



Commissioning between SRBG AS-i and CESA-GW-AS-PB

How to commission the SRBG using CESA-GW-AS-PB
by Profibus in TIA Portal.

SRBG, CESA-GW-
AS-PB, AS-I,
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1 Requirements

Here you will find the main software and hardware used for this application note.

1.1 Software

| Type/Name | Version Software | Date of manufacture |
|--------------------|------------------|---------------------|
| Siemens TIA PORTAL | V14 | -- |

Table 1.1: Software used

1.2 Hardware



Note

Some of products are recommendation of use.

Some items has been used as suggestion in this application description. Therefore, other parts and manufacturers whose attend the required specification can be used as well.

| Doc. ID | Description/Function | Ident Code | Part Number | Manufacturer |
|---------|---|----------------------------|-------------|--------------|
| 1 | Auxiliary Power Supply ¹⁾ | CACN-3A-1-10 | 2247682 | FESTO |
| 2 | AS-I Power supply ¹⁾ | SVG-1/230VAC-ASI-5A | 547869 | FESTO |
| 3 | AS-I Bus Cable (YE) ¹⁾ | KASI-1,5-Y-100 | 18940 | FESTO |
| 4 | AS-I Auxiliary Power Cable (BL) ¹⁾ | KASI-1,5-Z-100 | 18941 | FESTO |
| 5 | PROFIBUS / AS-I gateway | CESA-GW-AS-PB | 567032 | FESTO |
| 6 | PROFIBUS Master Controller ¹⁾ | CPU 1215 DC/DC/RLY (4.3) | S7-1200 | SIEMENS |
| 6.1 | PROFIBUS Master Card | CM 1243-5 | S7-1200 | SIEMENS |
| 7 | PROFIBUS Cable ¹⁾ | 3079A.0075000 | 3079A | BELDEN |
| 8 | AS-I Sensor Box | SRBG-C1-N-1-AS-M12-M12 | 3567908 | FESTO |
| 9 | Solenoid Valve Cable ¹⁾ | NEBV-A1W3F-P-K-0.3-N-M12W3 | 3679771 | FESTO |
| 10 | Activation Element for SRBG | SASF-S2-B-F-A34 | 4046082 | FESTO |
| 11 | Solenoid Valve | VSNC-FC-M52-MD-G14-FN | 577267 | FESTO |
| 12 | Solenoid Coil | VACN-N-A1-1 | 8029144 | FESTO |
| 13 | PROFIBUS Connector | FBS-SUB-9-WS-PB-K | 533780 | FESTO |
| 14 | Ethernet Cable ¹⁾ | VS-IP20-IP20-94B-LI/5,0 | 1407903 | PHOENIX |
| 15 | AS-I Connector for SRBG | NEFU-X22F-M12G4 | 572225 | FESTO |

1) Recommendation

Table 1.2: Components Used

1.3 Documentation

This documentation intends to deliver supplementary information regarding the following documentations:

- CESA-GW-AS-PB-EN (749962):
[Search 749962 | Festo DE](#)
- SRBG-EN (8075401):
[Search 8075401 | Festo DE](#)

2 Application Description

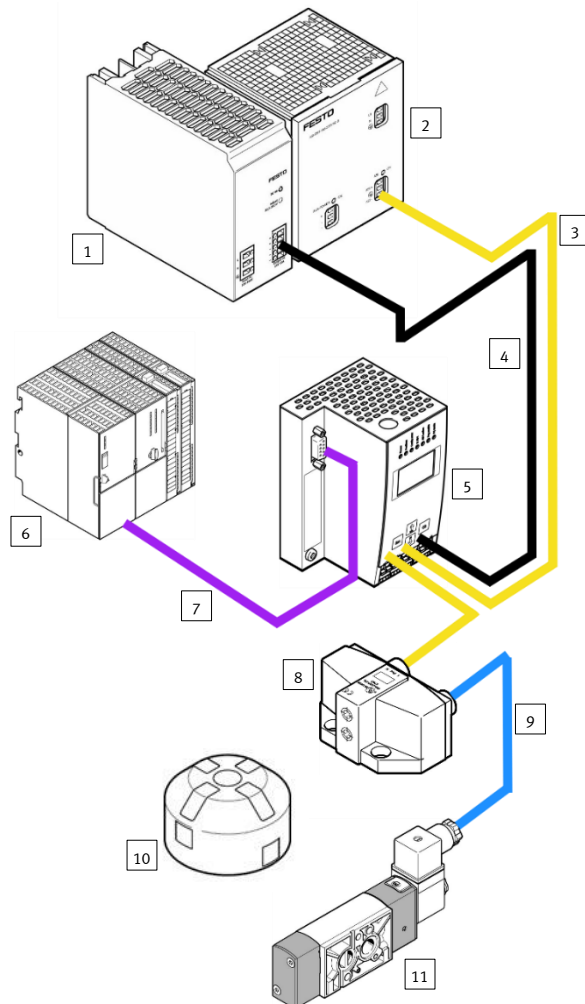
This Application note intends to show how to configure the SRBG sensorbox using our CESA-...-PB gateway for PROFIBUS.

This document as well explains how the Process Data Image works for these devices and how you can access this image using Siemens TIA Portal in your integration.

3 Installation

3.1 Hardware Setup

3.1.1 Connection Overview



- | | |
|---|----------------------------|
| 1 Auxiliary Power Supply | 7 CANOPEN network cable |
| 2 AS-i Power Supply | 8 SRBG |
| 3 AS-i Main trunk Cable | 9 Solenoid Cable |
| 4 AS-I Auxiliary Power Cable | 10 SASF Position Indicator |
| 5 CESA-...-PB Gateway | 11 VSNC Solenoid Valve |
| 6 Siemens Controller (illustrative drawing) | |

Fig. 3.1: Connection overview



Warning

This application note is entirely based in the following HW configuration as described
Any possible modification into the hardware can be consider as a possible troubleshoot step.



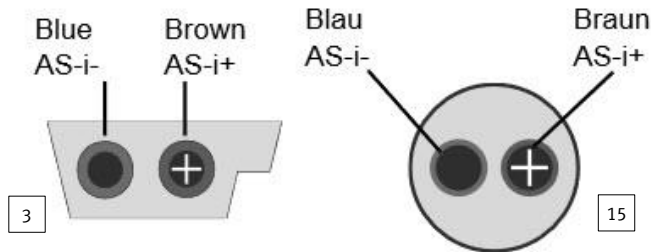
Info

Depending of the power demanding from you network, some additional power cable can be necessary

3.2 Electrical Connection

3.2.1 AS-i Cables

It is rightly recommended that you use standard AS-I cabling for this application.
The recommended cables are :



- 3 Flat Cable (to SRBG use with NEFU-X24F-M12G4 – 14)
15 2-conductor AS-i round cable (Recommended: flexible power cable H05VV-F2x1,5 per DIN VDE 0281)

Fig. 3.2: AS-i Recommended Cables

3.2.2 CESA-...-PB Connections

The CESA has 2 different places to connection where should have:

- AS-I Power Supply connection;
- PROFBUS Cable connection;
- AS-I Trunk Cable for the AS-I Slaves;

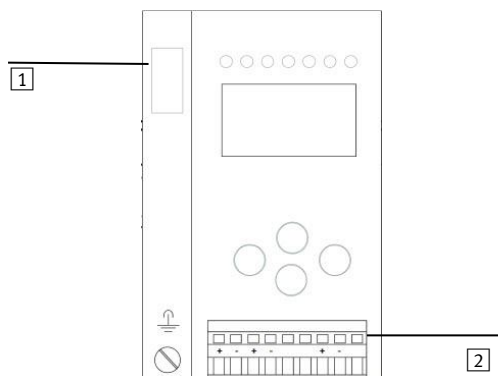


Check the manual from CESA-GW-AS-PB for details.

The connections are mentioned at → Cap.5 (Electrical Connection).

There you will find:

- Size of supported cables ;
- Electrical characteristics ;
- Connectors should you use.

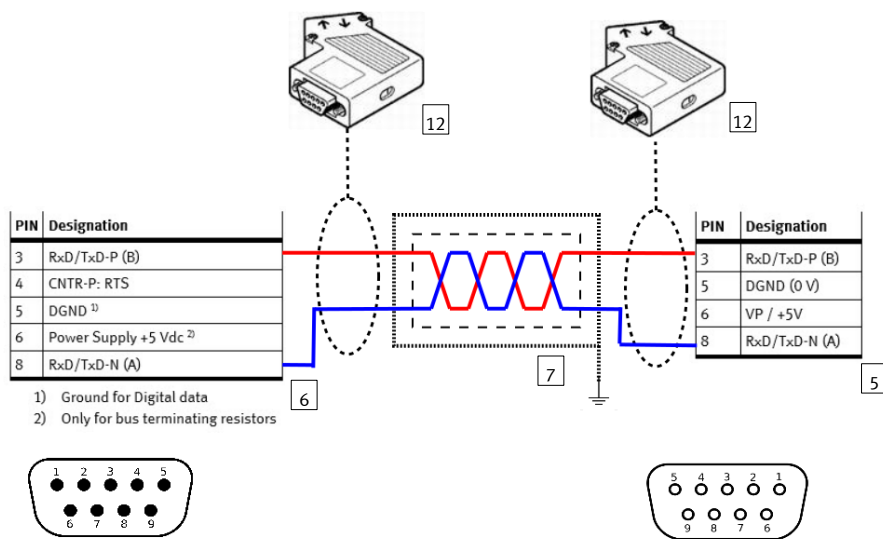


1 Connector X1 – PROFIBUS Cable

2 Connector X2 – AS-i Port Connector

Fig. 3.3: Physical connections from CESA-...-PB

3.2.3 PROFIBUS connection with CESA-...-PB



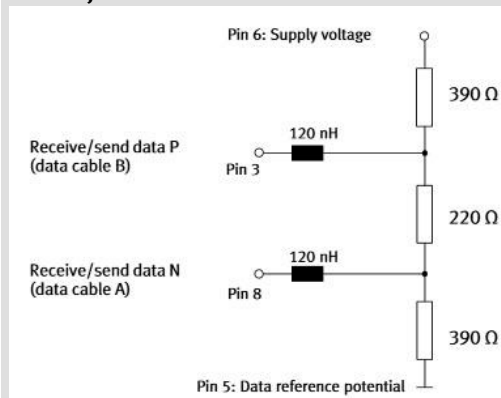
- 5 CESA-...-PB Gateway (Connector X1) 7 PROFIBUS cable
6 Siemens Controller (Master 6.1 Connector) 12 PROFIBUS connector

Fig. 3.4: Electrical Connection between CESA-...-PB and S71200 CM-1243-5



Warning

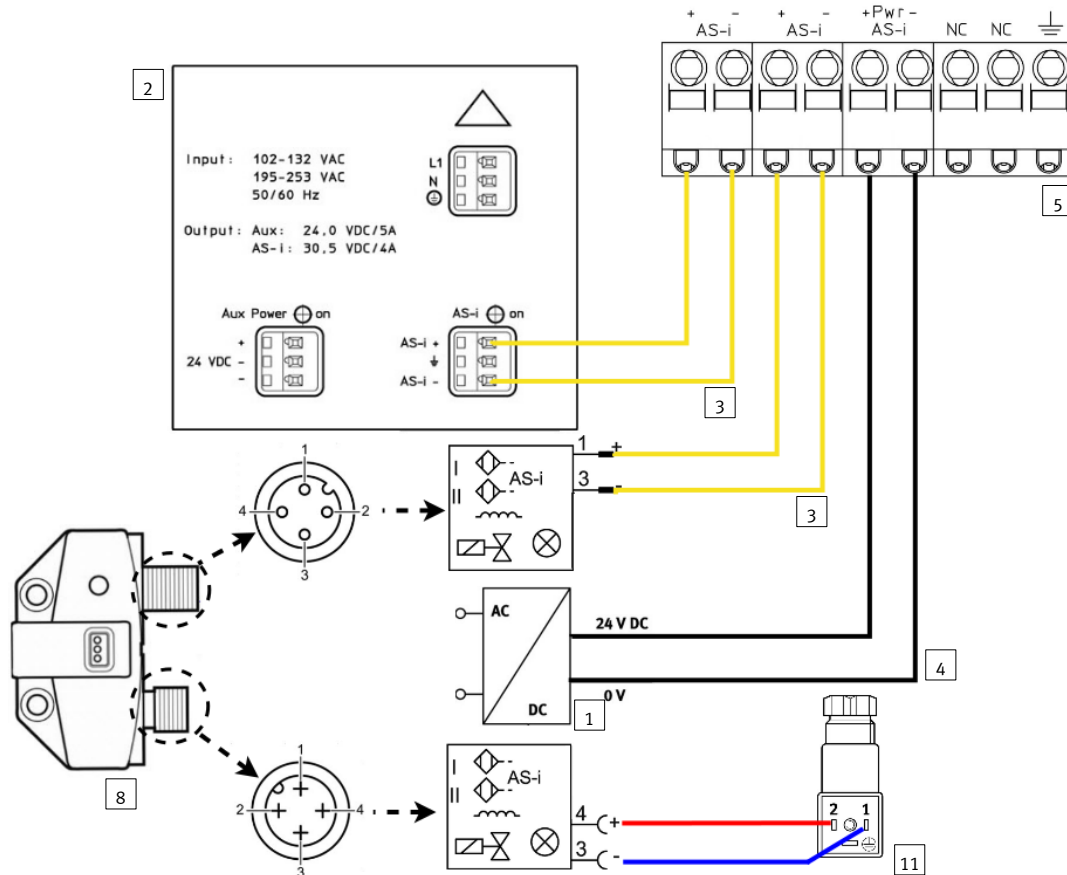
Please, check the connections for the terminal resistor on both sides.



Most of the connectors for PROFIBUS already have a switch that contains the needed resistor.

3.2.4 AS-I connection between CESA and SRBG

Here you find how to connect your AS-I system between your SRBG and CESA :



- | | |
|--------------------------|------------------------------------|
| 1 Auxiliary Power Supply | 4 AS-I Auxiliary Power Cable |
| 2 AS-i Power Supply | 5 CESA-...-PB Gateway Connector X2 |
| 3 AS-i Main trunk Cable | 8 SRBG : AS-I and Valve Connection |
| 11 VSNC coil connector | |

Fig. 3.5: Electrical Connection – AS-i network with External Power Supply

4 Commissioning

4.1 CESA-...-PB configuration

This chapter brings more knowledge about the configuration that needs to be done inside of CESA in order to have the AS-I working properly.



Note

This is a complementary documentation.

For more information about the CESA-GW-AS-PB and other configurations with the advanced display mode you find at the CESA-GW-AS-PB manual → Cap. 6 (Operation in Advanced display mode).

4.1.1 Using function „Quick Setup“ for AS-i Configuration

This function allows your network to be configured automatically based on the actual network state and which devices you have.

The CESA will overwrite all the addresses in order to have an optimized use form the available memory and the components that you have in the network to his internal project.

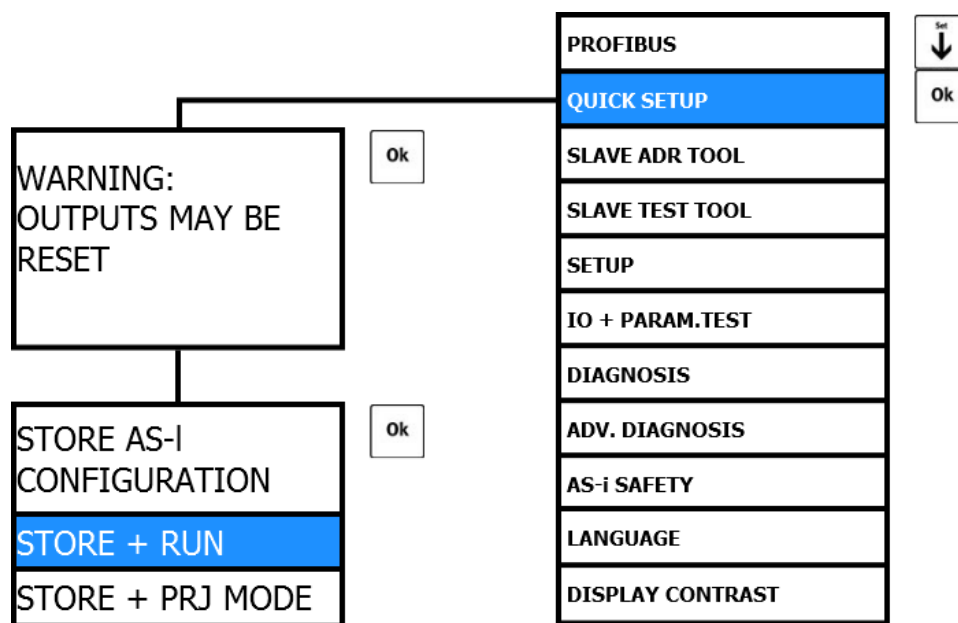


Fig. 4.1: Sequence in the “Advanced Display Mode” in CESA – Quick Setup



Warning

This procedure will overwrite all the addresses from your slaves !

If you already have an existent AS-I network and you want to add some device, be advise that using this procedure may your network experience wrong assignments for the existent devices.

4.1.2 Checking the AS-i Network

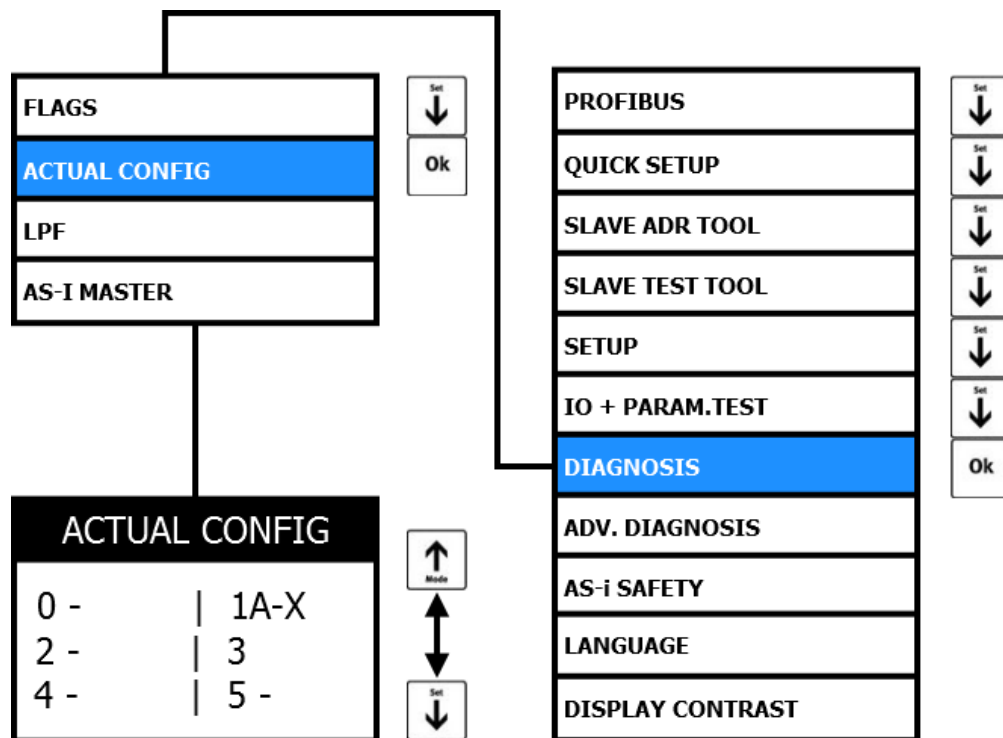


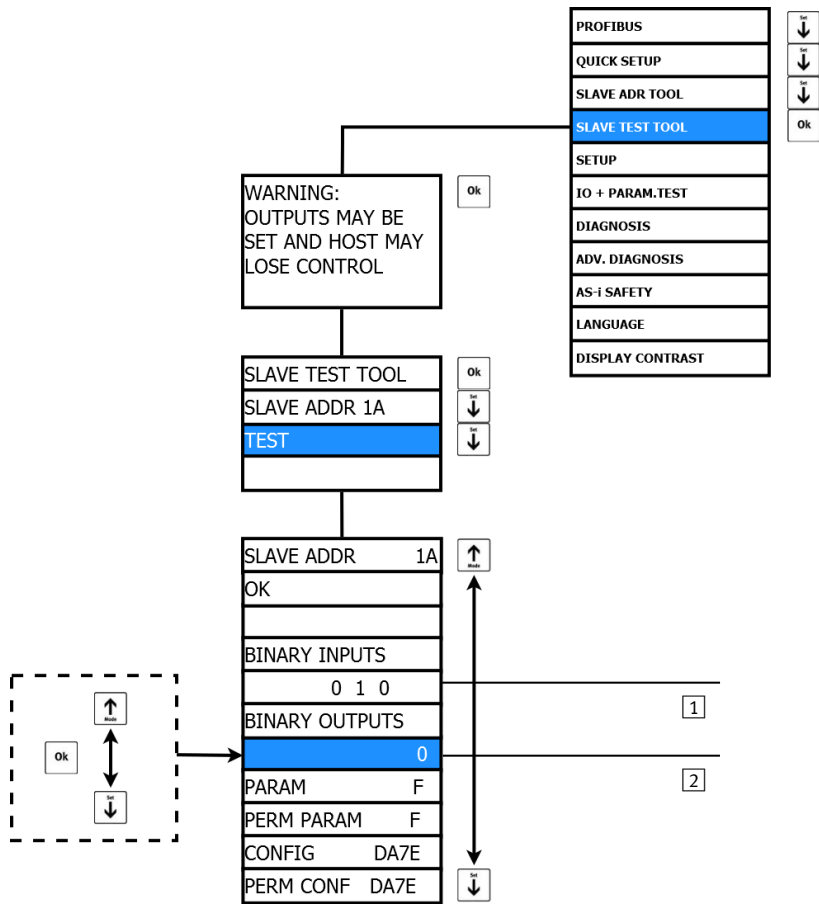
Fig. 4.2: Sequence in the "Advanced Display Mode" in CESA – Actual Configuration

In the "actual config" screen you can scroll up and down and see what are the existent configured devices and their status.

| On Screen | Status | Description |
|-----------|--------------------------|--|
| X | OK | The configuration data for the detected AS-i slave complian with the designed configuration. |
| D | Detected Only | An AS-i slave has been detected at this address, but it was not designed in the project. |
| P | Projected Only | An AS-i Slave has been configured for this address, but it was not detected. |
| C | Type Conflict | The configuration data for the detected AS-i has no compliance with the designed configuration data. The actual existing configuration of the connected data will be shown. |
| F | Peripheral Fault | The AS-i Slave has a diagnosis . |
| A | Duplicate Address | Two or more devices have the same address. |

Table 4.1: Possible Diagnosis at "Actual Configuration" in CESA

4.1.3 I/O Device Monitoring and Forcing



- 1 Binary Inputs from SRBG
- 2 Binary Output from SRBG

Fig. 4.3: Sequence in the “Advanced Display Mode” in CESA – Monitoring & Forcing I/O’s

4.1.4 PROFIBUSS Address

For this application, we are using Node ID 3:

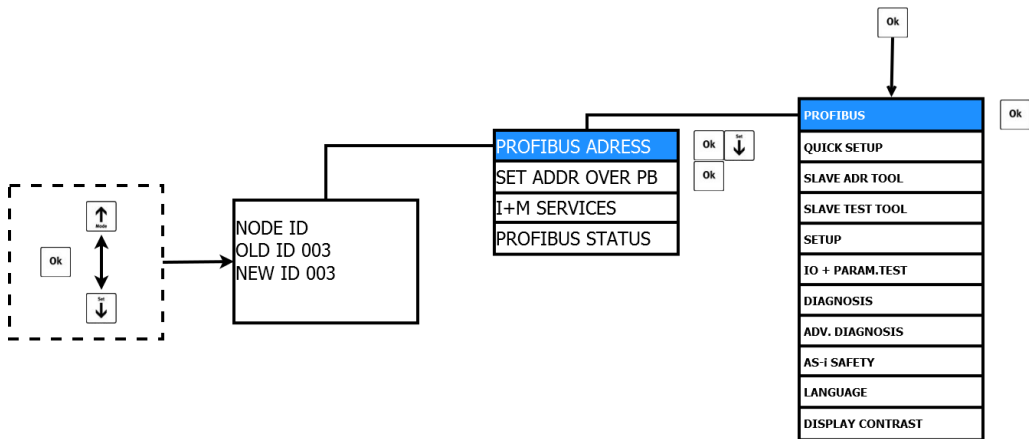


Fig. 4.4: Sequence in the “Advanced Display Mode” in CESA – PROFIBUS address

4.2 Siemens

In this part of the application note, we will provide a basic configuration to access the variables into your SIEMENS S7-1200 PLC with PROFIBUS master enabled.

4.2.1 Accessible variables

The variables that can be access through the process data are mentioned as follow:

| Function | Access (R/W) | Description |
|-------------------------|--------------|--|
| Switch Output Sensor 1 | Read | Returns the activation from the first sensor of the SRBG. |
| Switch Output Sensor 2 | Read | Returns the activation from the second sensor of the SRBG. |
| Valve Error | Read | Returns if the valve has short circuit or wire break. |
| SRBG connected | Read | Check if the connection with the SRBG exists. |
| Valve Output activation | Write | Activates the output from the valve. |

Table 4.2: Possible variables from the SRBG



Check the manual from SRBG for details.

The possible data mentioned is at → Cap.4.2 (Electrical).

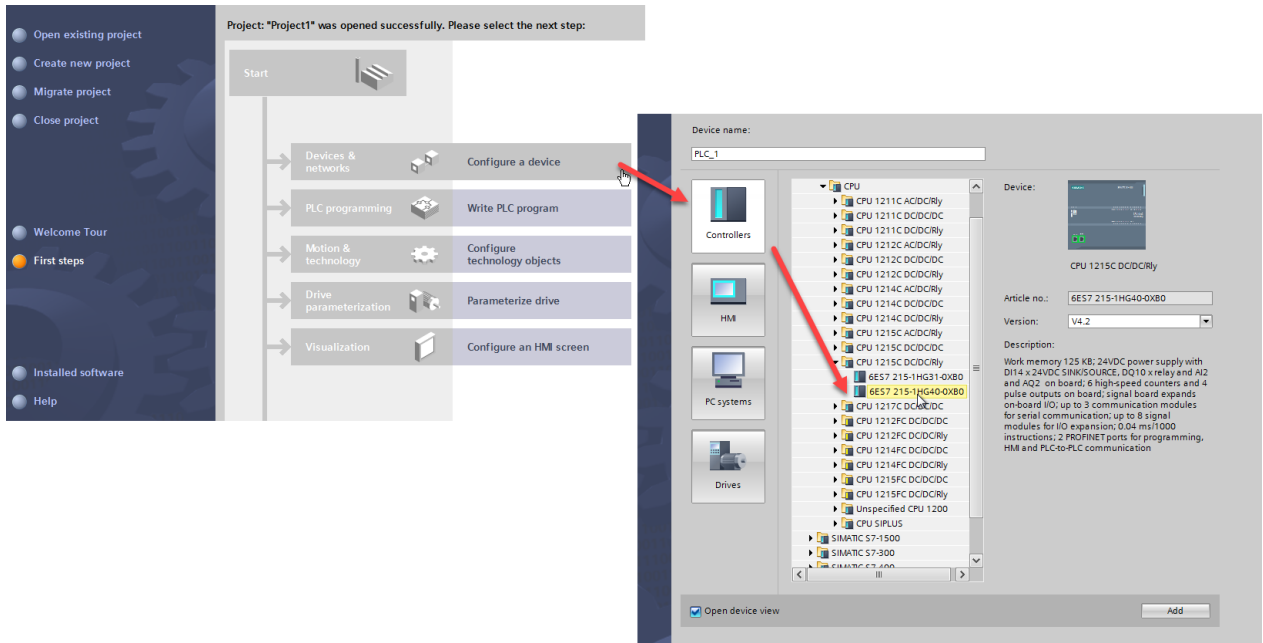
There you will find also:

- Parameters from the Identification Code;
- Parameters from switching elements and watchdog.

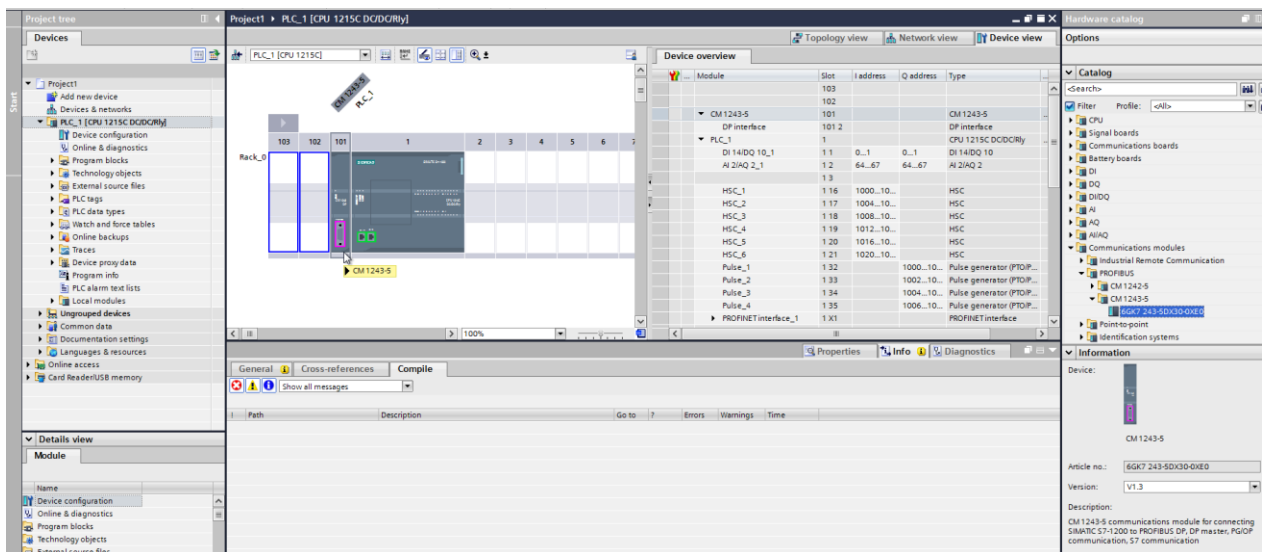
This parameters are accessible by the CESA interface.

4.2.2 Inserting new CESA-...-PB Device into S7 Project

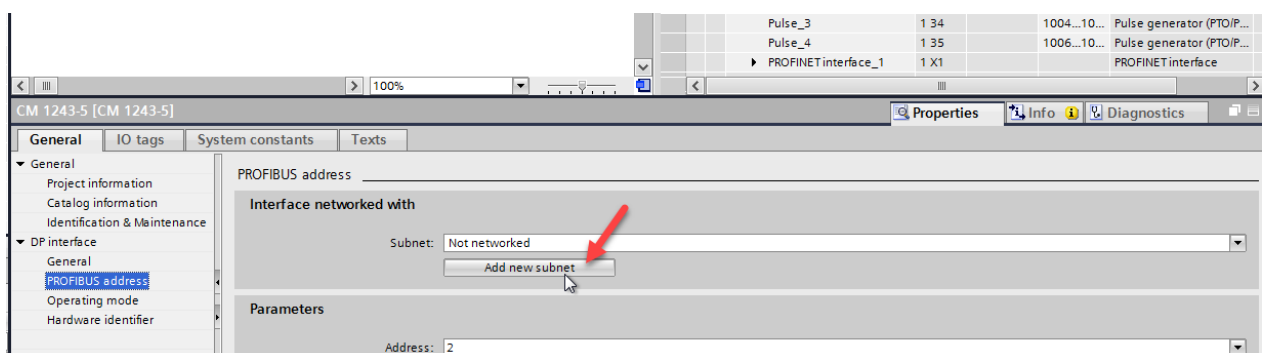
- Open a new Project in the TIA portal and add a S7-1200 System;



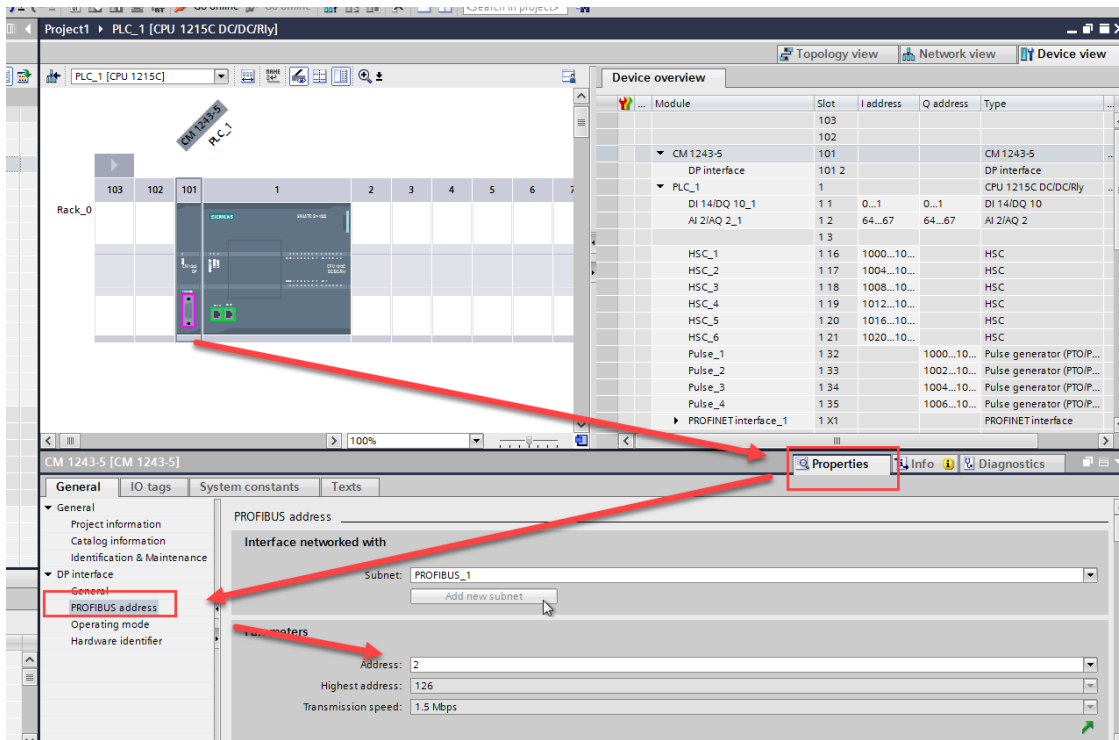
- At project tree , select Device View and Add your PROFIBUS Module;



- Select your PROFIBUS card , go to "Properties" and Select "PROFIBUS Address"
- Click on "Add Subnet" and the TIA Portal will set up you new network with the card as master;



- Therefore, you can change the parameters from your PROFIBUS Master as well;

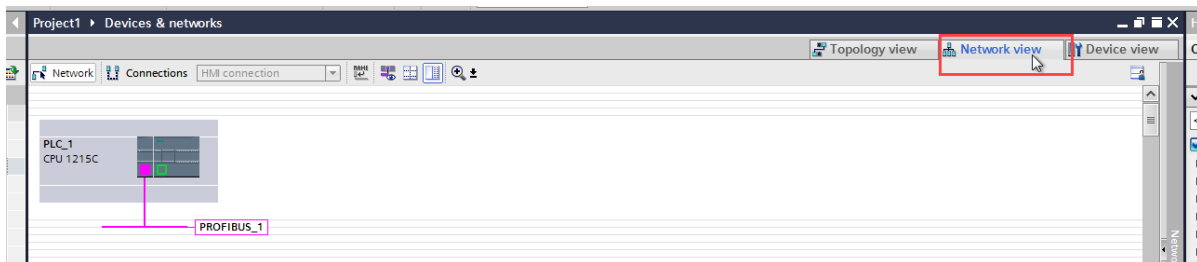


Warning

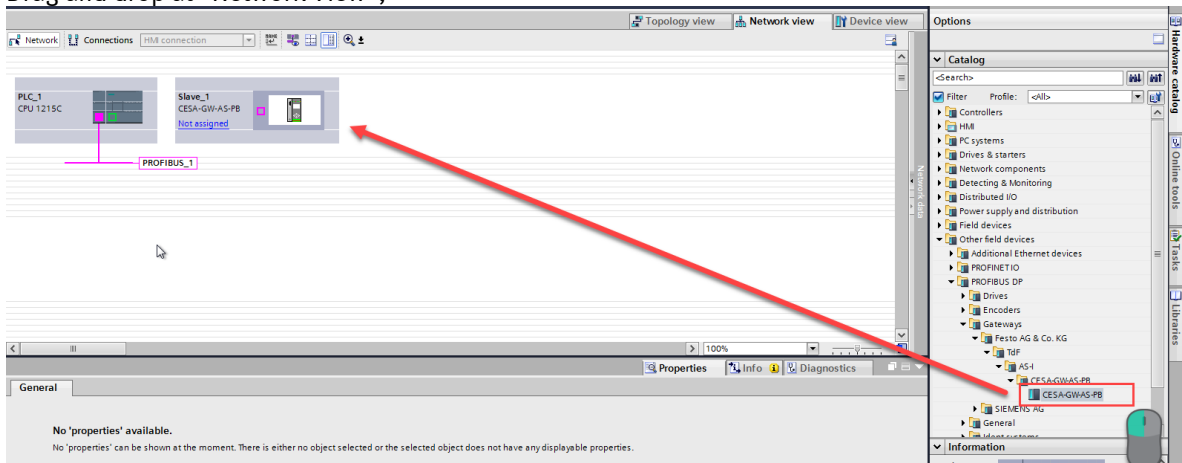
Your Address at the CESA-...-PB should not be the same.

You have to assign different addresses for each device at the Network.

- Go to “Network View” and you will see your preset PROFIBUS network ready to deploy;

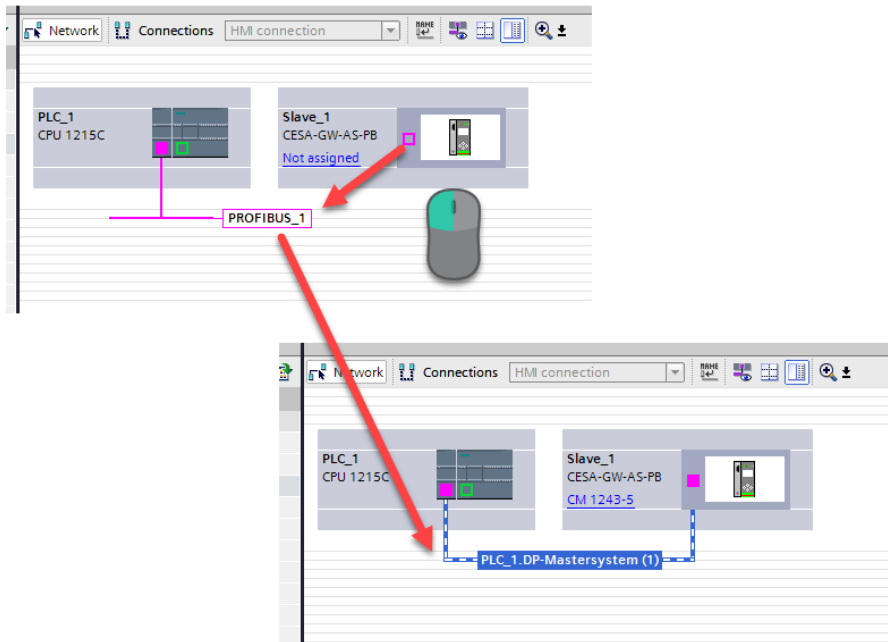


- Then, search for CESA-GW-AS-PB at “Hardware Catalog”;
- Drag and drop at “Network View”;

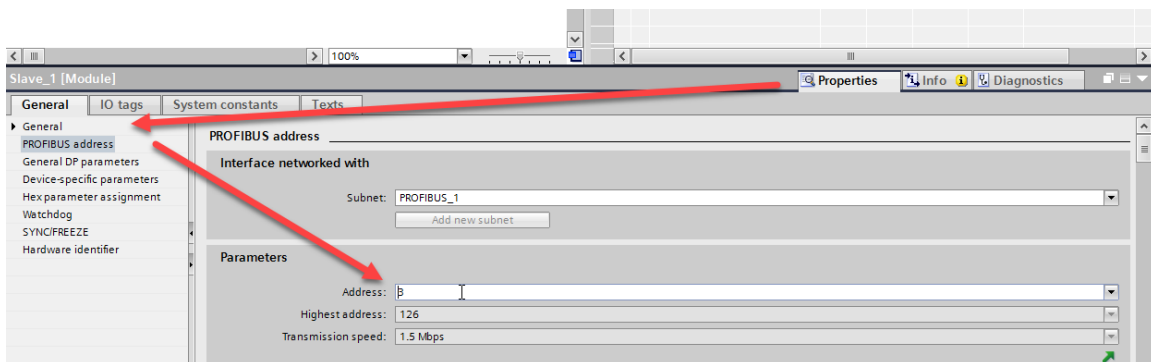


4.2.3 Configuration for PROFIBUS at S7-1200

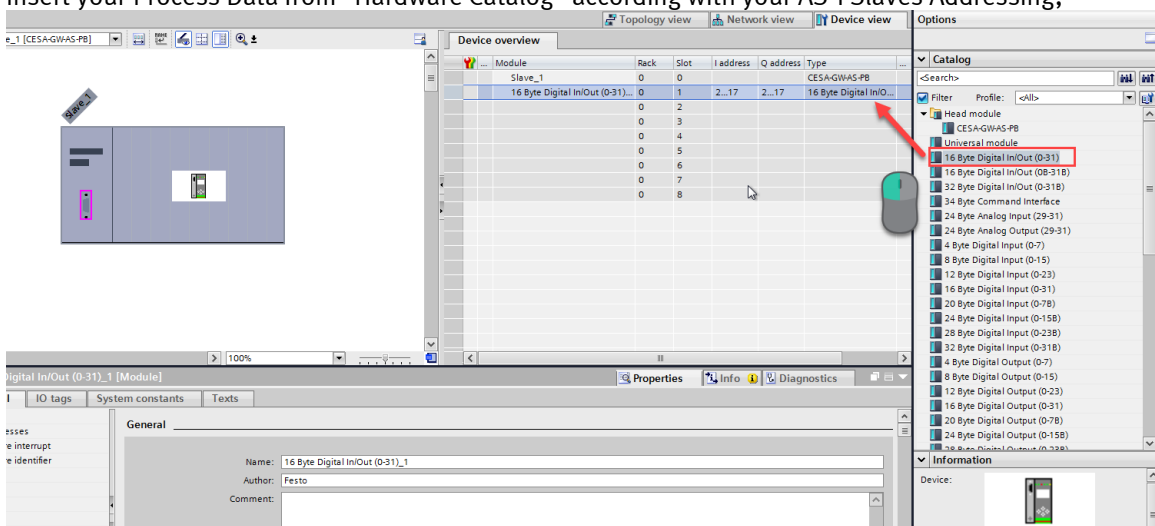
- At “Network View” Drag and Drop the CESA-...-PB PROFIBUS port into the Network to assign it as a slave ;



- To change the Address from the Slave, select “Properties” and check “PROFIBUS Address” Tab;

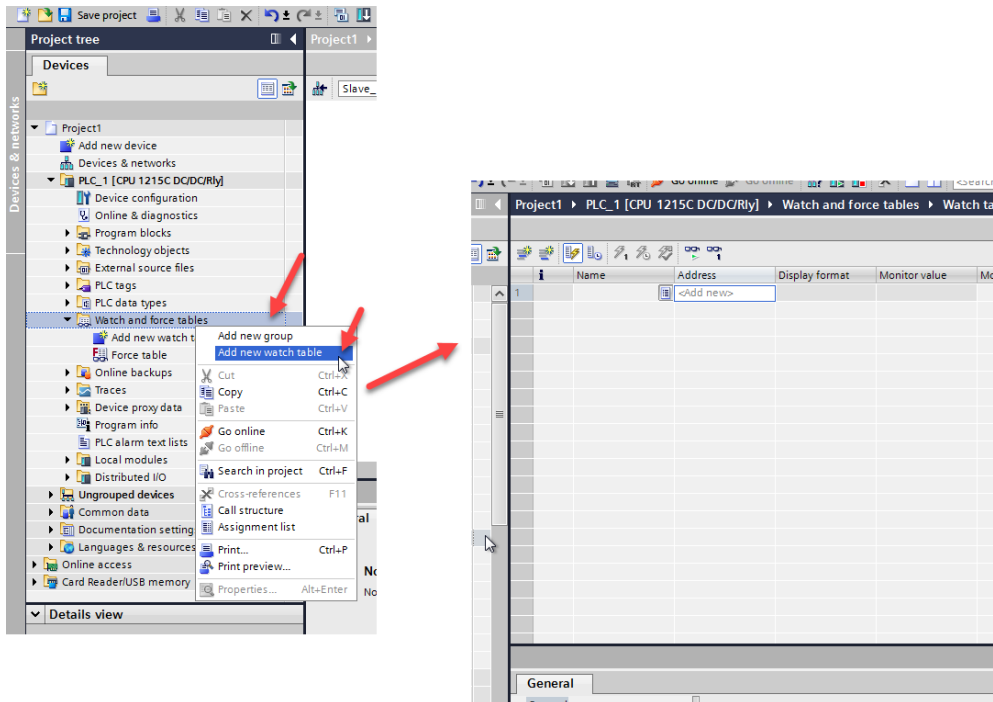


- Double Click at your Slave;
- Insert your Process Data from “Hardware Catalog” according with your AS-I Slaves Addressing;

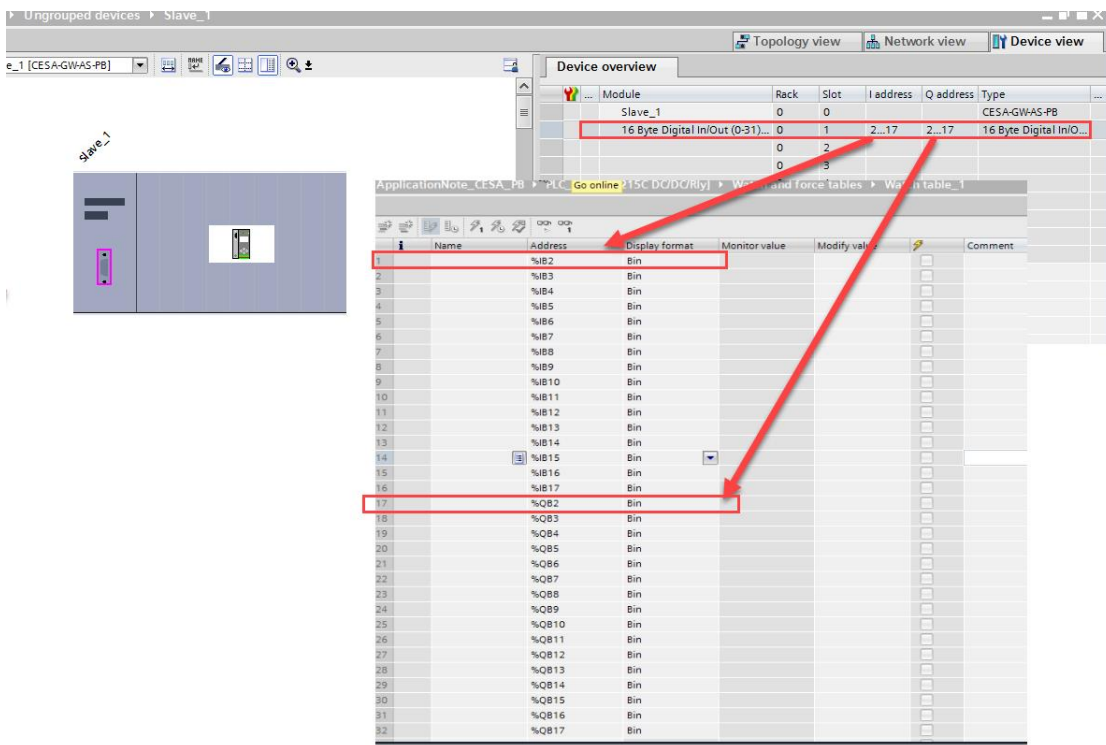


4.2.4 Watch table

- At “Project Tree”, right click on “Watch and Force Tables” → “Add new watch table”;



- Mount the Table as described below, based on your address that you can collect at “Device View” in your CESA-GW-AS-PB Slave;



4.2.5 Process Image

Looking at the Watch table that you create, this is how the process image should look like:

| Address | Channel | Description |
|---------------|----------------------------------|-----------------|
| %QB2 - %QB9 | Digital Output Slave 1(A)-15(A) | Devices Outputs |
| %QB10 - %QB17 | Digital Output Slave 16(A)-31(A) | |
| %IB2 - %IB9 | Digital Input Slave 1(A)-15(A) | Devices Inputs |
| %IB10 - %IB17 | Digital Input Slave 16(A)-31(A) | |

Table 4.3: Addressing at CoDeSys from CESA.



Extended Addressing is not used in this application.

If you need a better understanding about this configuration, please check → Cap. 6.8.7 (AS-I Address assistant) in the CESA Manual.

You can use for the Extended addressing other options in “Hardware Catalog” at the

The SRBG will be mapped as follow:

| VARIABLE | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 |
|----------|--------------------------|-------|-------|-------|-------------------------|------------------------|-------------|----------------------------------|
| %IB2 | CESA Flags for Diagnosis | | | | Slave Address 1 Inputs | | | |
| | | | | | Switch Output Sensor 2 | Switch Output Sensor 1 | Valve Error | Hi-Flag from Slave ¹⁾ |
| %IB3 | Slave Address 3 Inputs | | | | Slave Address 2 Inputs | | | |
| %QB2 | CESA Flags for Diagnosis | | | | Slave Address 1 Outputs | | | |
| | | | | | | | | Valve Output |
| %QB3 | Slave Address 3 Outputs | | | | Slave Address 2 Outputs | | | |

1) Acknowledges that the equipment is Alive (when connected, Always on)

Table 4.4: SRBG Mapping



Info

The diagnosis (bit 4-7) are just in the first byte and then, for the next address, the following bytes are sequential for all the address, allocating 1 nibble (4bits) for each slave.