equal in both Detection Field 1 and Detection Field 2 distance fields.*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
21 - 22	Sensor 1 - Detection Field 1 distance (16 bit)							
23	Sensor 1 - Detection Field 1 angle (8 bit)							
24 - 25	Sensor 1 - Detection Field 2 distance (16 bit)							
26	Sensor 1 - Detection Field 2 angle (8 bit)							
27 - 28	Sensor 1 - Detection Field 3 distance (16 bit)							
29	Sensor 1 - Detection Field 3 angle (8 bit)							
30 - 31	Sensor 1 - Detection Field 4 distance (16 bit)							
32	Sensor 1 - Detection Field 4 angle (8 bit)							

Table 4 *Extended Info module - Target distances and azimuth angles for Sensor 1*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
33 - 34	Sensor 2 - Detection Field 1 distance (16 bit)							
35	Sensor 2 - Detection Field 1 azimuth angle (8 bit)							
36 - 37	Sensor 2 - Detection Field 2 distance (16 bit)							
38	Sensor 2 - Detection Field 2 azimuth angle (8 bit)							
39 - 40	Sensor 2 - Detection Field 3 distance (16 bit)							
41	Sensor 2 - Detection Field 3 azimuth angle (8 bit)							
42 - 43	Sensor 2 - Detection Field 4 distance (16 bit)							
44	Sensor 2 - Detection Field 4 azimuth angle (8 bit)							

Table 5 *Extended Info module - Target distances and azimuth angles for Sensor 2*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
45 - 46	Sensor 3 - Detection Field 1 distance (16 bit)							
47	Sensor 3 - Detection Field 1 azimuth angle (8 bit)							
48 - 49	Sensor 3 - Detection Field 2 distance (16 bit)							
50	Sensor 3 - Detection Field 2 azimuth angle (8 bit)							
51 - 52	Sensor 3 - Detection Field 3 distance (16 bit)							
53	Sensor 3 - Detection Field 3 azimuth angle (8 bit)							
54 - 55	Sensor 3 - Detection Field 4 distance (16 bit)							
56	Sensor 3 - Detection Field 4 azimuth angle (8 bit)							

Table 6 *Extended Info module - Target distances and azimuth angles for Sensor 3*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
57 - 58	Sensor 4 - Detection Field 1 distance (16 bit)							
59	Sensor 4 - Detection Field 1 azimuth angle (8 bit)							
60 -61	Sensor 4 - Detection Field 2 distance (16 bit)							
62	Sensor 4 - Detection Field 2 azimuth angle (8 bit)							
63 - 64	Sensor 4 - Detection Field 3 distance (16 bit)							
65	Sensor 4 - Detection Field 3 azimuth angle (8 bit)							
66 - 67	Sensor 4 - Detection Field 4 distance (16 bit)							
68	Sensor 4 - Detection Field 4 azimuth angle (8 bit)							

Table 7 *Extended Info module - Target distances and azimuth angles for Sensor 4*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
69 - 70	Sensor 5 - Detection Field 1 distance (16 bit)							
71	Sensor 5 - Detection Field 1 azimuth angle (8 bit)							
72 -73	Sensor 5 - Detection Field 2 distance (16 bit)							
74	Sensor 5 - Detection Field 2 azimuth angle (8 bit)							
75 - 76	Sensor 5 - Detection Field 3 distance (16 bit)							
77	Sensor 5 - Detection Field 3 azimuth angle (8 bit)							
78 - 79	Sensor 5 - Detection Field 4 distance (16 bit)							
80	Sensor 5 - Detection Field 4 azimuth angle (8 bit)							

Table 8 *Extended Info module - Target distances and azimuth angles for Sensor 5*

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
81 - 82	Sensor 6 - Detection Field 1 distance (16 bit)							
83	Sensor 6 - Detection Field 1 azimuth angle (8 bit)							
84 -85	Sensor 6 - Detection Field 2 distance (16 bit)							
86	Sensor 6 - Detection Field 2 azimuth angle (8 bit)							
87 - 88	Sensor 6 - Detection Field 3 distance (16 bit)							
89	Sensor 6 - Detection Field 3 azimuth angle (8 bit)							
90 - 91	Sensor 6 - Detection Field 4 distance (16 bit)							
92	Sensor 6 - Detection Field 4 azimuth angle (8 bit)							

Table 9 *Extended Info module - Target distances and azimuth angles for Sensor 6*

Note*: only one target data (distance) is available for Inxpect SRE 100 Series.*

- Control unit and sensors status as reported in Table 10 . Refer to par. "5.1 F-Module 1: Configuration and Status" on page 7 and par. "5.2 F-Module 2: Sensors Information " on page 9 for details.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
93	Control unit status							
94	Sensor 1 status (1/2)							
95	Sensor 1 status (2/2)							
96	Sensor 2 status (1/2)							
97	Sensor 2 status (2/2)							
98	Sensor 3 status (1/2)							
99	Sensor 3 status (2/2)							
100	Sensor 4 status (1/2)							
101	Sensor 4 status (2/2)							
102	Sensor 5 status (1/2)							
103	Sensor 5 status (2/2)							
104	Sensor 6 status (1/2)							
105	Sensor 6 status (2/2)							

Table 10 *Extended Info module - Status*

- Static Object Detection status of sensors as reported (as reported in Table 11). Refer to par. "5.1 F-Module 1: Configuration and Status" on page 7 for details.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
106	Static object detection status of sensor 1							
107	Static object detection status of sensor 2							
108	Static object detection status of sensor 3							
109	Static object detection status of sensor 4							
110	Static object detection status of sensor 5							
111	Static object detection status of sensor 6							

Table 11 *Static object detection status of sensors*

The byte containing the status of the Static Object Detection option is encoded as a bit mask as follows:

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
106 - 111	*NA*	*NA*	*NA*	*NA*	Static Object Detection Field 4 (available only in Inxpect SRE 200 Series*)	Static Object Detection Field 3 (available only in Inxpect SRE 200 Series*)	Static Object Detection Field 2 (available only in Inxpect SRE 200 Series*)	Static Object Detection Field 1 (available only in Inxpect SRE 200 Series*)

where

- 0 = “Static object detected
- 1 = “Free”

Note*: only if control unit has firmware version 1.5.0 or later.*

- Teach-In function feedback status * (as reported in Table 12).

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
112	Teach-In function feedback status							

Table 12 *Teach-In function feedback status*

Note*: only for -WT and -WLT sensors.*

The Teach-In function feedback status is a value from 0 to 3 and represents one of the following conditions:

- 0 = end of the validation; at the same time, the output set as Teach-In feedback signal switches to OFF-state
- 1 = start of the learning phase; at the same time, the output set as Teach-In feedback signal switches to ON-state
- 2 = end of the learning phase; at the same time, the output set as Teach-In feedback signal flashes slowly (500 ms ON-state followed by 1500 ms OFF-state)
- 3 = fault condition; at the same time, the output set as Teach-In feedback signal flashes faster (500 ms ON-state followed by 500 ms OFF-state)

- Teach-In function distances * (as reported in Table 13). They represent the distances of the targets as a result of the Teach-In function.

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
113	Sensor 1 Teach-In function distance [dm]							
114	Sensor 2 Teach-In function distance [dm]							
115	Sensor 3 Teach-In function distance [dm]							
116	Sensor 4 Teach-In function distance [dm]							
117	Sensor 5 Teach-In function distance [dm]							
118	Sensor 6 Teach-In function distance [dm]							

Table 13 *Teach-In function distances*

Note*: only for -WT and -WLT sensors.*

- Reserved extra info for future implementation (as reported in Table 14).

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
119	*NA*							

Table 14 *Extended Info module - Extra info*

6. Control unit and sensor error status

Erroneous conditions related to the control unit and/or the sensors are sent via Fieldbus filling up the relevant error code and detailed error mask fields.

The error code indicates the type of the error occurred. The detailed error mask represents the details related to the type of the error occurred and it is reported in this document where relevant and useful to understand in detail the fault.

In the following paragraphs, all the control unit and sensor error codes are listed and described.

6.1 Control unit error codes

The error codes of the control unit are reported in the table below.

Error Code	Error	Description
0x01	Power supply error	At least one voltage value on the control unit is wrong. Detailed error is a bit mask composed of the following faults: • 0x0001 Vin Undervoltage • 0x0002 Vin Overvoltage • 0x0004 1.2V Undervoltage • 0x0008 1.2V Overvoltage • 0x0010 1.2V Sensor Undervoltage • 0x0020 1.2V Sensor Overvoltage • 0x0040 VUSB Undervoltage • 0x0080 VUSB Overvoltage • 0x0100 VRef Undervoltage • 0x0200 VRef Overvoltage • 0x0400 ADC conversion error
0x02	Internal temperature error	Control unit temperature value is wrong. Detailed error is a bit mask composed of the following faults: • 0x0001 Low Temperature • 0x0002 High Temperature
0x03	OSSD error	At least one digital output (OSSD) is in error. Detailed error is a bit mask composed of the following faults: • 0x0001 OSSD 1 SHORT-CIRCUIT • 0x0002 OSSD 2 SHORT-CIRCUIT • 0x0004 OSSD 3 SHORT-CIRCUIT • 0x0008 OSSD 4 SHORT-CIRCUIT • 0x0010 OSSD 1 NO LOAD • 0x0020 OSSD 2 NO LOAD • 0x0040 OSSD 3 NO LOAD • 0x0080 OSSD 4 NO LOAD • 0x0100 OSSD 1 SHORT-CIRCUIT (VDD) • 0x0200 OSSD 2 SHORT-CIRCUIT (VDD) • 0x0400 OSSD 3 SHORT-CIRCUIT (VDD) • 0x0800 OSSD 4 SHORT-CIRCUIT (VDD) ***Note**: the errors are reported only if the error occur and the Short-circuit/Open circuit diagnostics option has been enabled in the system application and the outputs are safety-related.*
0x04	Input error	At least one digital input is in error. Detailed error is a bit mask composed of the following faults: • 0x0001 input 1 error • 0x0002 input 2 error • 0x0003 encoding error • 0x0004 0-1-0 plausibility transition error

Error Code	Error	Description
0x05	Internal peripheral error	There is an error with at least one of the control unit peripherals Detailed error not relevant.
0x06	Sensor communication error	Communication error with at least one sensor. Detailed error is a bit mask composed of the following faults: • 0x0010 Communication lost • 0x0100 Polling timeout
0x07	Internal EEPROM error	Configuration saving error, configuration not performed or memory error. Detailed error not relevant.
0x08	Internal flash error	Flash memory error. Detailed error not relevant.
0x09	Internal RAM error	Invalid checksum of the internal RAM. Detailed error not relevant.
0x0A	Fieldbus error	At least one of the inputs and outputs has been configured as “Fieldbus controlled”, but the Fieldbus communication is not established, in error or passivated by the host. Detailed error not relevant.
0x0B	Dynamic configuration error	An invalid dynamic configuration has been selected. Detailed error not relevant.
0x0C	Internal communication error	An internal communication issue occurred between microprocessors. Detailed error not relevant.
0x0D	Sensor configuration error	Error occurred on the sensors during the configuration process or at system power up. At least one of the connected sensors did not get the correct configuration. The list of the not-configured sensors is reported as the detail of this error.
0x0E	Backup or Restore error	Error occurred during the backup or restore via SD card

6.2 S101A sensor error codes

The error codes of the S101A sensor are reported in the table below.

Error Code	Error	Description
0x06	Control unit communication error	Communication error with the control unit. Detailed error is a bit mask composed of the following faults: • 0x0010 Communication lost
0x81	Power supply error	At least one voltage value of the sensor is wrong . Detailed error is a bit mask composed of the following faults: • 0x0001 Vin Undervoltage • 0x0002 Vin Overvoltage • 0x0004 3.3V Undervoltage • 0x0008 3.3V Overvoltage • 0x0010 1.2V Undervoltage • 0x0020 1.2V Overvoltage • 0x0040 V+ Undervoltage • 0x0080 V+ Overvoltage • 0x0100 V DC/DC Undervoltage • 0x0200 V DC/DC Overvoltage • 0x0400 VOp.Amp. Undervoltage • 0x0800 VOp.Amp. Overvoltage • 0x1000 VADC Ref. Undervoltage • 0x2000 VADC Ref. Overvoltage • 0x4000 ADC conversion error
0x82	Internal temperature error	Sensor temperature value is wrong. Detailed error is a bit mask composed of the following faults: • 0x0001 Low Temperature • 0x0002 High Temperature • 0x0004 Chip - Low Temperature • 0x0008 Chip - High Temperature • 0x0010 Generic Temperature Error
0x84	Internal peripheral error	At least one of the sensor peripherals is in error. Detailed error not relevant.
0x85	Control unit communication error	Communication error with the control unit. Detailed error is a bit mask composed of the following faults: • 0x0001 Communication timeout • 0x0002 Cross-check error • 0x0004 Sequence number error • 0x0008 Wrong CRC • 0x0020 Protocol error • 0x0040 Message ID error • 0x0080 Data format error • 0x0100 Polling timeout • 0x0200 Generic CANbus error

Error Code	Error	Description
0x8F	Signal error	Signal errors of the sensor. Detailed error is a bit mask composed of the following faults: • 0x0001 Not used • 0x0002 Head fault • 0x0004 Head power off • 0x0008 Signal dynamic • 0x0010 Signal Min • 0x0020 Signal Min Max • 0x0040 Signal Max • 0x0080 Signal Avg • 0x0100 Dynamic Low • 0x0200 Min Dynamic High • 0x0400 Min Dynamic Low • 0x0800 Max Dynamic Low • 0x1000 Avg Dynamic Low • 0x2000 Generic Signal Error
0x90	Accelerometer error	Placement error of the sensor. Detailed error is a bit mask composed of the following faults: • 0x0001 Tilt angle error • 0x0002 Roll angle error • 0x0004 Reading error
0xFD	Masking error	Masking/Occlusion error

6.3 SRE 200 Series sensor error codes

The error codes of the SRE 200 Series sensor are reported in the table below.

Error Code	Error	Description
0x06	Control unit communication error	Communication error with the control unit. Detailed error is a bit mask composed of the following faults: • 0x0010 Communication lost
0x81	Misconfiguration error	The misconfiguration error occurs when the sensor does not have a valid configuration or it has received an invalid configuration from the control unit. Detailed error not relevant.
0x82	Status error	The status error occurs when the sensor is in an internal invalid status. Detailed error not relevant.
0x83	Protocol error	The protocol error occurs when the sensor receives commands with an unknown format. Detailed error not relevant.
0x84	Fault error	The fault error occurs when the sensor has reached an internal fault condition. Detailed error not relevant.

Error Code	Error	Description
0x85	Control unit communication error	Communication error with the control unit. Detailed error is a bit mask composed of the following faults: • 0x0001 Communication timeout • 0x0002 Cross-check error • 0x0004 Sequence number error • 0x0008 Wrong CRC • 0x0020 Protocol error • 0x0040 Message ID error • 0x0080 Data format error • 0x0100 Polling timeout • 0x0200 Generic CANbus error
0x86	Power error	At least one voltage value of the sensor is wrong . Detailed error is a bit mask composed of the following faults: • 0x0001 Vin Undervoltage • 0x0002 Vin Overvoltage • 0x0004 3.3V Undervoltage • 0x0008 3.3V Overvoltage • 0x0010 1.8V Undervoltage • 0x0020 1.8V Overvoltage • 0x0040 1.2V Undervoltage • 0x0080 1.2V Overvoltage • 0x0100 1V Undervoltage • 0x0200 1V Overvoltage
0x87	MSS error	Error detected by diagnostics relative to the internal micro-controller (MSS), its internal peripherals or memories. Detailed error not relevant.
0x88	Signal error	The signal error occurs when the sensor detects an error in the RF signal part. Detailed error not relevant.
0x89	Internal temperature error	Sensor temperature value is wrong. Detailed error is a bit mask composed of the following faults: • 0x0001 Low Temperature • 0x0002 High Temperature • 0x0004 Chip - Low Temperature • 0x0008 Chip - High Temperature • 0x0010 IMU - Low Temperature • 0x0020 IMU - High Temperature
0x8A	Tamper error	Placement error of the sensor. Detailed error is: first 4 bits, a bit mask composed of the following faults: • 0x0001 Pan angle error • 0x0002 Roll angle error • 0x0003 Pan+roll angle error • 0x0004 Tilt angle error • 0x0005 Pan+tilt angle error • 0x0006 Roll+titl angle error • 0x0007 Pan+roll+tilt angle error bit 4 to bit 7: tilt angle deviation (in degrees) bit 8 to bit 11: roll angle deviation (in degrees) bit 12 to bit 15: pan angle deviation (in degrees) Max deviation in degrees: 15.

Error Code	Error	Description
0x8B	DSS error	Error detected by diagnostics relative to the internal micro-controller (DSS), its internal peripherals or memories. Detailed error not relevant.
0xFD	Masking error	Masking/Occlusion error
0xFE	Masking reference error	The sensor is not able to acquire the reference for masking functionality.

7. Integration of C201A-PNS or C201B-P in a PROFINET/PROFIsafe network

To integrate the control unit in a PROFINET/PROFIsafe network, an external tool is needed. Using this tool, it is also possible to program the PLC with the updated network project. The following guide refers to the software *Siemens TIA Portal* with *STEP 7 Safety option* (v.17) for Microsoft Windows.

The following aspects are covered:

1. how to add the control unit in a PROFINET/PROFIsafe network and to program a PLC to deal with the new device
2. how to exchange data between the PLC and the control unit
3. how to manage all data exchanged with the control unit safety module using TIA Portal Library file

Note: *the control unit supports the connection with a single PLC.*

7.1 Add the control unit

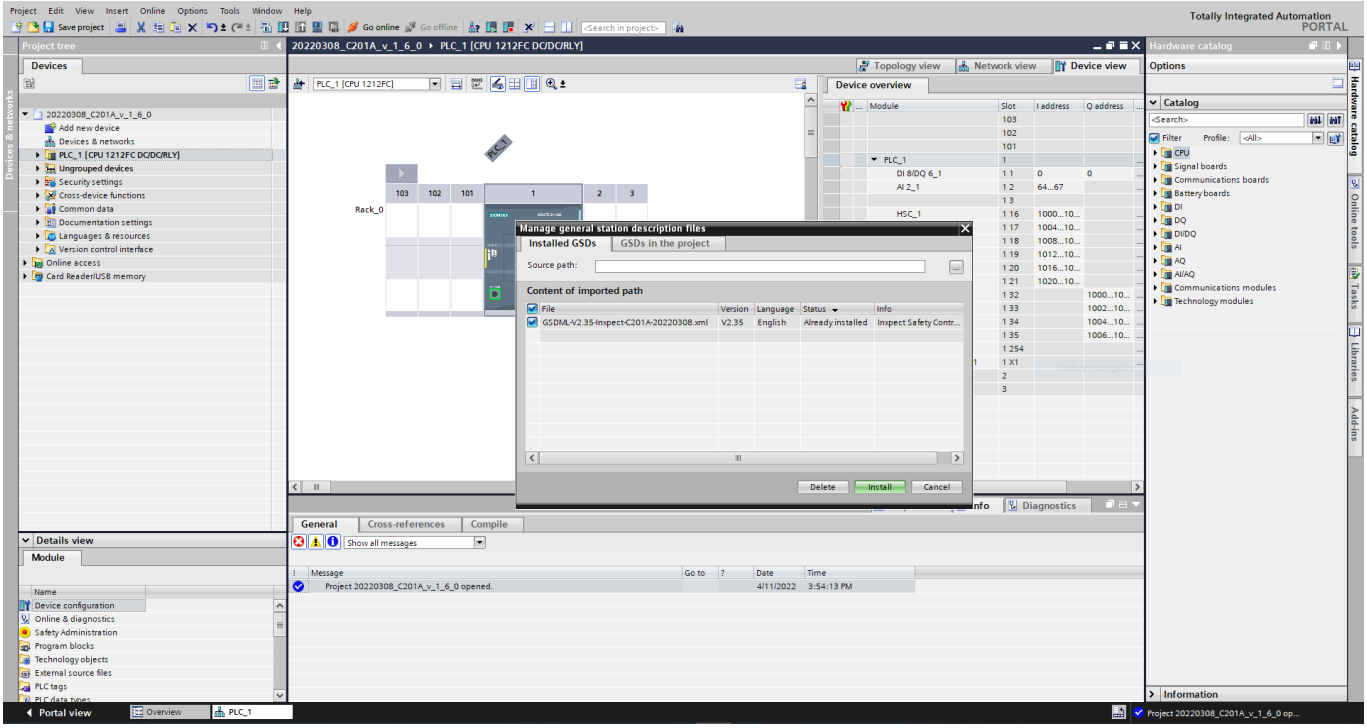
7.1.1 Update the GSDML files list

Based on the firmware version of the control unit, download the GSDML file from https://tools.inxpect.com.

To manage the new GSDML file, go to the menu:

- *Options -> Manage general station description files (GSD)*

and select the path where the GSDML file for the control unit is located on your computer. Then check the file and click on *Install*.



7.1.2 Search and add the control unit

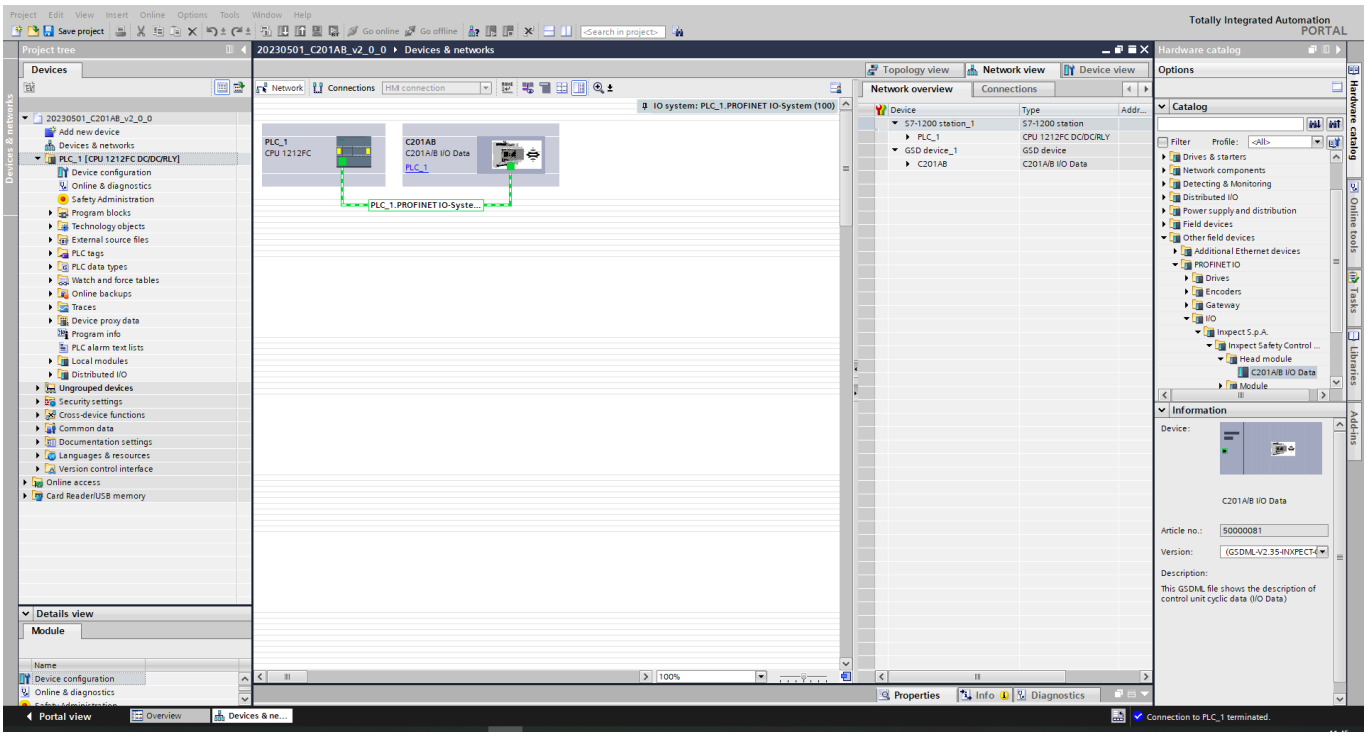
After updating the GSDML files list, open the *Devices and networks* menu. In the Hardware catalog go to the folder:

- *Other field devices -> PROFINET IO -> I/O ->Inxpect S.p.A. -> Inxpect Safety Control unit -> Head module*

and select *C201A/B I/O Data*. With a double click or with a drag and drop operation, it is possible to add the device in the network project.

In the *Network view*, click on the link label *not assigned* and choose the PLC to connect to.

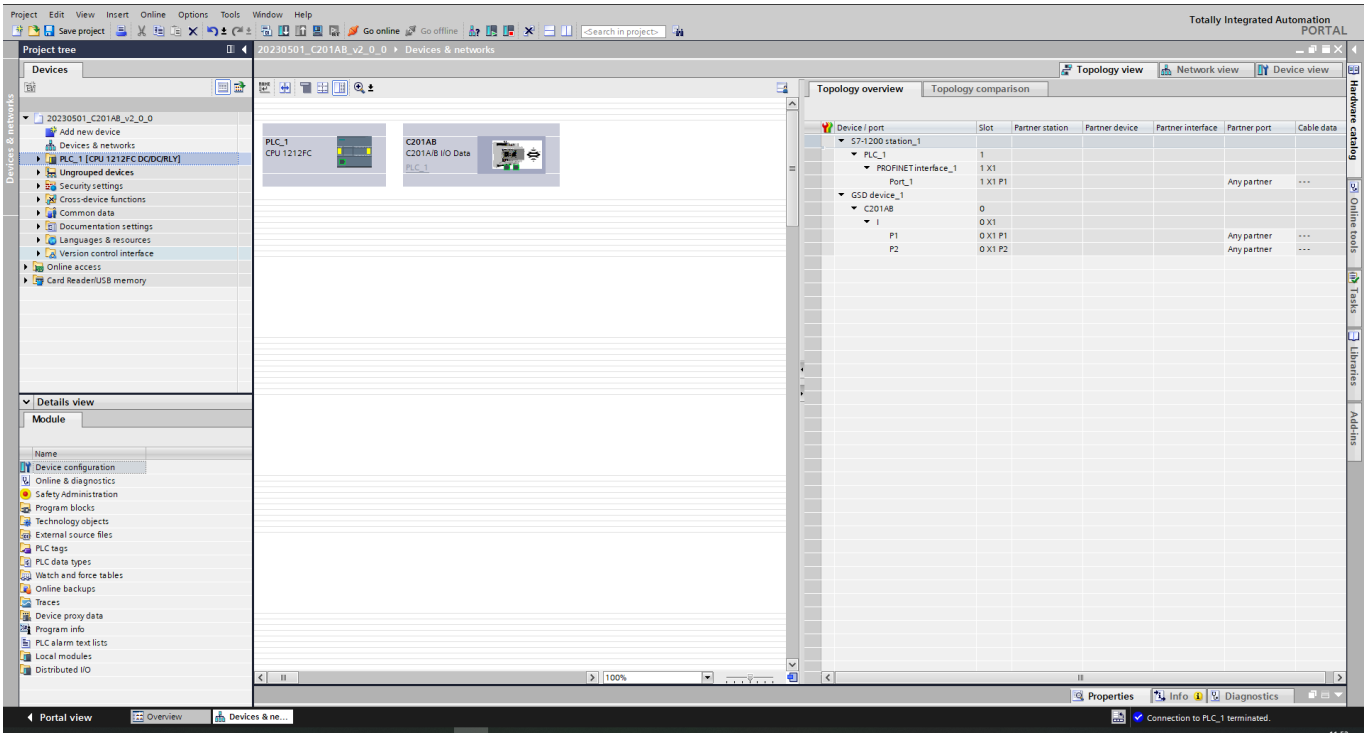
In this way, the control unit has been added to the PROFINET/PROFIsafe network of the PLC.



7.1.3 Set the topology

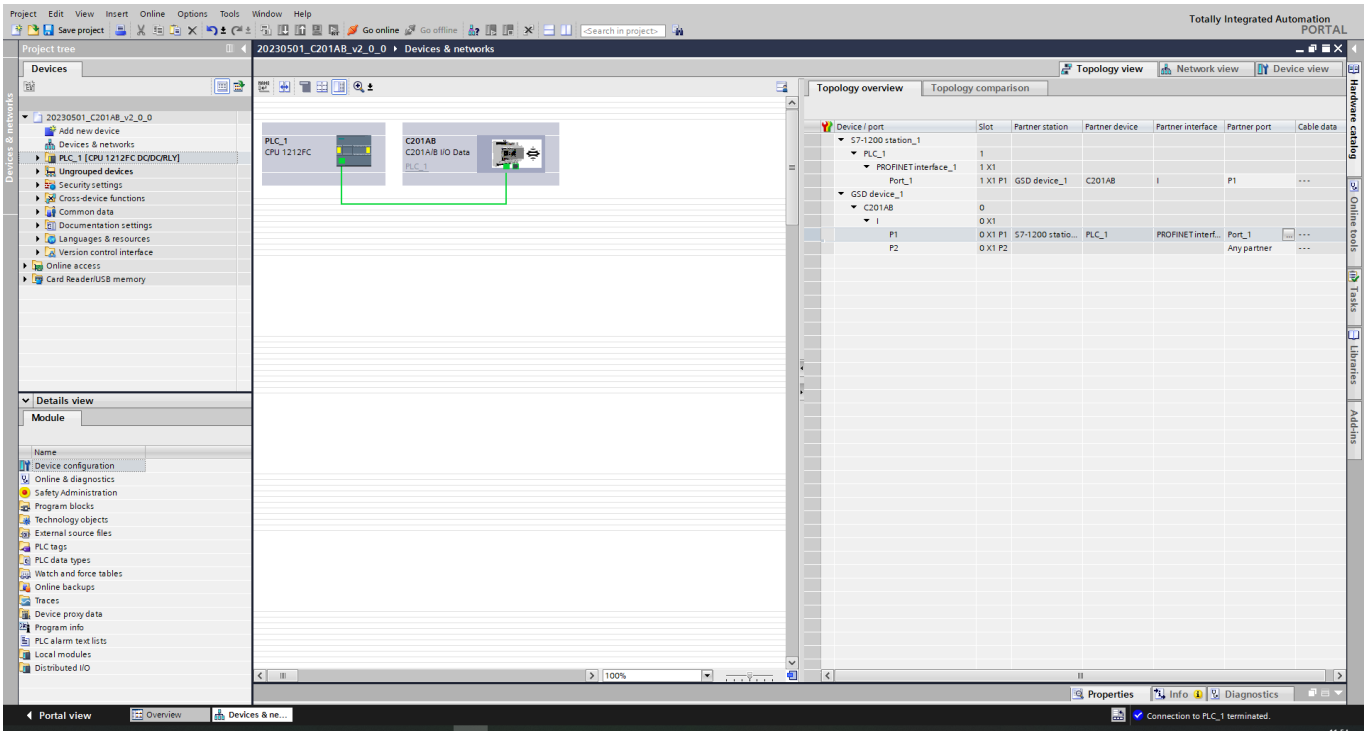
The control unit has two Ethernet ports reserved for the Fieldbus interface.

Note: *the control unit can automatically manage them and to switch among them, if needed.*



To configure the topology connection, please select the PLC Ethernet port and drag and drop it to the specific control unit Ethernet port used for this purpose.

Note: *every connection of the PLC on the wrong port is going to lead to an error on the Fieldbus communication.*



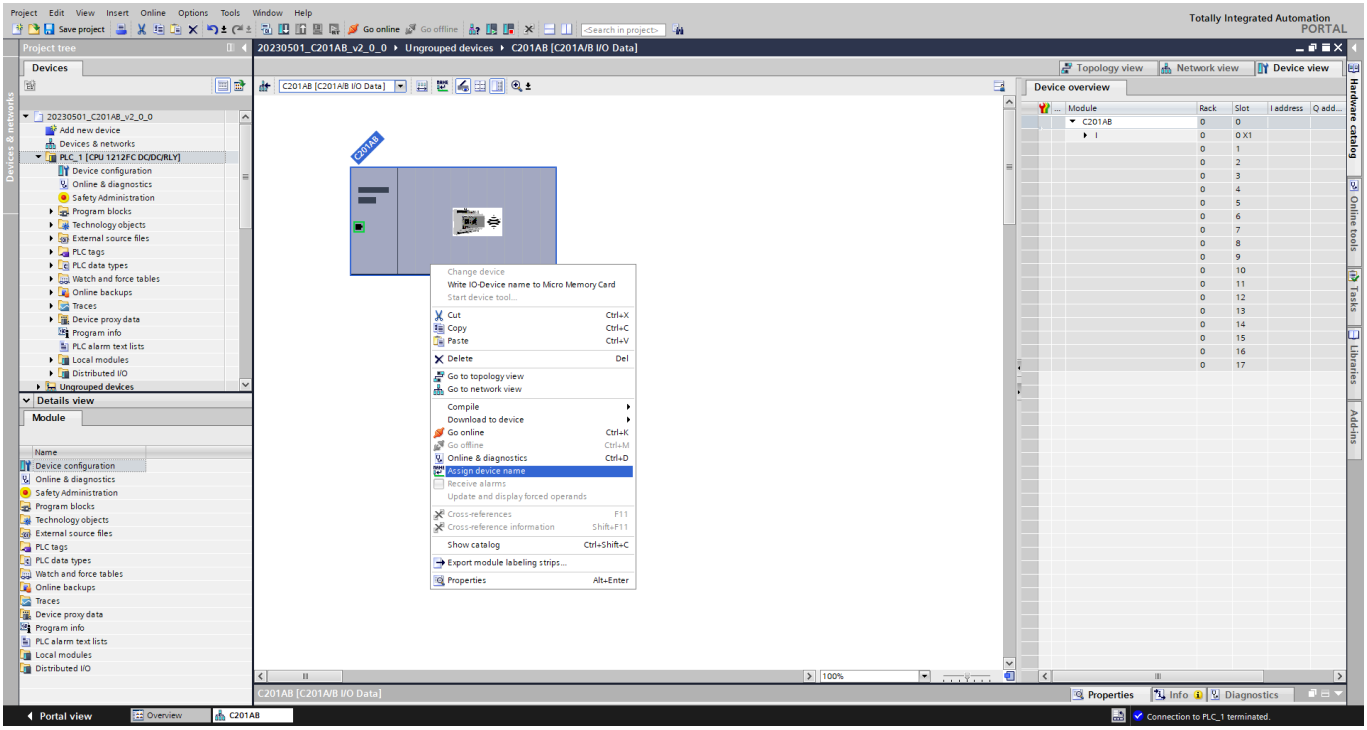
7.1.4 Set the device name

A brand-new control unit has the following default values:

- device name: *void*
- IP address: 0.0.0.0

Once the device is connected to the network, it is possible to set its device name through the TIA Portal interface.

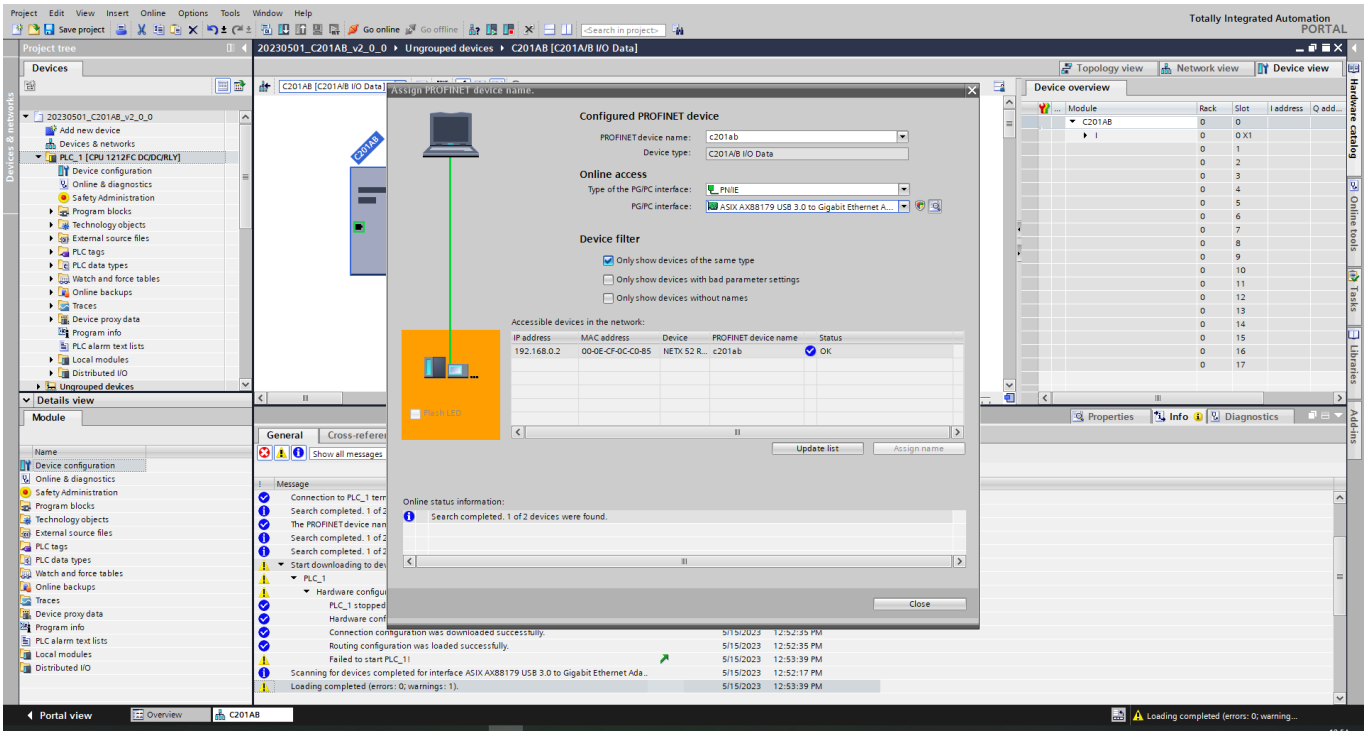
In the *Device view* form, choose the control unit, right click on the device image and select *Assign device name*.



In the following window:

1. Set the device name; note that the same name cannot be used for more than one device in the same network.
2. Set the *Online access* interface.
3. Click on *Update list*.

Then, search for the actual MAC address of your device in the list and click on *Assign name*.



The device name must comply with the coding rules following the PROFINET specification, excerpt from the "Name of Station".

A Name of Station:

- has a length of 1–240 characters.
- may consist of one or more labels.
- must contain only the following characters:
  - lower case letters (a–z),
  - digits (0–9),
  - minus sign (-),
  - dot (.), used to separate labels.
- must not begin or end with a dot or with a minus sign.

A Name of Station label:

- has a length of 1–63 characters
- is separated from another label by a dot.
- must not begin or end with a minus sign.

7.1.5 Add I/O modules

In the *Device view* form, it is possible to add to the project the desired modules with a double click (or a drag and drop operation) from the folder *Module*.

The safety modules are divided in v2.4 and v2.6. All modules have a fixed slot position.

When a module is added, the tool assigns automatically the I/O variables addresses used by the PLC code.

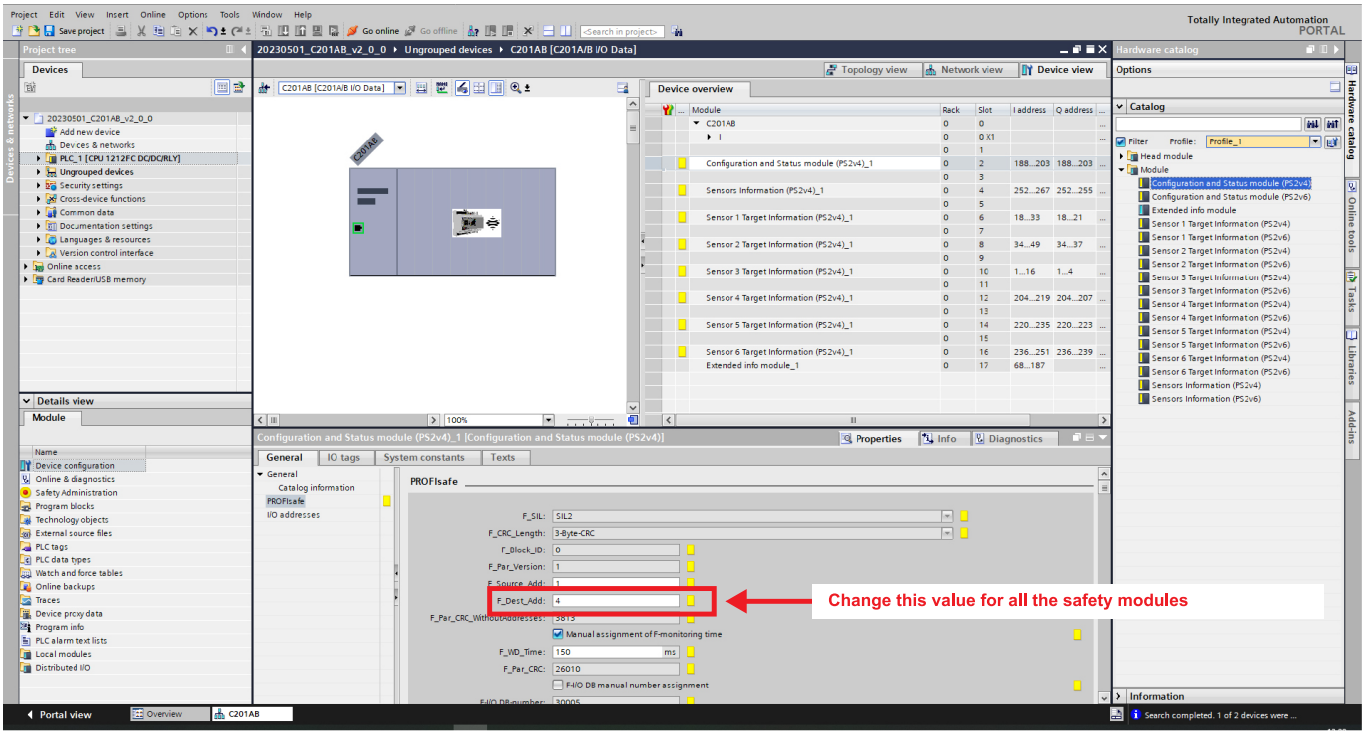
Each safety module must have the same PROFIsafe F-address *(F_Dest_Add)* configured within the system application *(Admin > Fieldbus parameters, see following image with the default values)*.

Note: *on the contrary, the F_Source_Add depends on the PLC configuration.*

F-addresses

At the PROFIsafe layer, F-submodules require an unique address inside the net where they are installed.

F-Module	PS2v6	PS2v4
Configuration and Status module	145	146
Sensors Information	147	148
Sensor 1 Target Information	149	150
Sensor 2 Target Information	151	152
Sensor 3 Target Information	153	154
Sensor 4 Target Information	155	156
Sensor 5 Target Information	157	158
Sensor 6 Target Information	159	160



IMPORTANT: *the F-Destination addresses must be unique in the network. Consequently, if more than one control unit is used, the addresses in the table (Admin > Fieldbus parameters) must be changed to have unique F-Dest_add.*

7.2 Use the control unit in a Safety PLC program

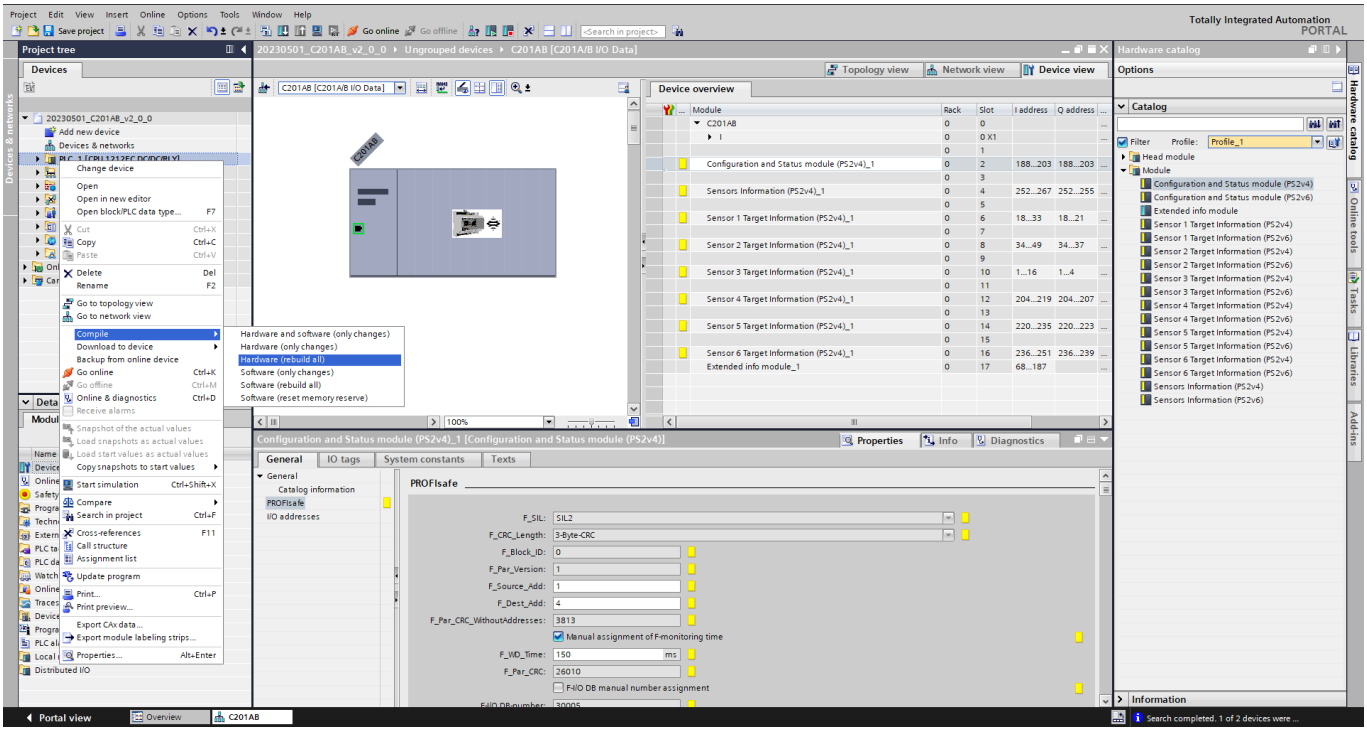
7.2.1 Connection and module test

At the startup, the first LED (G1) on the control unit is steady green (normal behavior) and the third LED (G3) is steady red (no physical link).

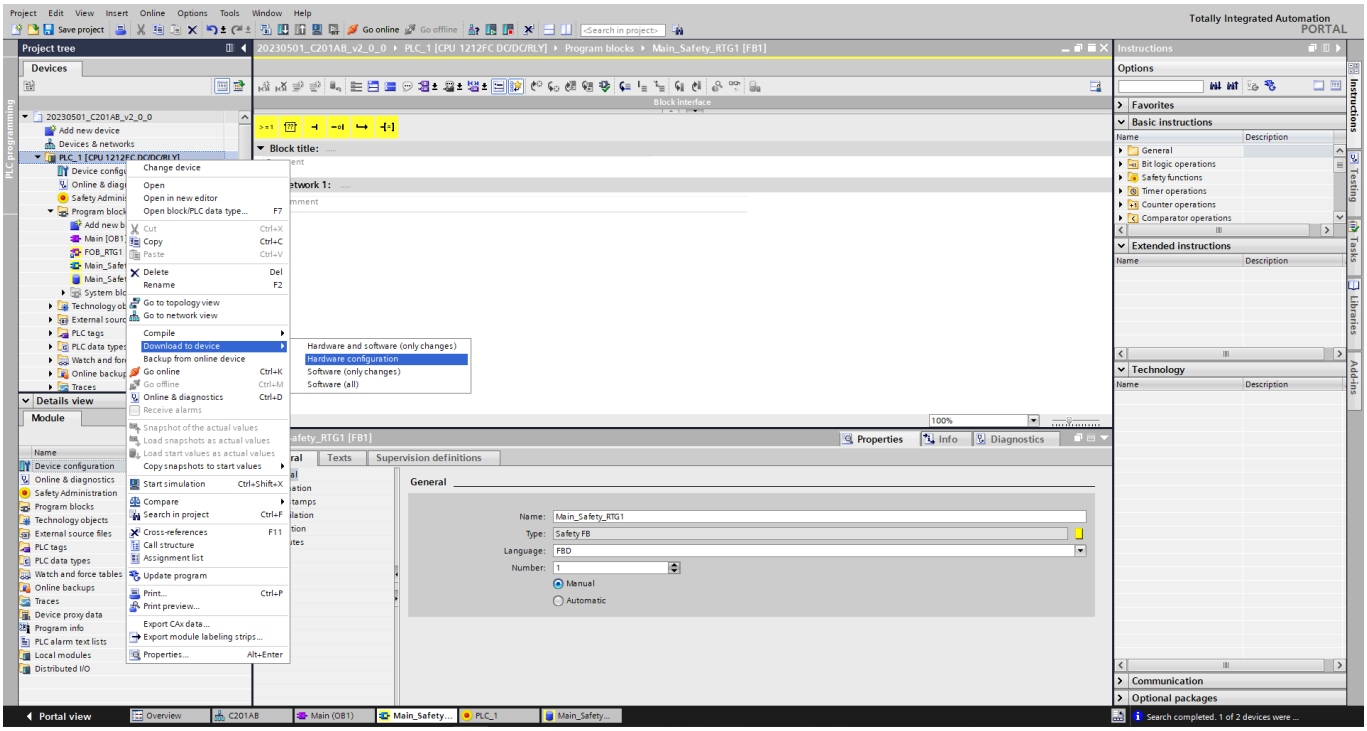
Once an Ethernet cable is connected, G3 starts flashing red (no data exchange) and then, if the connection is established correctly, it switches off.

Regardless of the connection status, the fifth LED (G5) is going to switch on (steady red) if an error occurs on PROFINET or PROFIsafe layers (e.g., errors about device name or safety destination addresses settings).

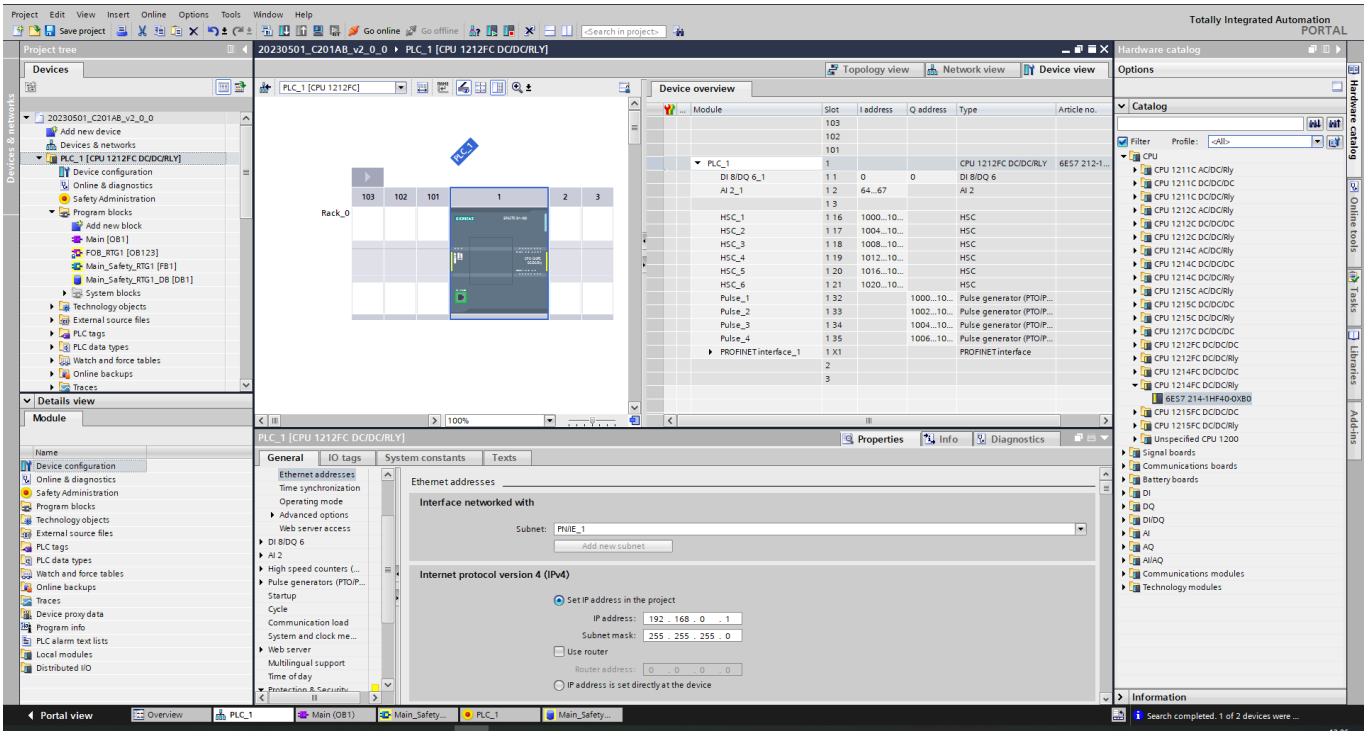
To test the connection, it is necessary to do a HW compile, by right clicking in the Project tree on *PLC > Compile > Hardware*.



After that, it is necessary to load the network configuration on the PLC *(PLC > Download to device > Hardware configuration)*.



Note: *a connection between the PLC and the computer on which the TIA Portal is running is needed. In the Device view form, it is possible to choose as PROFINET device also the PLC and see its properties like the IP address. This is useful to establish an Ethernet connection between PLC and computer.*



7.2.2 Modules and variables test

In order for a specific variable to be visible in the *Watch and force table* and for the user to have the possibility to test if the data exchange is working correctly, at least a variable (even if different from the previously mentioned specific variable) of the same module must be used in a PLC program.

Otherwise, all the variables of the module are passivated and their value is not changing in the table.

Manage the variables

In a PLC program, it is possible to refer to a variable using its address or a Tag name. For example, if the first input byte of a module has address 1, it is possible to refer to its first bit 0 with address:

- *%I1.0*

where “I” is the abbreviation for input, the “1” is the module number and the “0” is the bit number.

Note: *if the user wants to refer to an output variable, he must use the “Q” instead of “I” (for example %Q1.0).*

Note: *this is true for boolean type management.*

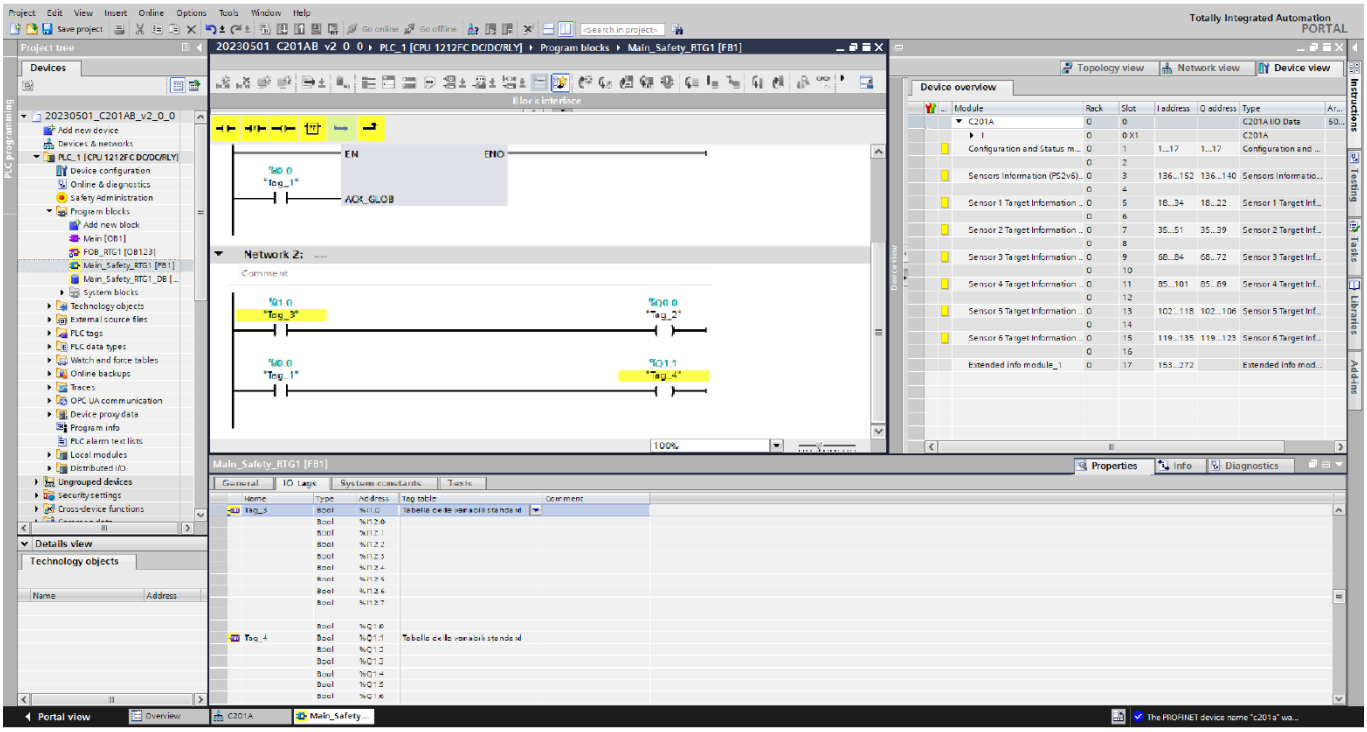
Variables and their addresses and types are visible in the properties of the modules *(Properties > IO tags)* and here it is possible to set the Tag names for each variable. All tag names are visible also in the Project tree *(PLC > PLC tags)*.

Manage the instructions

To create a simple program, two instructions are enough: a *Normally open contact* instruction (input variable) linked with an *Assignment* instruction (output variable).

It is suggested to use PLC physical I/O or PLC internal memory variables as support variables.

In the following example, we use the control unit safety input variable to set a PLC physical output and a PLC physical input to set the control unit safety output variable.

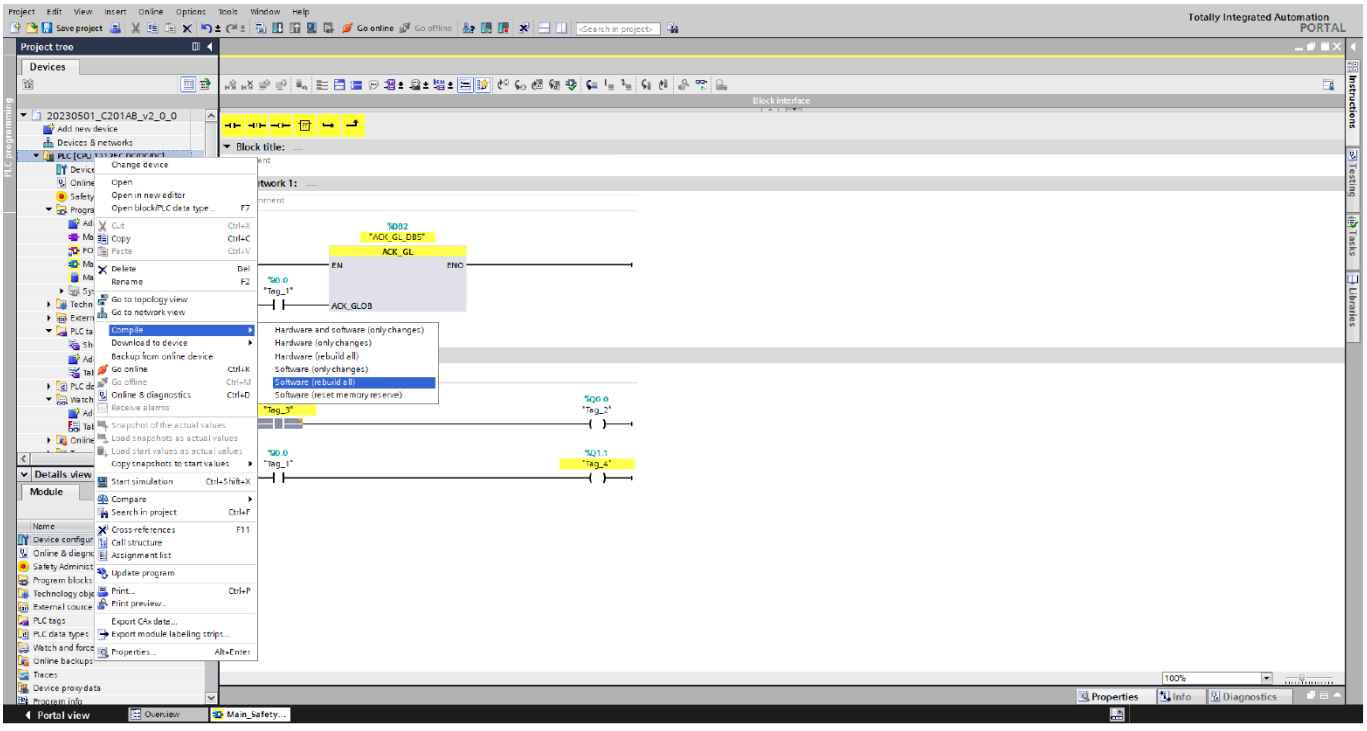


Manage the program

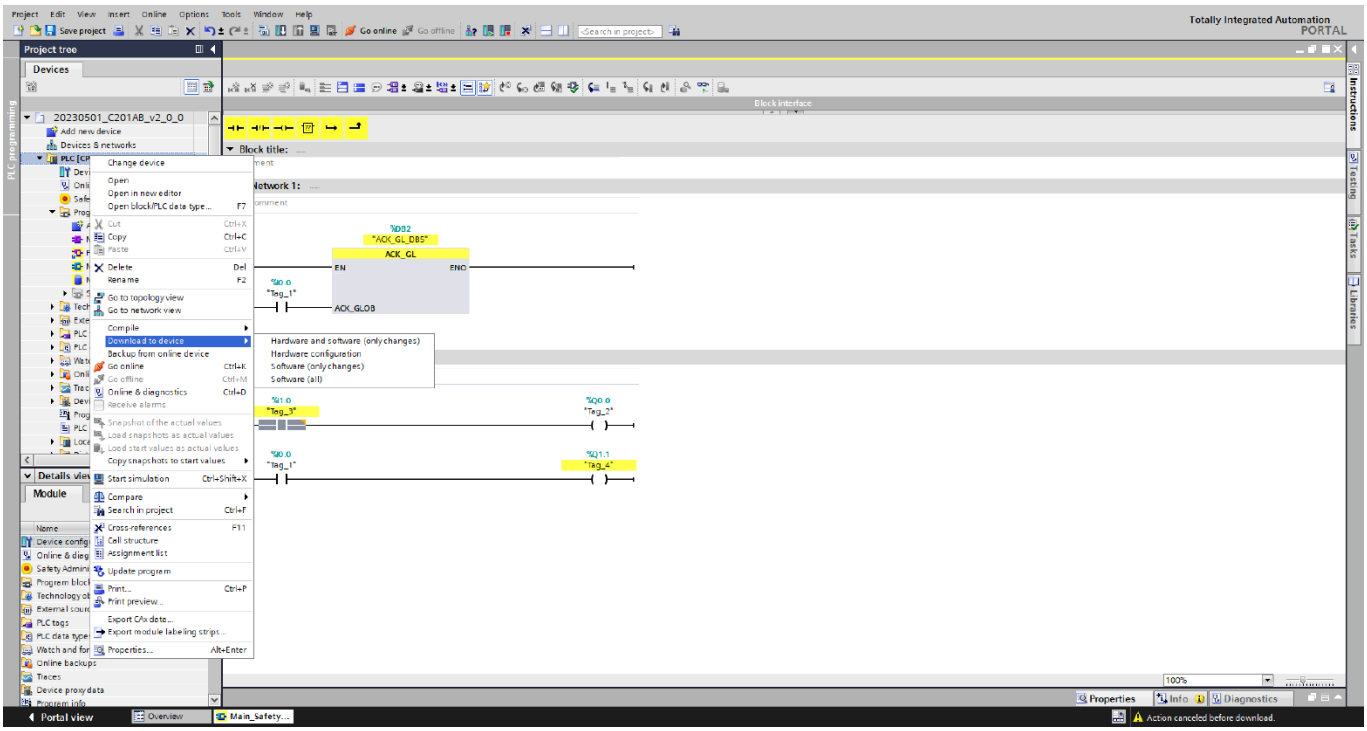
Starting from a *Main_Safety_RTG* program (Project tree > Program block), the user can drag and drop the instruction blocks into the program segment.

Above the instruction blocks the user has to insert the address or the tag of the variable.

To test the program, it is necessary to do a SW compile, by right clicking in the Project tree on *PLC > Compile > Software*.



After that, it is necessary to load the program on the PLC *(PLC > Download to device > Software)*.



Note: *a connection between the PLC and the computer on which the TIA Portal is running is needed. In the Device view form, it is possible to choose as PROFINET device also the PLC and see its properties like the IP address. This is useful to establish an Ethernet connection between PLC and computer.*

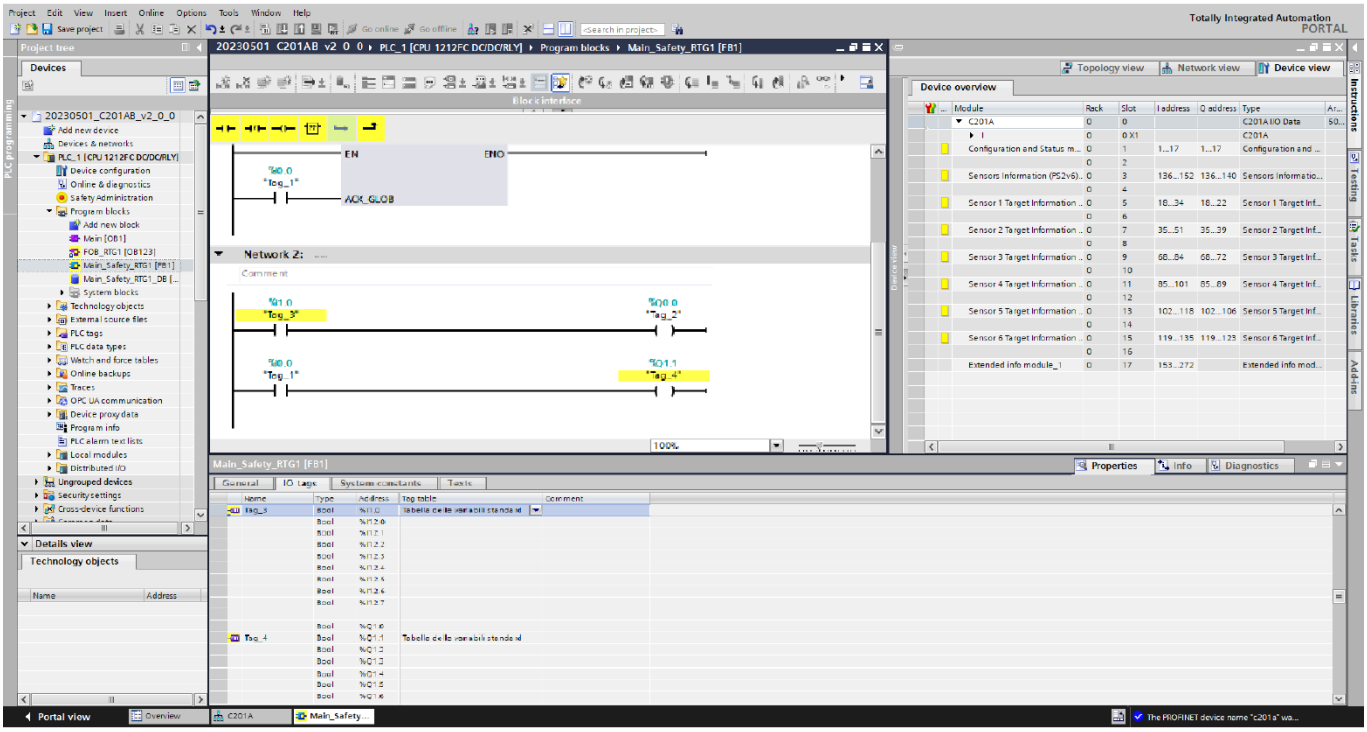
Monitoring the variables

To watch the behavior of the variables, please click on *Watch and force table (Project Tree > PLC)*.

Note: *a connection between the PLC and the computer on which the TIA Portal is running is needed. By clicking on Go online to connect the two parts and then using the Monitoring buttons, it is possible to:*

- view the variables values in the *Watch and force table*
- view the status of program block in the *Main_Safety_RTG*

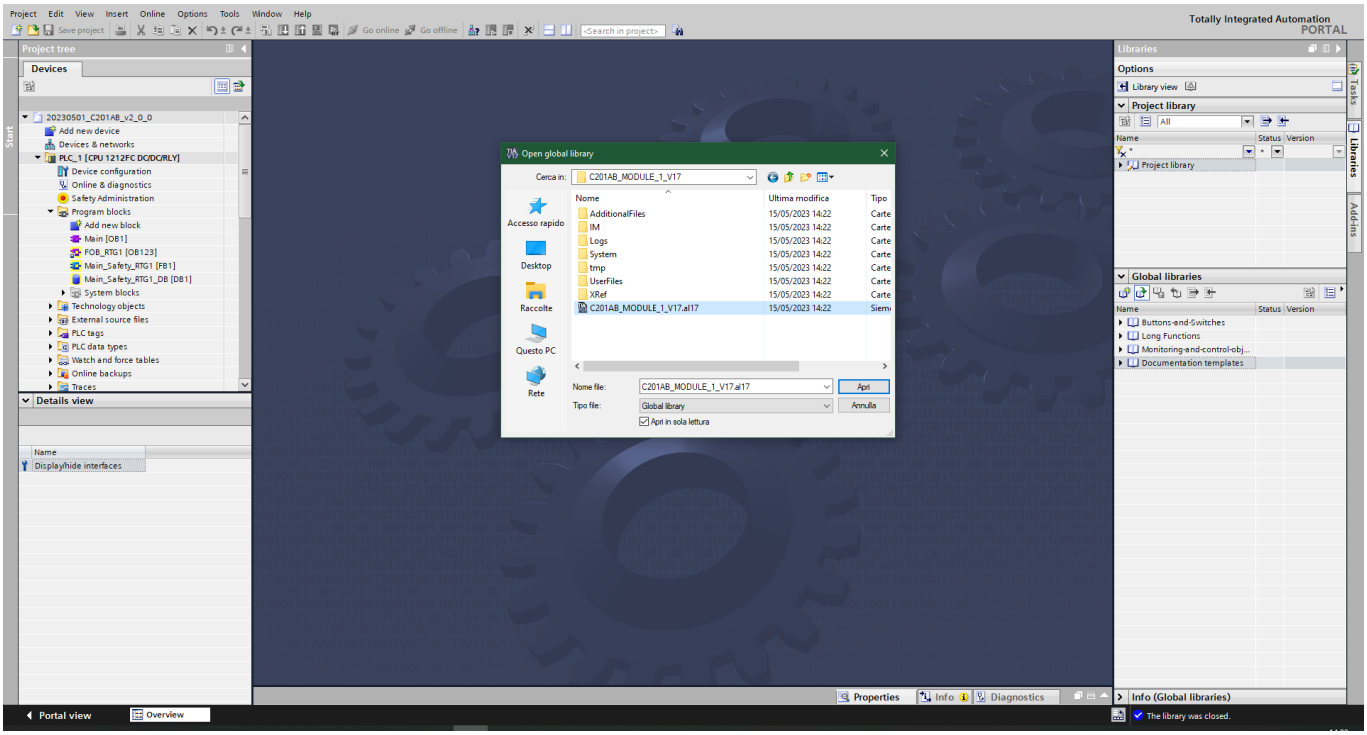
When the PLC is online, it is possible to click on *Online and diagnostics* to monitor the status of the connection and the relative errors.



7.3 Use the PROFIsafe library

The PROFIsafe library for TIA Portal is available at tools.inxpect.com.

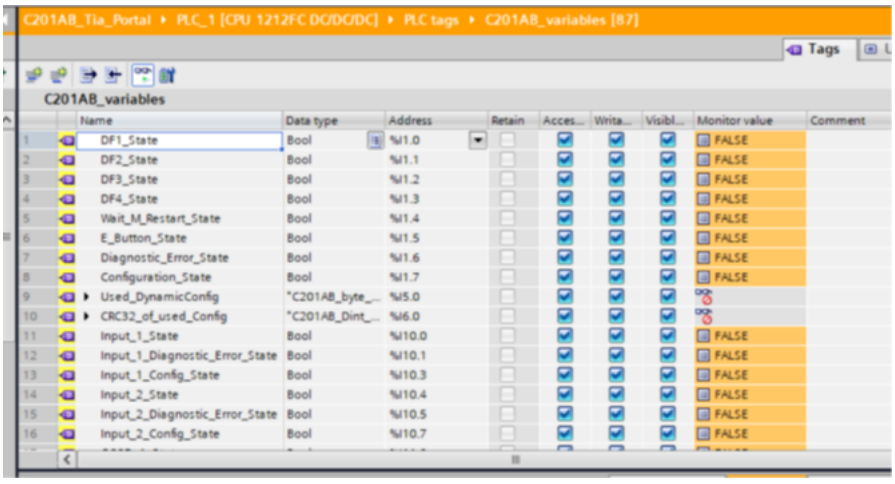
To use the library, the first step is to click on *Open global library* (menu Libraries).



7.3.1 Visualize and test the variables

To test the variables, it is necessary to compile and download the configuration to the device again.

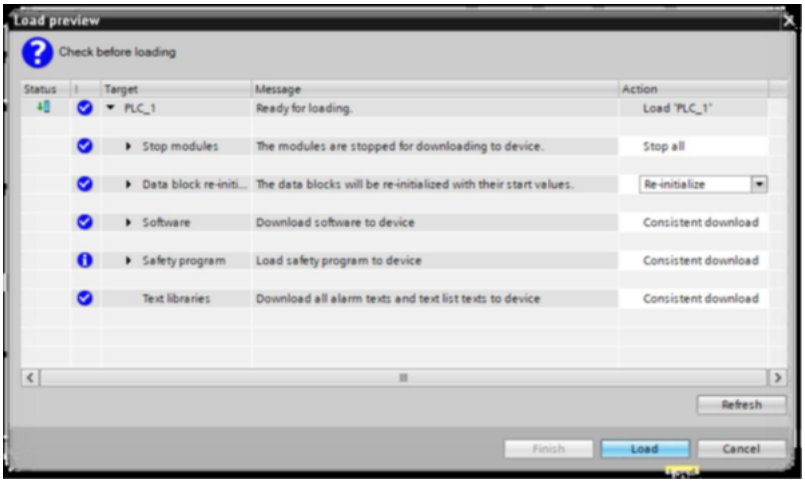
***Note**: the first time that a variable is added, it will be passivated so it will not be possible to visualize right away its value.*



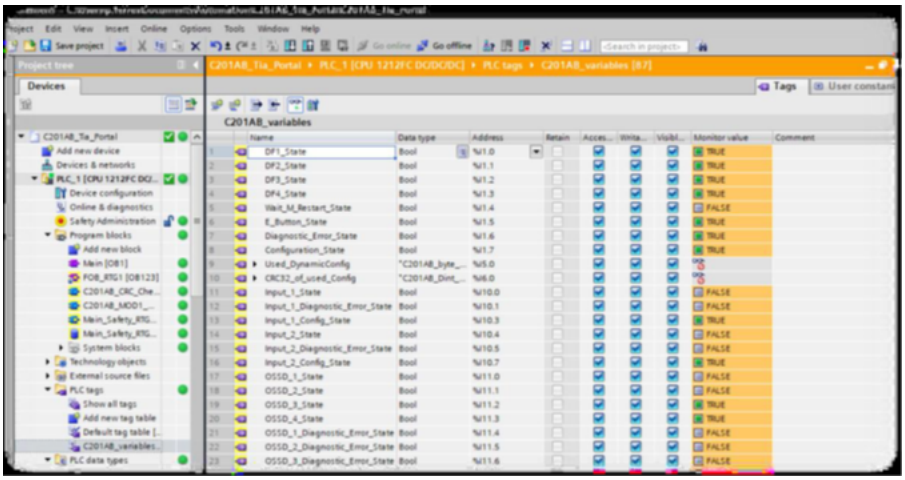
To see it, the variable should be used in an actual program (Main Safety).

Please note that the written code should be compiled and downloaded to the device to be used.

***Note**: while downloading the code, please pay attention that the Data blocks are being re-initialized with their start value.*



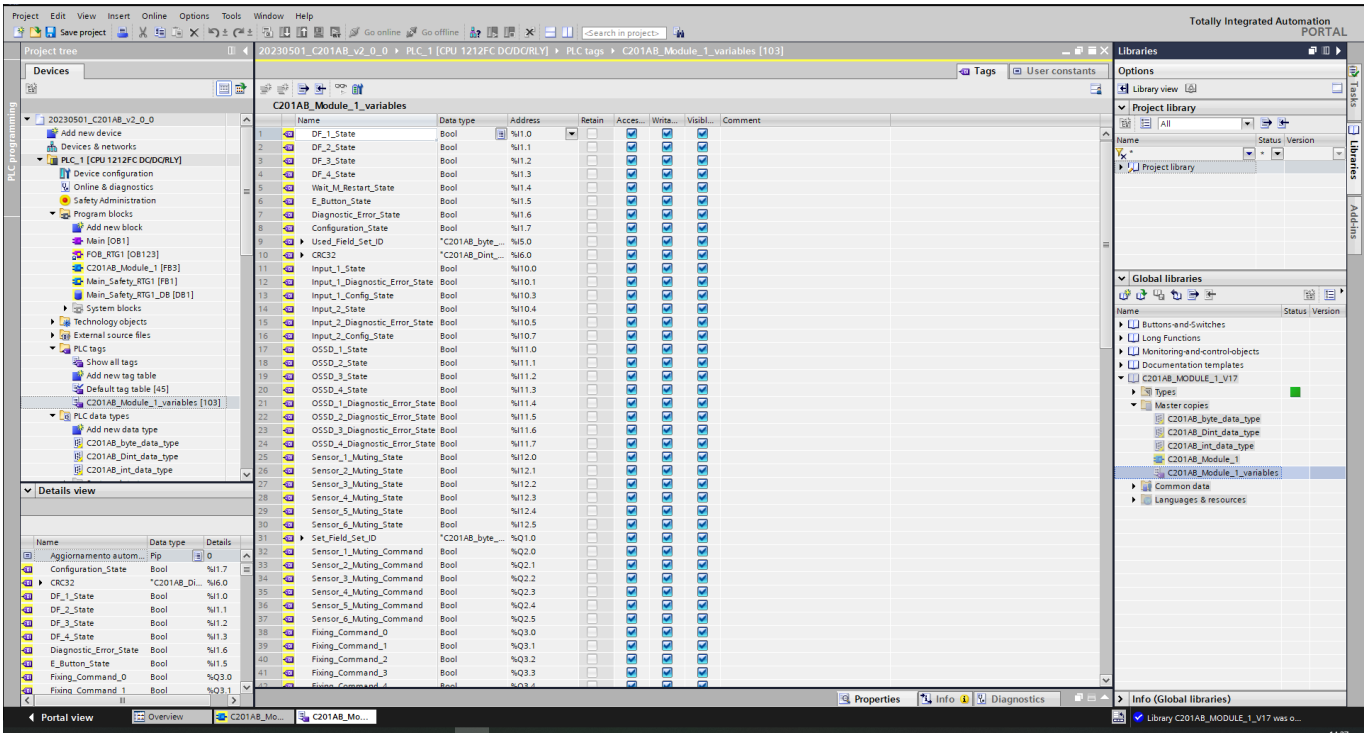
At this point, it should be possible to visualize the variables.



7.3.2 Add a library component in the PLC project

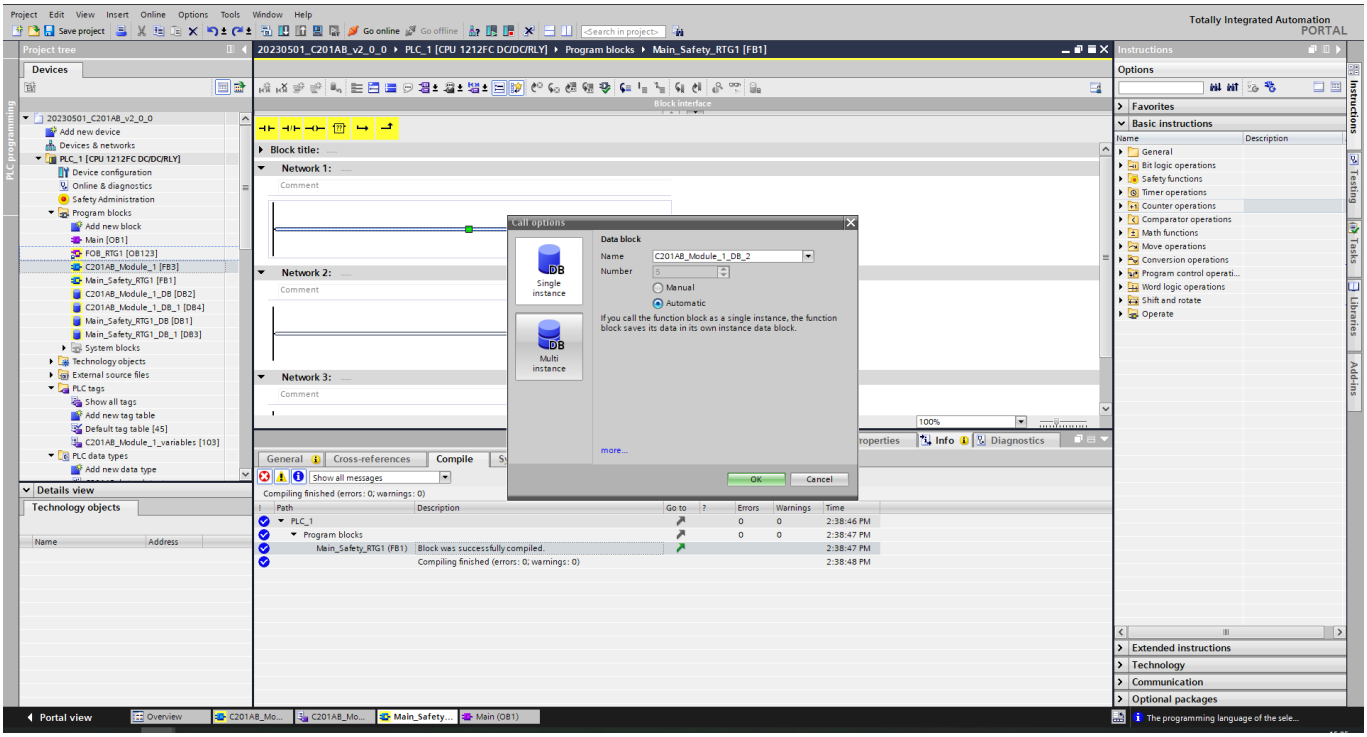
After that, users can drag and drop the *C201AB_Module* from the library menu (on the right side of the following image) to the Program Blocks folder (in the project tree).

In the same way, all the C201AB Data Types and the variables can be added respectively to the folders *PLC data types* and *PLC tags*.

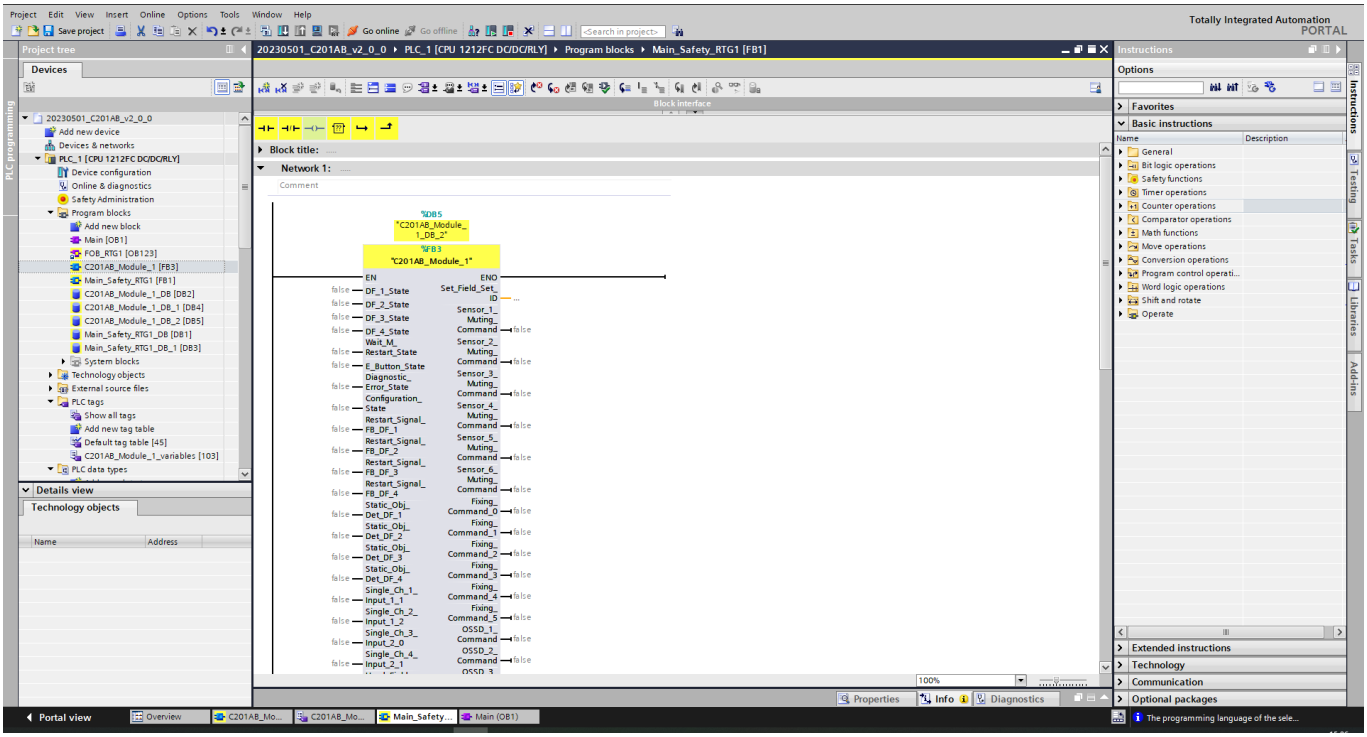


7.3.3 Add a module block in the PLC program

With a drag and drop operation, it is possible to add an C201AB Module program block in the *Main_Safety_RTG*. This operation requires the generation of a Safety Data Block (C201AB_Module_DB).



The following step will be to connect all the I/O of the C201AB Module block to the relative tags.



When all the I/O are connected, it will be possible to compile program and load it onto the PLC. While the PLC is running, all the variables of the module can be viewed in the *Watch and force table* folder.

8. Appendix A

8.1 Overview

Byte	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Control unit status	Configuration feedback	System diagnostic signal	Stop feedback signal	Restart feedback signal	Detection field 4 *	Detection field 3 *	Detection field 2	Detectionfield 1
1	Restart signal feedback	*NA*	*NA*	*NA*	*NA*	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
2	Static object detection status	*NA*	*NA*	*NA*	*NA*	Static object detection field 4 **	Static object detection field 3 **	Static object detection field 2 **	Static object detection field 1 **
3	Single channel digital inputs	*NA*	*NA*	*NA*	*NA*	Single channel 4 (Input 2.2)	Single channel 3 (Input 2.1)	Single channel 2 (Input 1.2)	Single channel 1 (Input 1.1)
4	Configuration ID currently in use	Binary value from 0 to 31							
5,6,7,8	CRC32 of the configuration ID currently in use	Signature 32-bit checksum							
9	Digital inputs	Input 2 configuration	*NA*	Input 2 diagnostic error	Input 2 logical status	Input 1 configuration	*NA*	Input 1 diagnostic error	Input 1 logical status
10	Digital outputs	Output 4 diagnostic error	Output 3 diagnostic error	Output 2 diagnostic error	Output 1 diagnostic error	Output 4 status	Output 3 status	Output 2 status	Output 1 status
11	Muting status	*NA*	*NA*	Muting status sensor 6	Muting status sensor 5	Muting status sensor 4	Muting status sensor 3	Muting status sensor 2	Muting status sensor 1

***Note**: detection in one field means that at least one connected sensor is in detection in that field.*

***Note **: available only in Inxpect SRE 200 Series.*

***Note ***: available only in Inxpect SRE 200 Series, if control unit has firmware version 1.5.0 or later.*

8.2 Meaning

Byte	Meaning
0	• 0 = " Detection* " (for bit 0, 1, 2, 3) or "Waiting for the restart signal" (for bit 4) or "Stop signal activated" (for bit 5) or "System in error" (for bit 6) or "System in configuration" (bit 7) S • 1 = "Free" (for bit 0, 1, 2, 3) or otherwise (for bit 4, 5, 6, 7)
1	• 0 = "Wating for manual restart" • 1 = otherwise

Byte	Meaning
2	• 0 = "Static object detected" • 1 = "Free"
3	• 0 = "Low" • 1 = "High"
4	-
5,6, 7,8	***Note**: byte 5 is the most significant byte (MSB), byte 8 is the least significant byte (LSB)*
9	• 0 = value "Low" (bit 0, 4) or "diagnostic OK" (bit 1, 5) or "configuration IN USE" (bit 3, 7) • 1 = value "High" (bit 0, 4) or "diagnostic ERROR" (bit 1, 5) or "not configured" (bit 3, 7)
10	• 0 = value "Off" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4, 5, 6, 7) • 1 = value "On" (bit 0, 1, 2, 3) or "diagnostic ERROR" (bit 4, 5, 6, 7)
11	• 0 = "Muted" • 1 = "Not muted"

Note *: from firmware version 1.5.0 of the control unit, Bit 0, 1, 2 and 3 have a value of 0 even when the system is in configuration, in error (fault) or if the stop signal is activated.*

9. Appendix B

9.1 Overview

Byte	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Configuration ID to be set	Binary value from 0 to 31							
1	Muting command	Group 2 muting request*	Group 1 muting request*	Muting command sensor 6	Muting command sensor 5	Muting command sensor 4	Muting command sensor 3	Muting command sensor 2	Muting command sensor 1
2	Saving anti-tampering reference**	*NA*	*NA*	*1*	*1*	1	1	1	1
3	Digital output command	*NA*	*NA*	*NA*	*NA*	Output 4	Output 3	Output 2	Output 1

Byte	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
4	Restart signal	*NA*	*NA*	*NA*	*NA*	Restart Detection field 4***	Restart Detection field 3***	Restart Detection field 2	Restart Detection field 1
5	Generic command signal	*NA*	*NA*	*NA*	*NA*	Anti-rotation reference saving****	Anti-masking reference saving****	Teach-In function signal *****	System recondition
6	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
7	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
9	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
10	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
11	Not used	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*

Note*: *available only if the control unit has firmware version 2.1.0 or later.*

Note**: *deprecated from control unit firmware version 2.0.1 (or later) and 2.1.1 (or later). Use anti-rotation and anti-masking reference bits (Byte 5 generic command signal, bits 1 and 2).*

Note***: *available only in Inxpect SRE 200 Series.*

Note***: *available only if the control unit has firmware version 2.0.1 (or later) or 2.1.1 (or later).*

Note***: *only for -WT and -WLT sensors.*

9.2 Meaning

Byte	Meaning
0	The input value is considered only if no HW input line is set as dynamic configuration selector. Depending on the configuration of the system, in case a not valid or out-of-range dynamic configuration ID is required, the current dynamic configuration ID shown in Byte 4 of the device output will be 0 and its CRC32 will be set to 0xFFFFFFFF.
1	• 0 = muting "Off" • 1 = muting "On"
2	Send the fixed value 0x3F in order to update the new anti-tampering reference.
3	• 0 = "OFF-state" • 1 = "ON-state"
4	• 0 = "Released" • 1 = "Pressed"

Byte	Meaning
5	• 0 = "Released" • 1 = "Pressed"
6,7,8, 9, 10,11	-

10. Appendix C

10.1 Overview

Byte	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Sensor 1 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
1	Sensor 1 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1
2	Sensor 2 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
3	Sensor 2 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1
4	Sensor 3 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
5	Sensor 3 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1
6	Sensor 4 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
7	Sensor 4 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1
8	Sensor 5 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
9	Sensor 5 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1

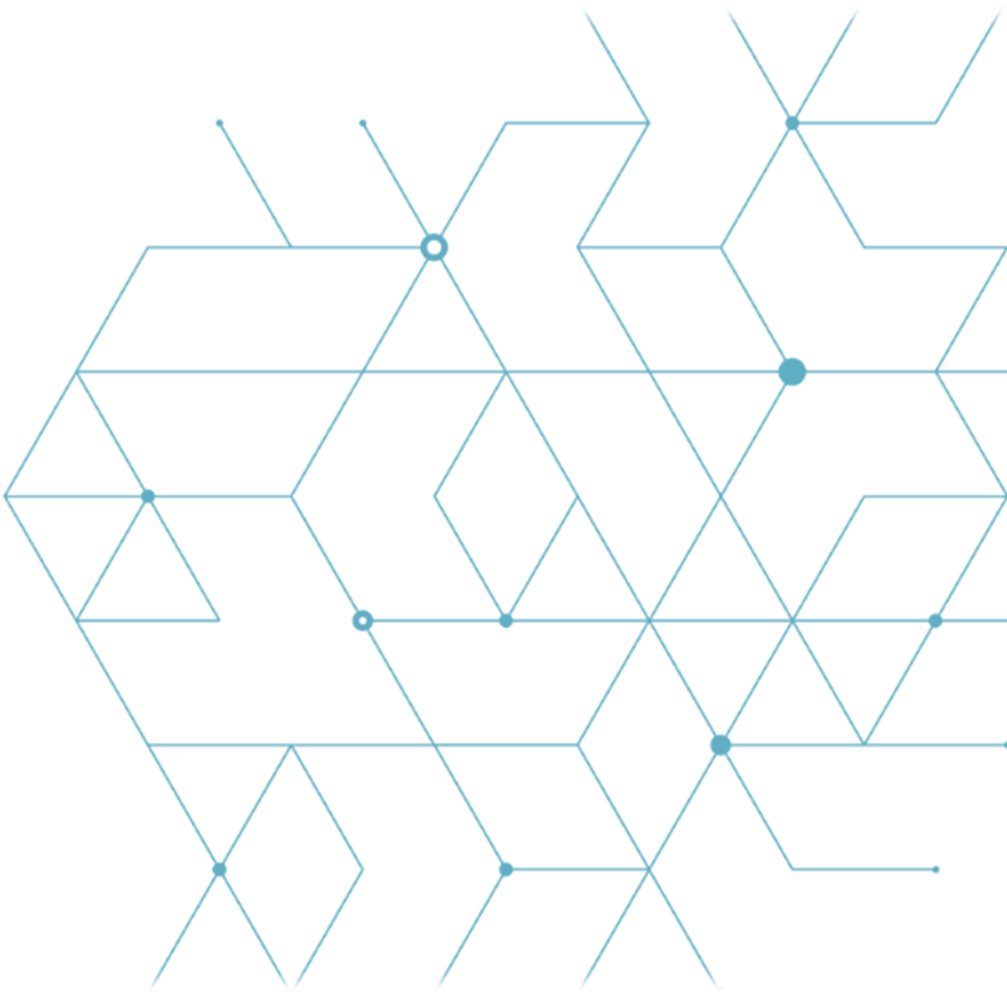
Byte	Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
10	Sensor 6 status (1 of 2)	Installation status	-	Muting feedback	Diagnostic feed-back	Detection field 4 *	Detection field 3 *	Detection field 2	Detection field 1
11	Sensor 6 status (2 of 2)	Working mode field 4	Working mode field 3	Working mode field 2	Working mode field 1	Presence field 4 *	Presence field 3 *	Presence field 2	Presence field 1

10.2 Meaning

Byte	Meaning
0	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
1	• 0 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) • 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)
2	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
3	• 00 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) • 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)
4	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
5	0 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)
6	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
7	0 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)
8	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
9	0 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)

Byte	Meaning
10	• 0 = " Detection * " (bit 0, 1, 2, 3) or "Fault" (bit 4) or "Muted" (bit 5) or "Installed" (bit 7) • 1 = "Free" (bit 0, 1, 2, 3) or "diagnostic OK" (bit 4) or otherwise (bit 5) or "Not installed" (bit 7)
11	0 = "Target present" (bit 0, 1, 2, 3) or "Restart Mode" (bit 4, 5, 6, 7) 1 = "Free" (bit 0, 1, 2, 3) or "Access Mode" (bit 4, 5, 6, 7)

Note_*: from firmware version 1.5.0 of the control unit, Bit 0, 1, 2 and 3 have a value of 0 even when the system is in configuration, in error (fault) or if the stop signal is activated.*



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