IMI NORGREN

Valve island VS18/VS26 with PROFINET Interface

Engineering GREAT Solutions

Operation & Service Manual

IMI Precision Engineering

Change history:

The Change history reflects all changes of the Operation & Service Manual, which were done after the initial release.

Index	Chapter	Change description	Date	Name
001	All	Set up initial version	27/03/2017	
002	2	New chapter added	31/05/2017	
003	2.3, 9	ISEM description added, valve island extension added	03/11/2017	
004	2.4	Max. number of valve slices for ATEX valve islands added	04/12/2017	
005	2, 4.6, 9.1, 9.11, 11.2, 11.3	Power-up description updated, ATEX Note added, Mounting kit added, FW version and serial number added, New 2 station SPI board added, soft start valve rules added, technical data corrected	13/09/2018	

This Operation & Service Manual makes no claims of being complete as it does not cover all variants of the VS18/VS26 valve islands series at the moment.

Therefore this document is subject to extensions or changes.

Content

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1 About this documentation

This Operation & Service Manual contains the information to set up and operate the VS18/VS26 valve island with PROFINET interface and to detect and resolve problems.

Note:
In addition to the specific information for the PROFINET variants, all data sheets for the VS18/VS26 valve island series are applicable and remain valid. The difference between the both variants consists of the sizes of valves and the resulting maximum flow rate. All electrical connections and parameterization are the same for both variants.

Refer also to the data sheets on the following web links:

- *http://cdn.norgren.com/pdf/en_5_1_250_VS18.pdf*
- *http://cdn.norgren.com/pdf/en_5_1_350_VS26.pdf*

Refer also to the installation video on the following web link:

- *https://player.vimeo.com/video/256919181*

Further information about PROFINET is available on PI website.

- *http://www.profinet.com*
- *http://www.profibus.com/download/*

Basic information about PROFINET could be found in the following document:

- *“PROFINET Technology and Application – System”*

Installation Guidelines could be found in the following documents:

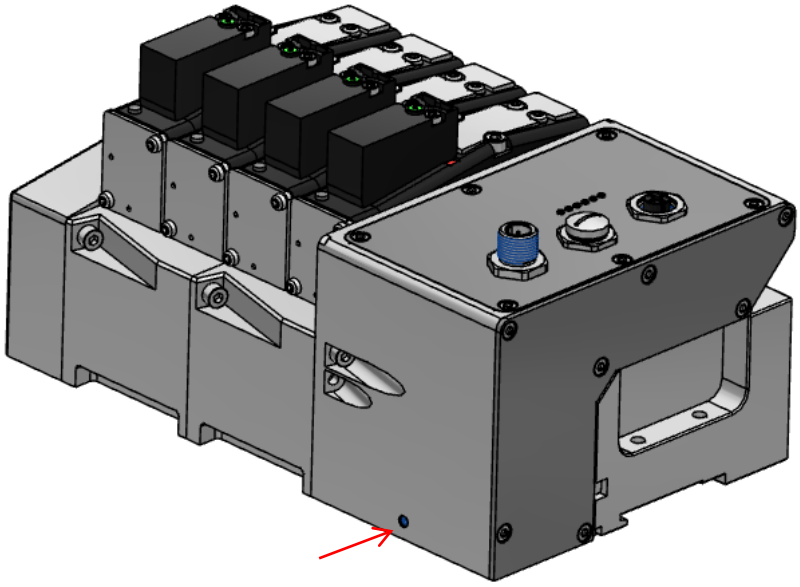
- *“PROFINET Guideline for Cabling and Assembly”*
- *“PROFINET Guideline for Commissioning”*

2 Important hints

2.1 Grounding and equipotential bonding

Proper grounding and equipotential bonding are very important to protect against electromagnetic interferences in PROFINET networks. In order to reduce potential impact, grounding of the PROFINET cable screen should be done at both ends of every cable (i.e. at each device). Equipotential bonding ensures that the ground potential is identical throughout the entire PROFINET network and is essential to avoid equipotential bonding currents, which could otherwise flow through the PROFINET cable screen. Please refer for further details to the “PROFINET Installation Guideline for Cabling and Assembly” provided by the PROFINET user organization (http://www.profinet.com).

Ground connection needs to be established using the M4 thread on the rear of the connection module. Its location shows the red arrow on the following picture.



2.2 Intermediate supply/exhaust module (ISEM)

In cases where the channel diagnostics is activated on the valve island, the channel diagnostics setting should be disabled at the position of each ISEM. This needs to be done in order to avoid any misleading failure indication due to missing electronic components in the ISEM.

2.3 ATEX Note

Please refer to the corresponding ATEX installation instructions and the maximum permissible operating conditions for valve islands in an ATEX zone.

The maximum allowed power consumption is 20W. This corresponds to 16 simultaneously energized pilot valves. If a configuration consists of more than 16 pilot valves the user must undertake external actions (e.g. power-limited power supplies) to make sure that the power consumption of 20W is not exceeded.

For further details, please refer to the corresponding ATEX installation instructions or contact your Technical Support.

2.4 Power-up and initialization phase of the VS18/VS26 valve island

It is possible to read the actual installed firmware release using the TIA portal. Please refer to chapter 4.6 for more details.

2.4.1 Firmware release V1.0.10 and lower

The valve island initializes automatically after power-up. During initialization the number of available valve stations is also evaluated, which requires that at this point also the power supply for the valves (VA) is already available during initialization start. Otherwise not all valve stations might be detected and initialization of the valve island fails. This failure case is indicated by the following permanent Status LED states:

- *P1 – off*
- *P2 – off*
- *BF – off*
- *SF – red*
- *VB – green*
- *VA – Green*

2.4.2 Firmware release V1.0.11 and higher

The above requirement is not applicable for the firmware release V1.0.11 and higher.

Note:

Before any changes are made on the hardware of the valve islands (i.e. adding or removing valve stations), the power supply must be completely disconnected by unplugging the power supply connector.

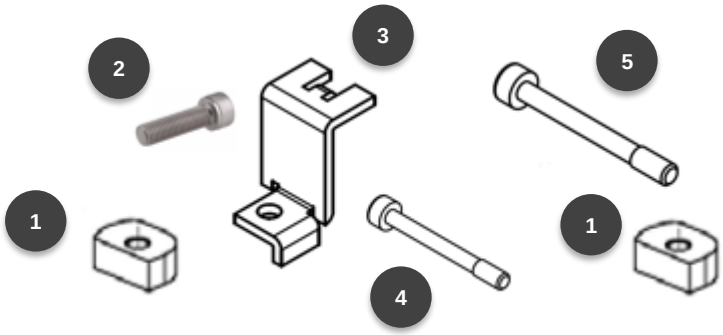
After the hardware change is completed, an automatic reinitialization is performed upon repowering of the station (VB voltage) again.

Any change of the valve island size requires a reconfiguration of the PLC / Hardware configuration for proper functioning and diagnosis.

2.5 Mounting kit 2-in-1

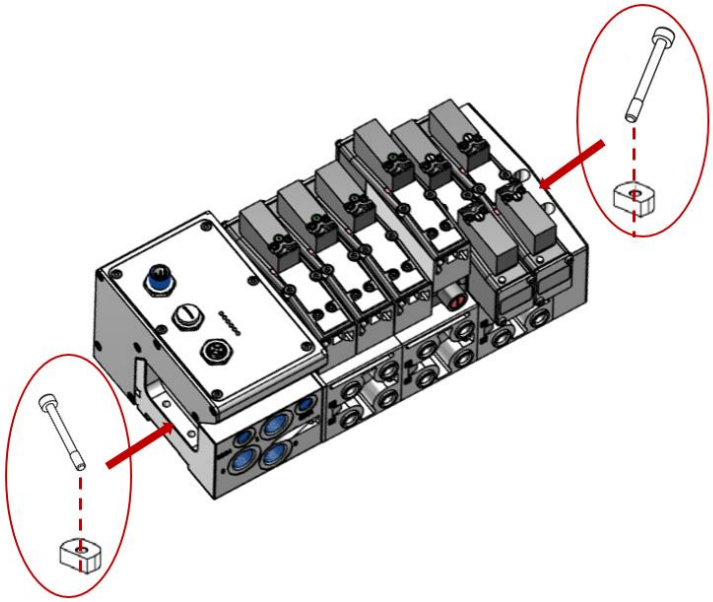
Every valve island delivery contains the mounting kit 2-in-1 (part number VS2672971-KG00) as shown in the below figure. This mounting kit can be used to mount the valve island either to the DIN rail or directly to the mounting panel.

1. Mounting nut DIN rail
2. Cylinder screw M4 x 8
3. Mounting bracket
4. Cylinder screw M4 x 25
5. Cylinder screw M4 x 36



2.5.1 DIN-rail assembly without mounting bracket

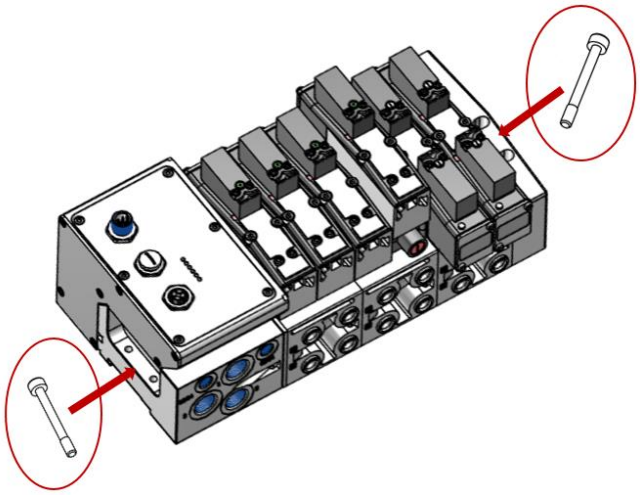
- Insert screw M4 x 25 (4) into the left end plate (bus node) and position below the mounting nut (1)
- Insert screw M4 x 36 (5) into the right end plate and position below the mounting nut (1)
- Place the valve island on the DIN-rail
- Orientate straight flange of the mounting nuts towards the DIN rail
- Push the valve island on the DIN-rail and tighten screws with the torque of 1.0 – 1.1 Nm
- Check the fit of the valve island



DIN-rail assembly without mounting bracket

2.5.2 Mounting panel assembly without mounting bracket

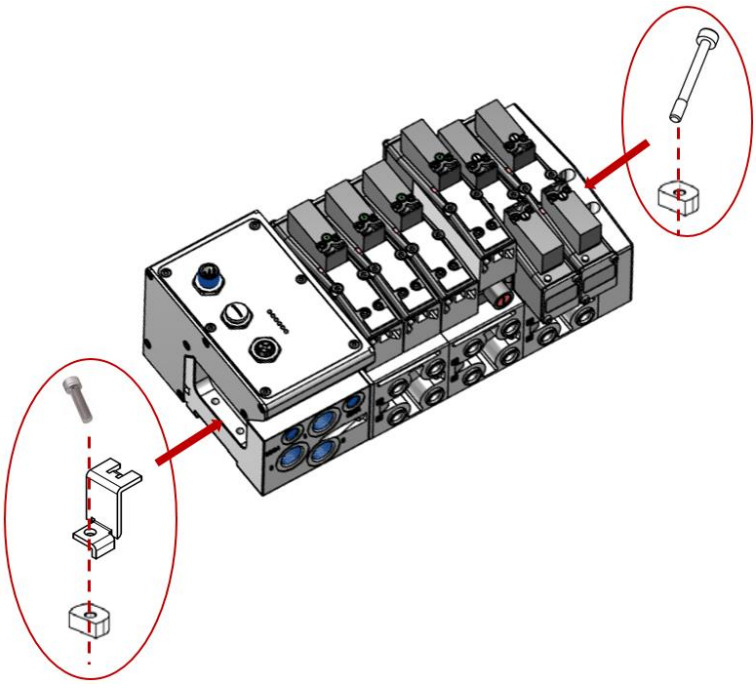
- Insert screw M4 x 25 (4) into the left end plate (bus node)
- Insert screw M4 x 36 (5) into the right end plate
- Place the valve island on the panel/ wall
- Tighten screws with the torque of 1.0 – 1.1 Nm
- Check the fit of the valve island



Mounting panel assembly without mounting bracket

2.5.3 DIN-rail assembly using the mounting bracket

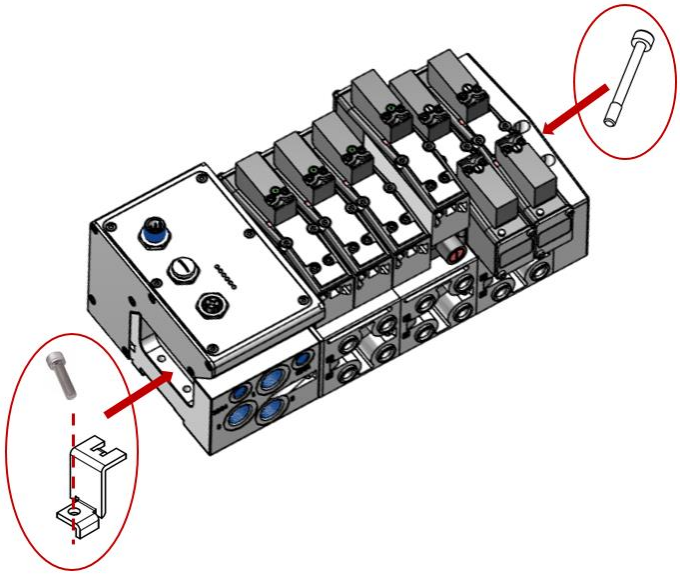
- Hook the mounting bracket (3) into the left end plate (bus node)
- Insert screw M4 x 8 (2) into the mounting bracket (3) and position below the mounting nut (1)
- Insert screw M4 x 36 (5) on the right end plate and position below the mounting nut (1)
- Place the valve island on the DIN-rail
- Orientate straight flange of the mounting nuts (1) towards the DIN rail
- Push the valve island on the DIN-rail and tighten screws with the torque of 1.0 – 1.1 Nm
- Check the fit of the valve island



DIN-rail assembly using the mounting bracket

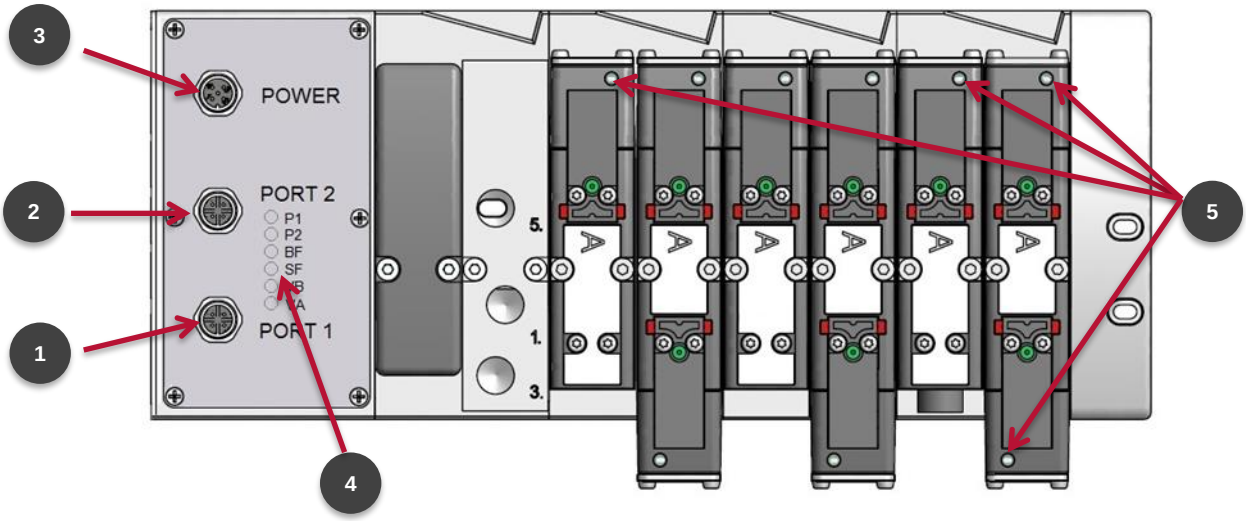
2.5.4 Mounting panel assembly using the mounting bracket

- Hook the mounting bracket (3) into the left end plate (bus node)
- Insert screw M4 x 8 (2) into the mounting bracket (3)
- Insert screw M4 x 36 (5) on the right end plate
- Place the valve island on the mounting panel/ wall
- Tighten screws with the torque of 1.0 – 1.1 Nm
- Check the fit of the valve island



Mounting panel assembly using the mounting bracket

3 Electrical connections of the VS18/VS26 valve island



Top view VS18 with 8 stations

1. Port 1 bus connector for PROFINET

   (4 pins M12 D-coded female connector)

2. Port 2 bus connector for PROFINET

   (4 pins M12 D-coded female connector)

3. Power supply connector

   (5-pins M12 A-coded male connector)

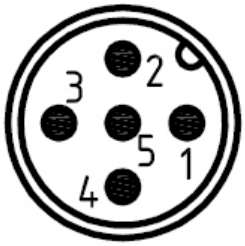
4. Status LEDs

5. Valve status LEDs

3.1 PROFINET Bus connectors Port 1 & Port 2

M12 / 4 pins / female / D-coded	
Pin no.	**Function**
1	Transmission Data + (TD+)
2	Receive Data + (RD+)
3	Transmission Data - (TD -)
4	Receive Data - (RD -)
Housing	FE (functional earth)

3.2 POWER supply connector



M12 / 5 pins / male / A-coded	
Pin no.	**Function**
1	L1 (VB+) 24V electronics power supply
2	N2 (VA-) 0V valves power supply
3	N1 (VB-) 0V electronics power supply
4	L2 (VA+) 24V valves power supply
5	FE (functional earth)

4 Commissioning

The method of PROFINET module installation strongly depends on the configuration software. Please refer to the configuration software manual.

All the examples in this document are made with Siemens TIA Portal V13.

4.1 GSDML file installation

A device description file (GSD-file) is needed for configuration of the valve island. The GSD-file is in XML Format (GSDML) and could be used for both variants VS18 and VS26:

➲ *GSDML-V2.32-IMI_Norgren-Vx_IMI-JJJJMMDD.XML*

Note: ”JJJJMMDD”(JJJJ- year, MM-month, DD-day) is date of release

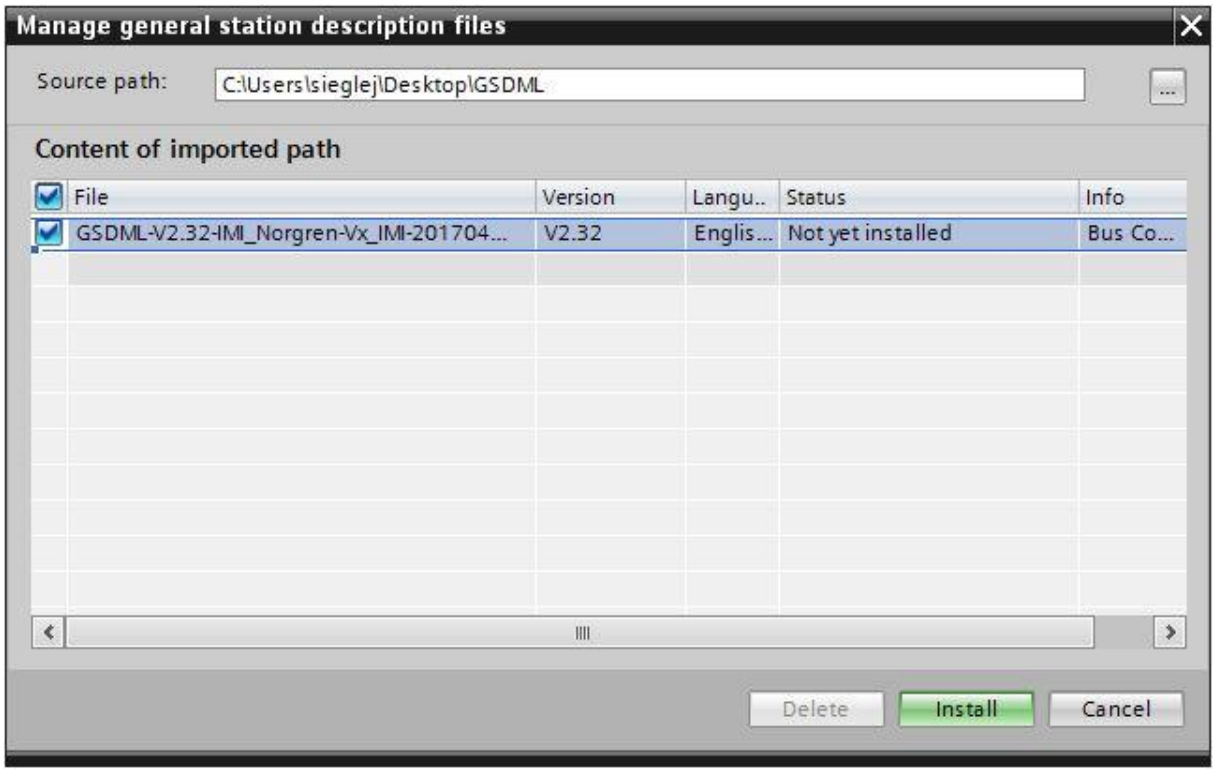
The GSDML file has to be installed inside the engineering tool of the PROFINET controller.

The symbol file is used to visualize the device in the engineering tool. XML files are provided by the device vendor and can be downloaded from:

➲ *https://www.imi-precision.com/uk/en/technical-support/software*

Open GSDML-file Import editor:

“Options” -> “Manage general station description files”

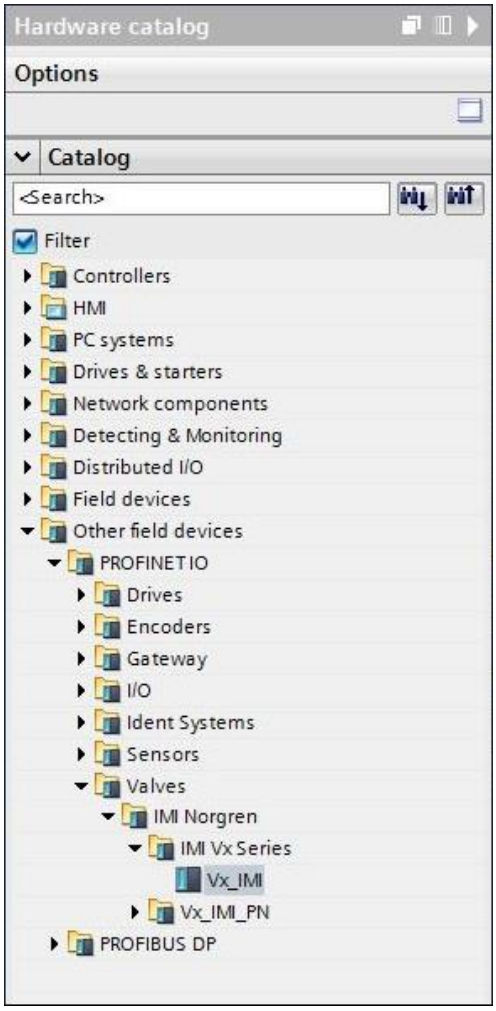


After the successful installation of the GSDML-file the VS18/26 is listed in the Hardware catalog.

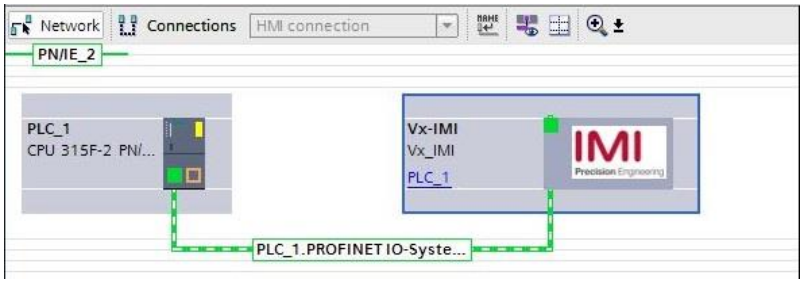
4.2 Hardware configuration: Select valve island

After successful GSDML installation the valve island appears in category „Other field devices >…> Vx_IMI“.

Drag the Vx_IMI valve island entry and drop it into the PROFINET-IO system.



Hardware catalogue after installation of the XML file



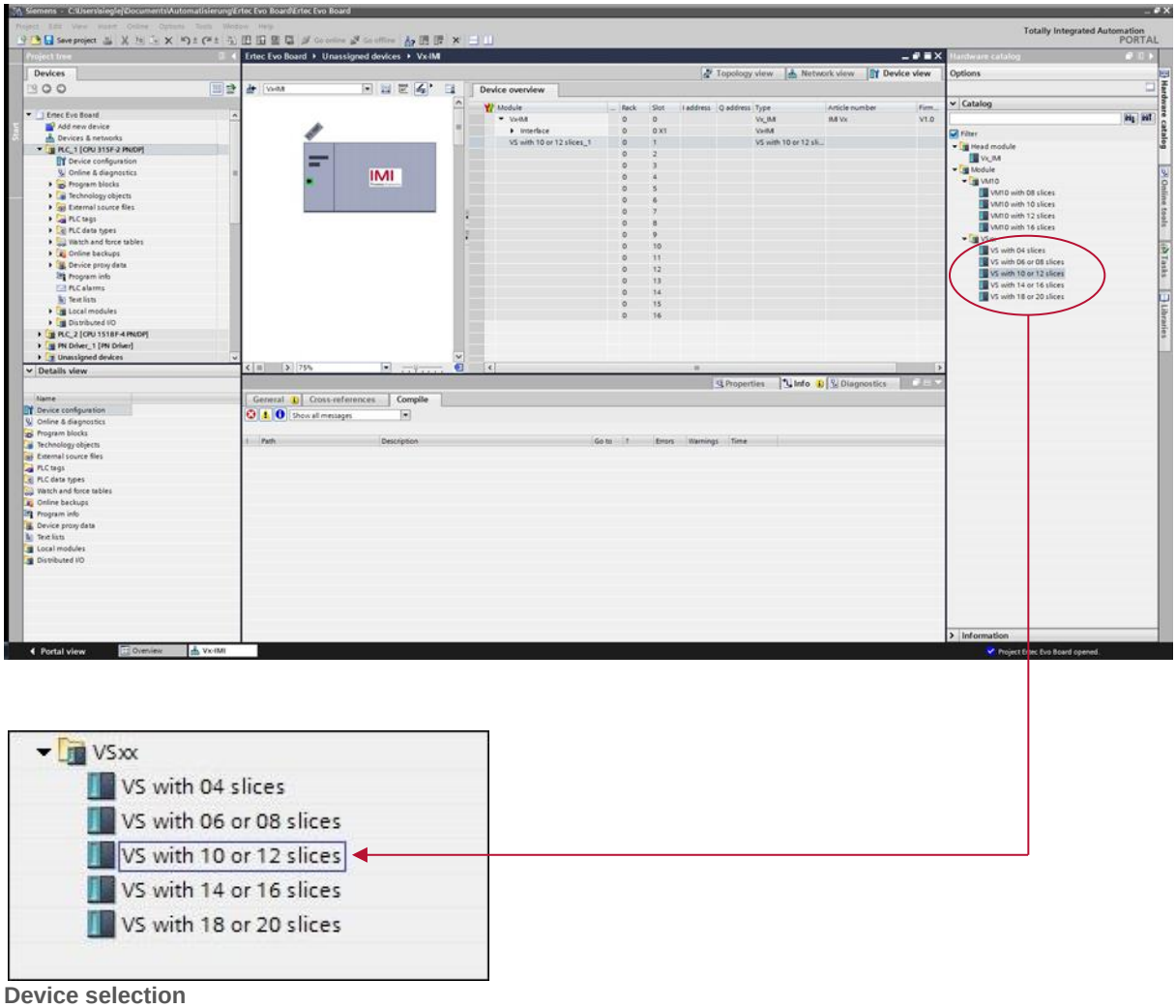
View after adding the valve island

As a next step the valve module has to be assigned to slot 1. The following table shows which valve module has to be chosen for which physical configuration.

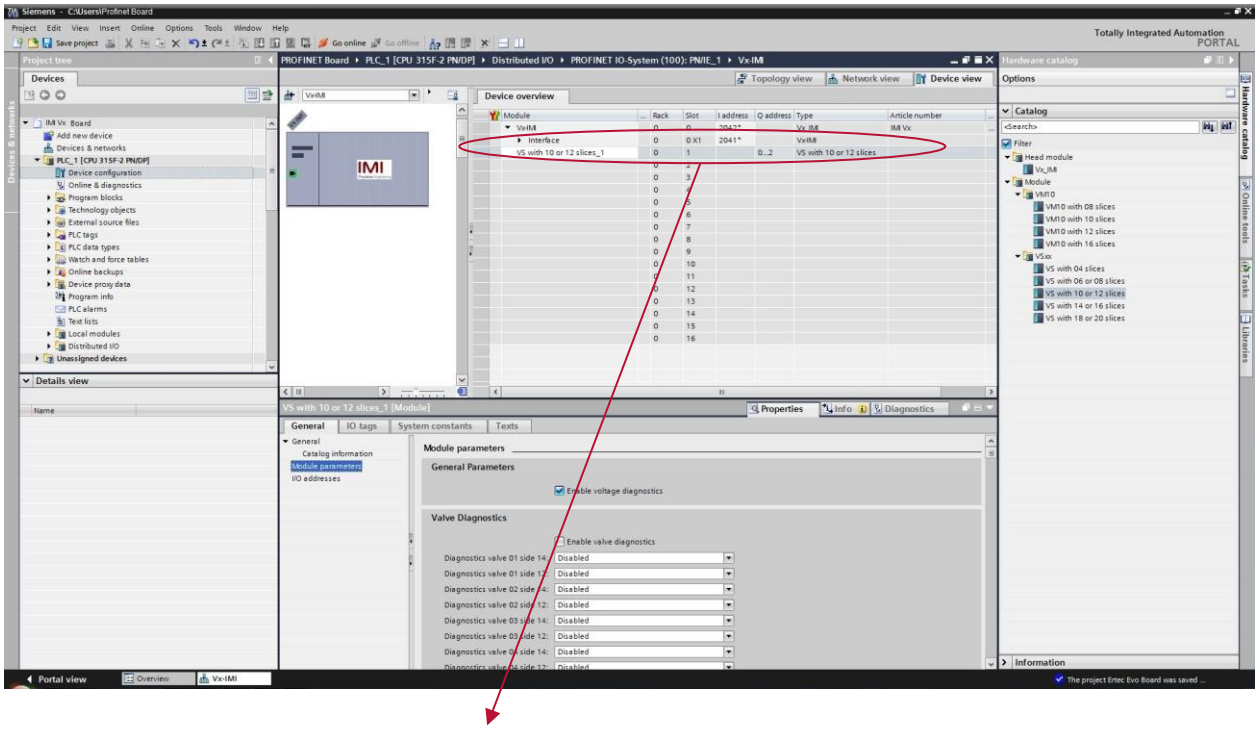
Please check the correct number of valve slices on the valve island. An empty slice is also counted as a valve slice.

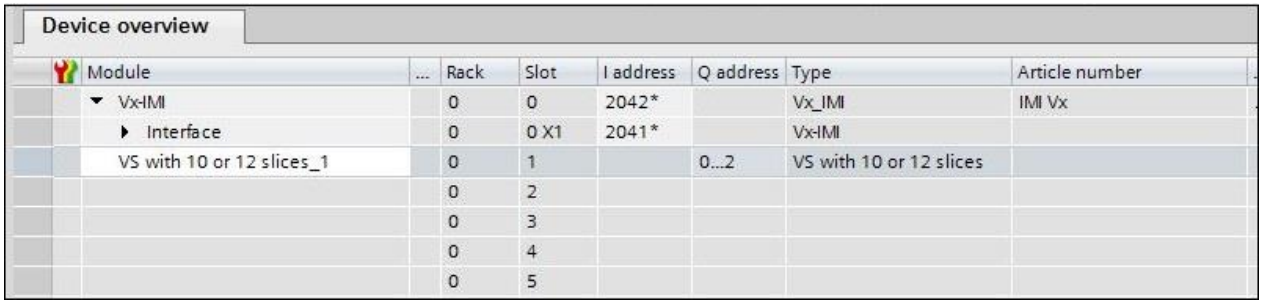
Number of valve slices	Module Name
4	„VS with 04 slices“
6	„VS with 06 or 08 slices “
8	„VS with 08 or 10 slices “
10	„VS with 10 or 12 slices “
12	„VS with 10 or 12 slices “
14	„VS with 14 or 16 slices “
16	„VS with 14 or 16 slices “
18	„VS with 18 or 20 slices “
20	„VS with 18 or 20 slices “

Table: Device name assignment



Device selection





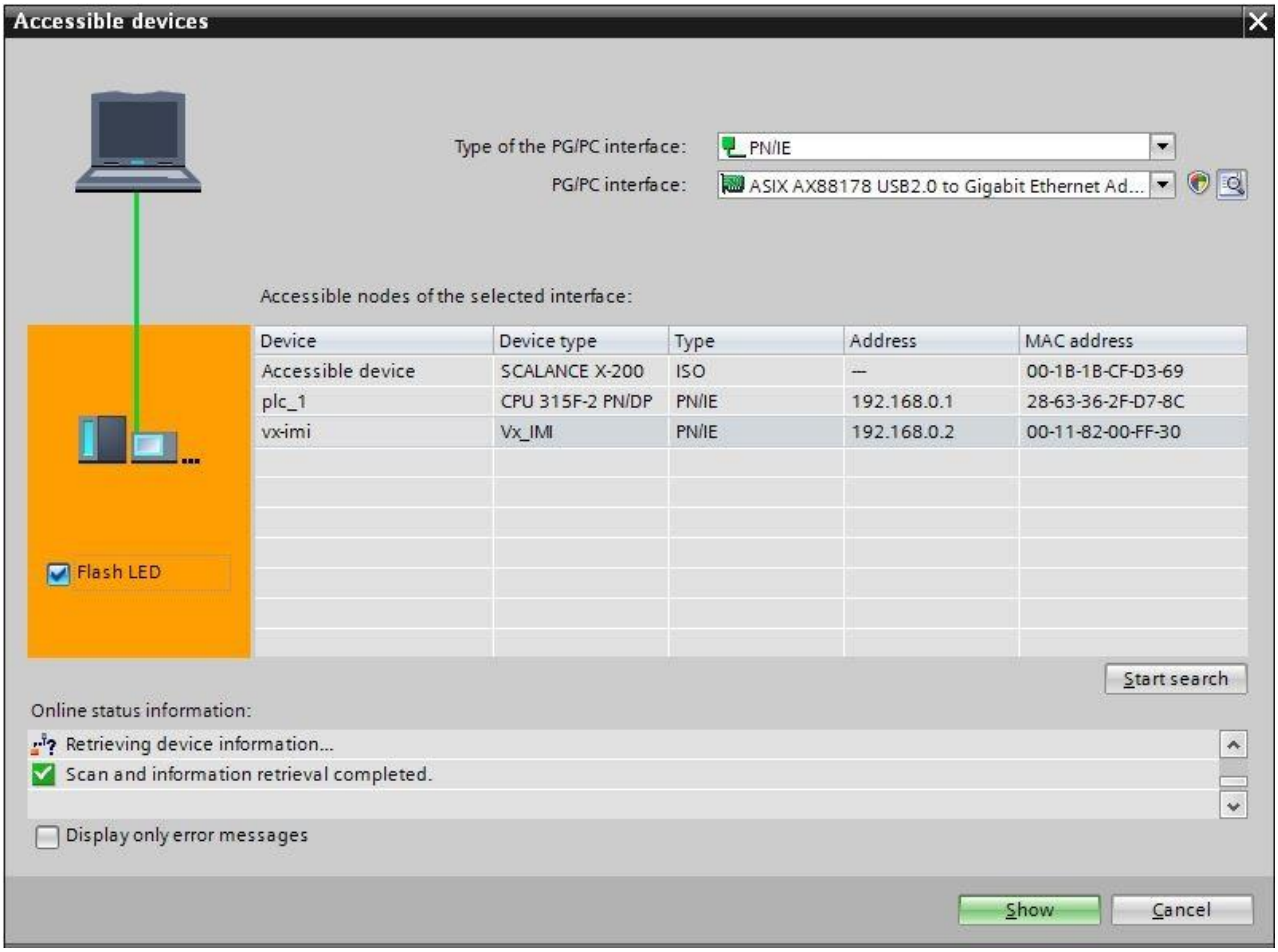
Device overview							
Module	...	Rack	Slot	I address	Q address	Type	Article number
Vx-IMI		0	0	2042*		Vx_IMI	IMI Vx
Interface		0	0 X1	2041*		Vx-IMI	
VS with 10 or 12 slices_1		0	1		0...2	VS with 10 or 12 slices	
		0	2				
		0	3				
		0	4				
		0	5				

View after adding VS device with 10 or 12 valve stations

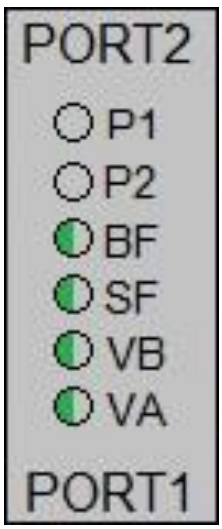
4.3 Identifying devices in the network „Blink Test“

PROFINET devices are identified by using their MAC address and device type. Use the configuration tool to identify all PROFINET modules in the network.

“Online” -> “Accessible devices”



Mark an available valve island and enable checkbox “Flash LED”. This activates the LEDs: BF, SF, VB and VA flashing in green color for 3 seconds.



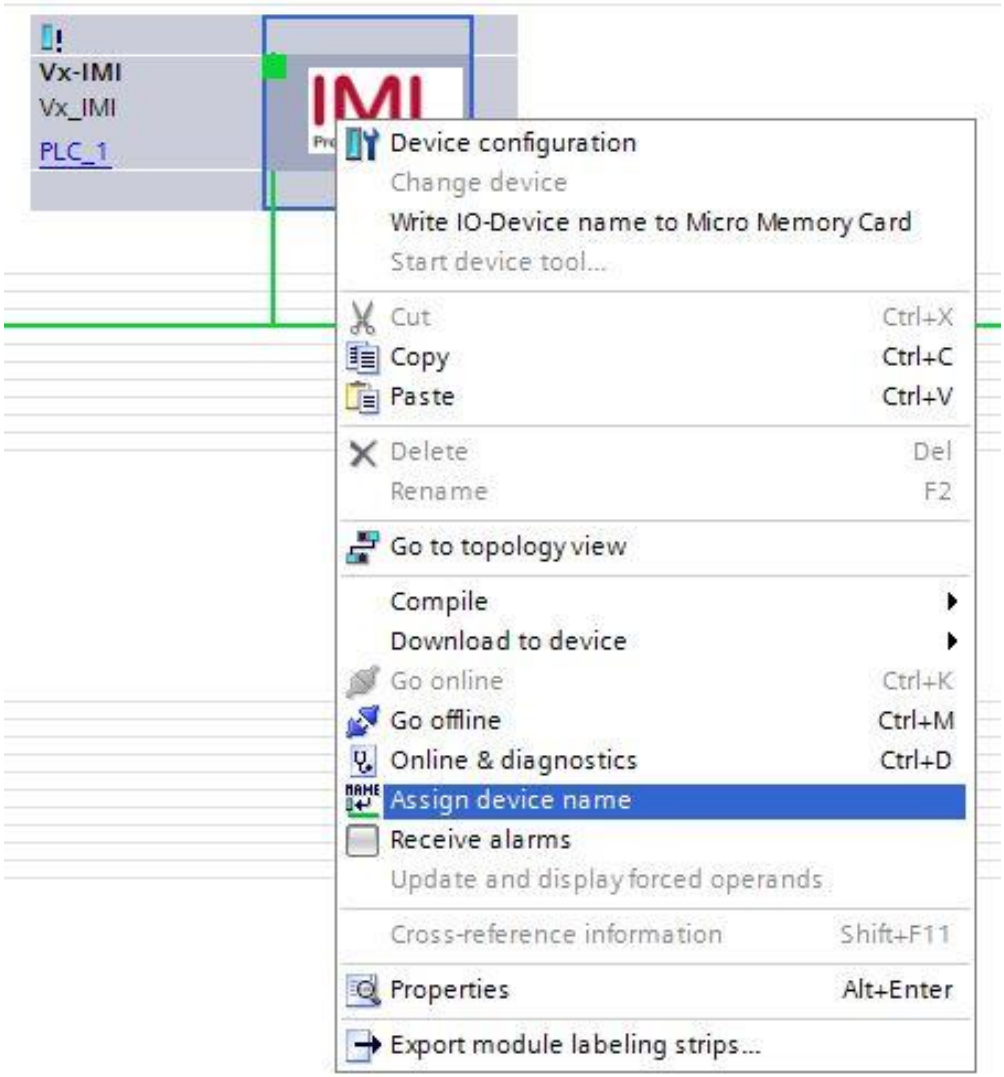
4.4 Assignment of device name

Before the PROFINET communication between PROFINET controller and valve island is able to start, a unique device name has to be assigned. The device name is stored on the valve island.

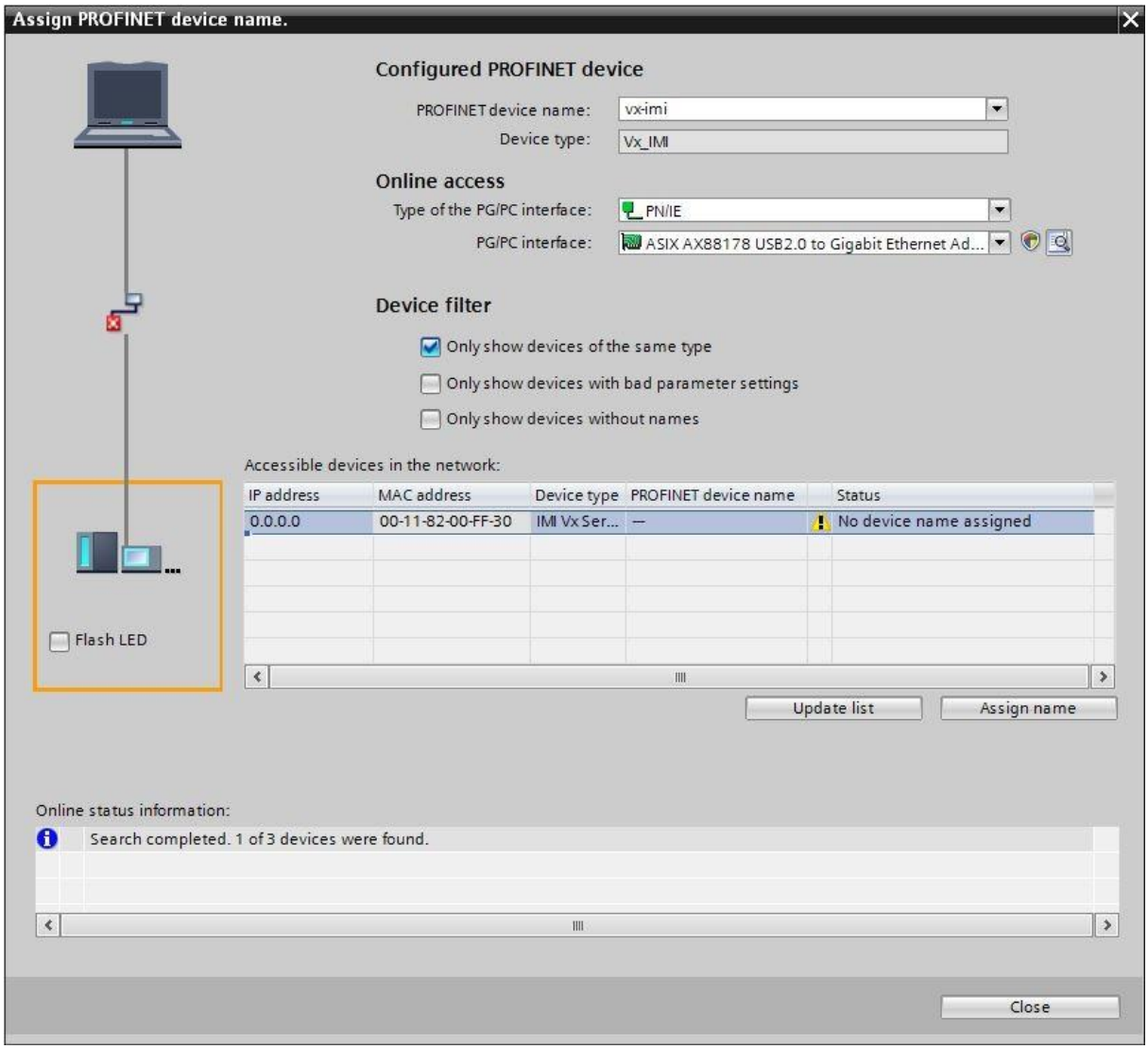
Note:

Several engineering- and service tools are able to assign PN device names (E.g. PROFINET Commander, PRONETA, TIA). There are also different ways to assign the device name in TIA Portal.

Right Click on the valve island in the “Network View“ of TIA opens its context menu in “Online-mode”. Press “Assign device name” item to open the „Assign PROFINET device name“ dialog.

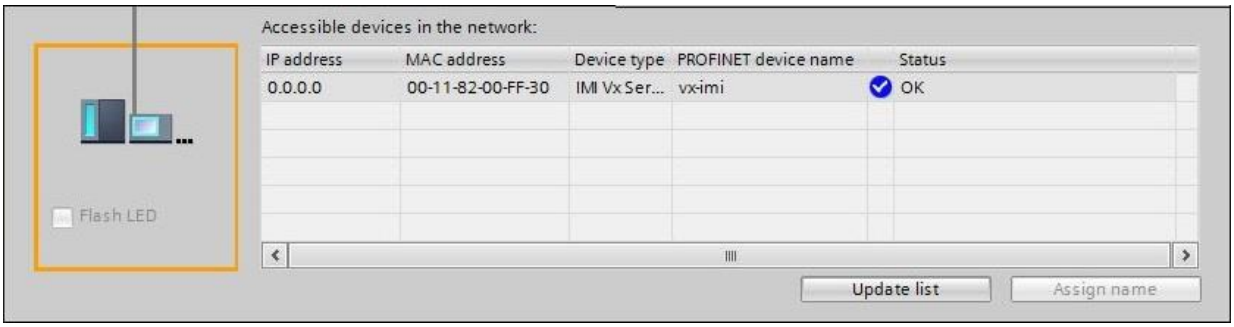


Enter a unique device name for the valve island in the “PROFINET device name” field. Push the “Assign name” button to assign the entered device name.



Assign PROFINET device name dialog

After successful name assignment the status of the valve island in the device list will change to OK.

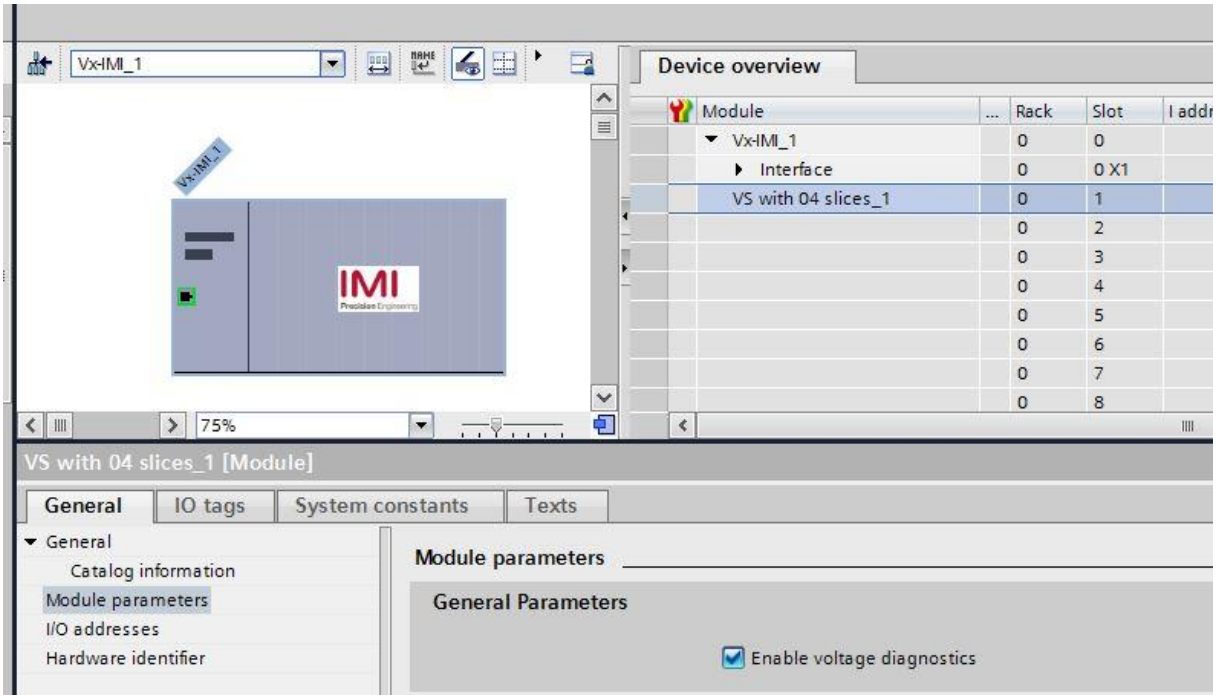


List with accessible devices in the network

4.5 Parameterization

During system startup a parameter set is loaded to the valve island by the PROFINET controller. The parameter set of the valve module is divided into the sections “General Parameters”, “Valve Diagnostics” and “Substitute behavior”.

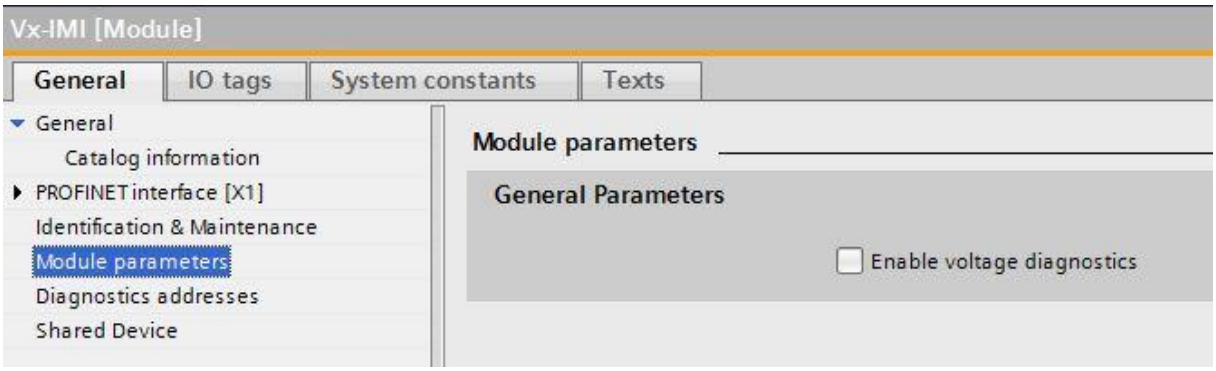
Those parameters are accessible on the “Properties” page of the valve module using the “Device view” of TIA.



4.5.1 General Parameters

It is possible to enable/disable the voltage monitor of the valve module.

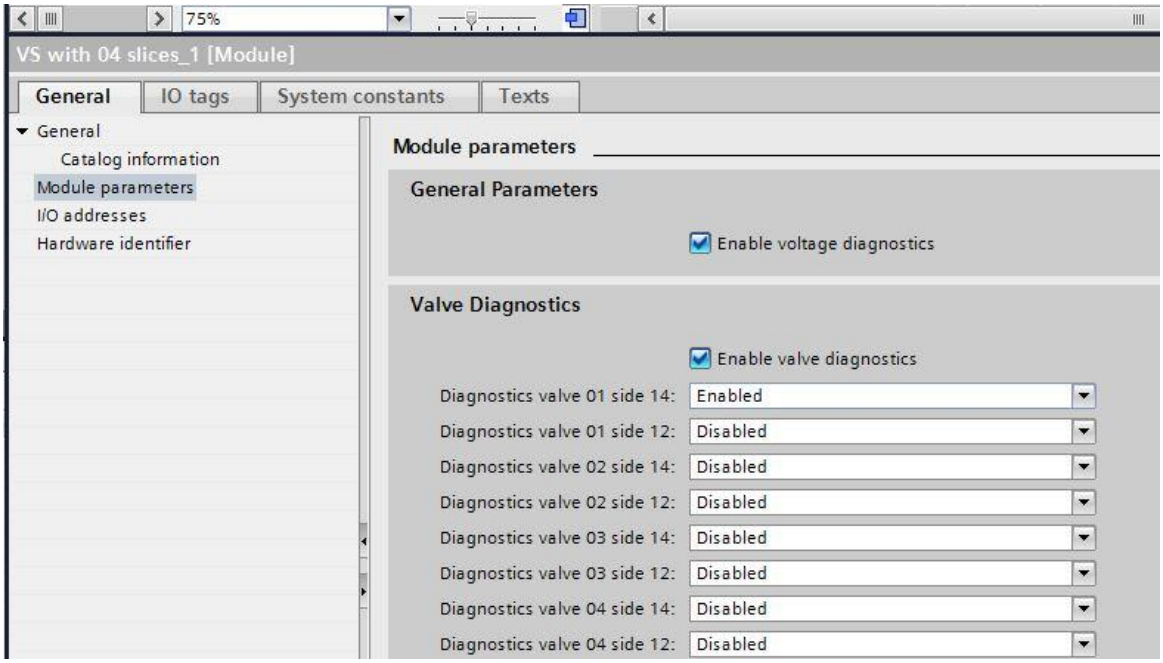
If disabled, in case of over/under voltage no PROFINET diagnostic alarm appears and the relating LEDs on the valve island don’t change from green to red color as well. Otherwise, a PROFINET module diagnostic alarm appears (error code see chapter 7) and the relating LEDs on the valve island change to red (see also chapter 6.1).



Default configuration: Voltage diagnostic is enabled

4.5.2 Valve Diagnostics

It is possible to enable/disable the valve diagnostics (channel diagnostic) in general or for each single solenoid. If disabled, in case of a wire break or a short circuit of a solenoid no PROFINET diagnostic alarm appears and the SF LED remains green as well. Otherwise a PROFINET channel diagnostic alarm appears (with error code and channel number) and the SF LED changes state (see also chapter 6.1).

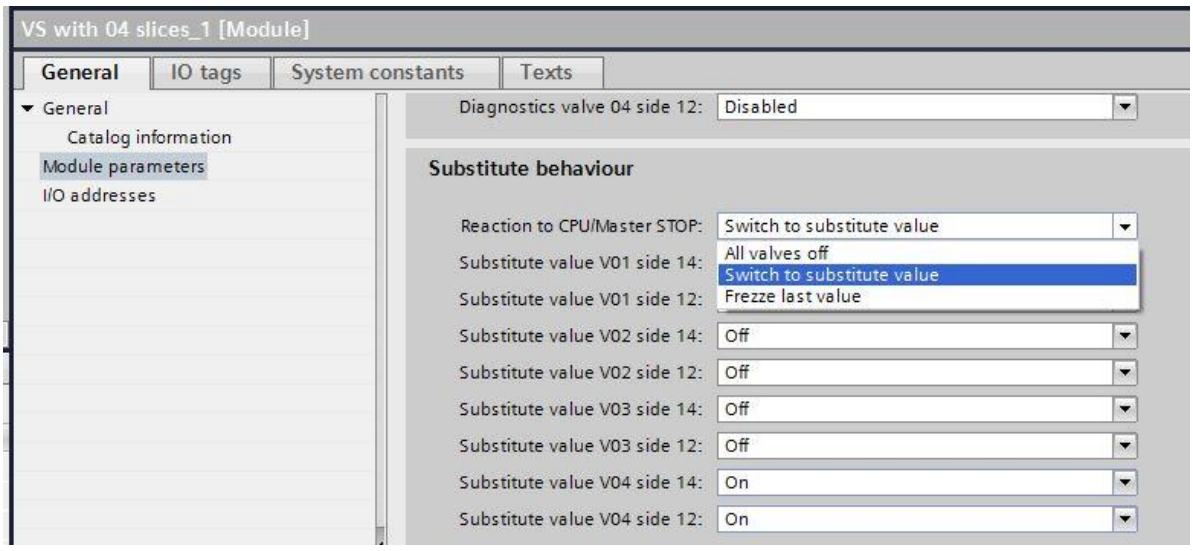


Default configuration: Valve diagnostic is disabled

4.5.3 Substitute behavior

It is possible to define the behavior of the outputs in case of “IOPS = Bad” (PLC stopped) or broken PROFINET communication. The following states could be defined by the outputs:

- *Clear output*
- *Set output*
- *Freeze output*



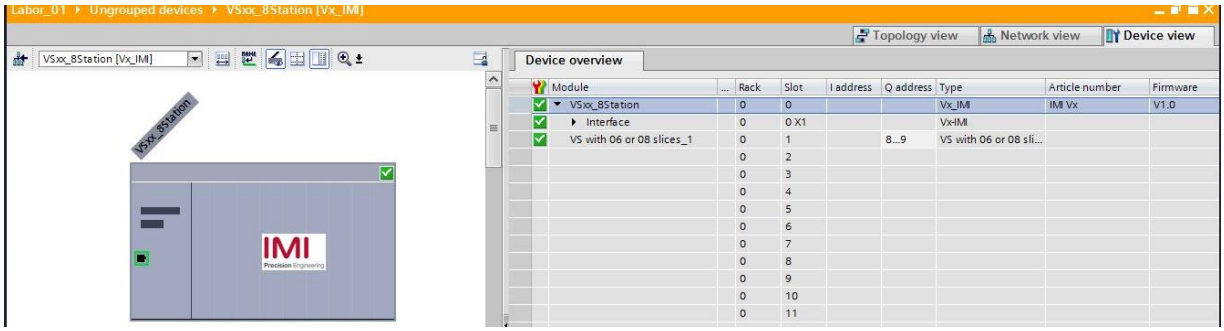
Default configuration: All valves off

4.6 Firmware version and serial number

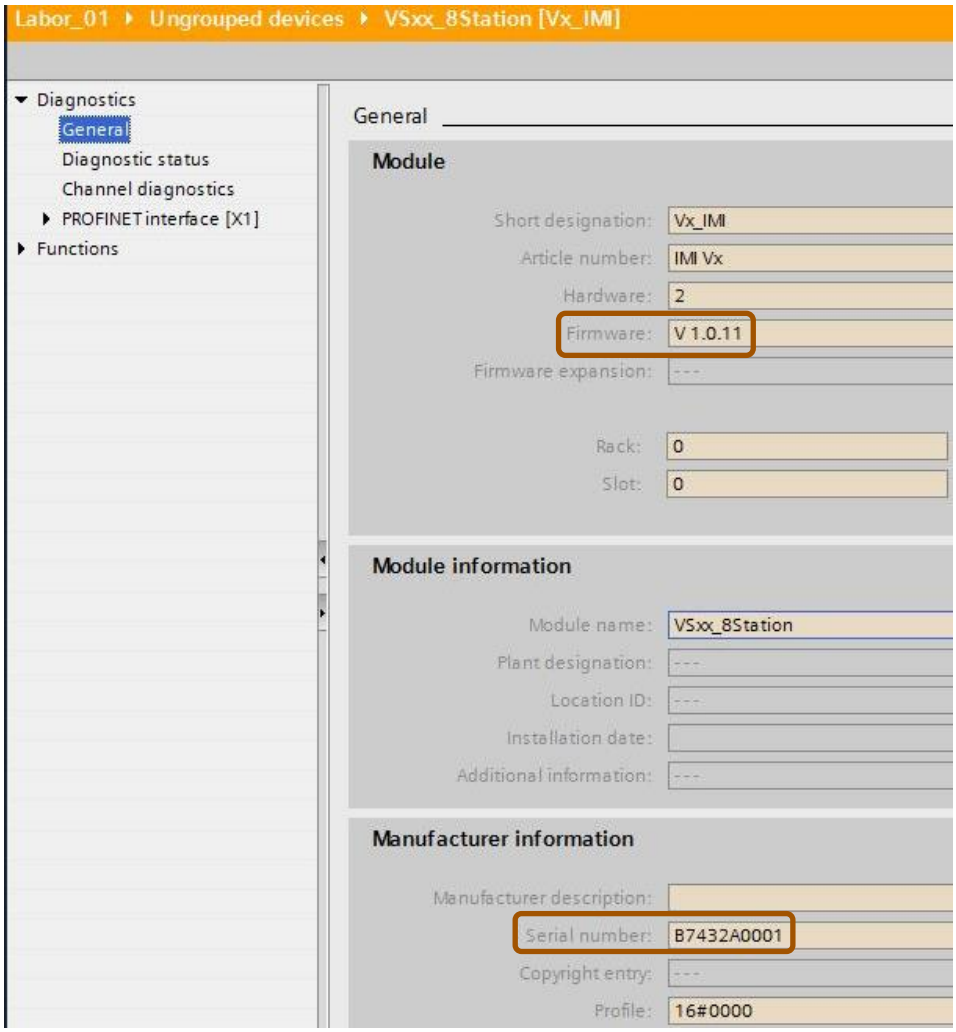
It is possible to read the actual installed firmware version and serial number of the device using the TIA portal.

Connect to the PLC by clicking the “Go Online” button.

Double click the Vx Module on Slot 0 in the “Device View”



Tab “General” shows the Module and Manufacturer information such as the Firmware version or Serial number.



4.7 Compilation and download

After finished configuration please compile the project and download it to the PROFINET controller (PLC).

5 Output data

5.1 Address assignment

To calculate the length of the used output data (in bytes) for the VS18/VS26 valve configuration please use the following formula:

$$B(Bytes) = \frac{V * 2 + \big((V * 2) MOD 8\big)}{8}$$

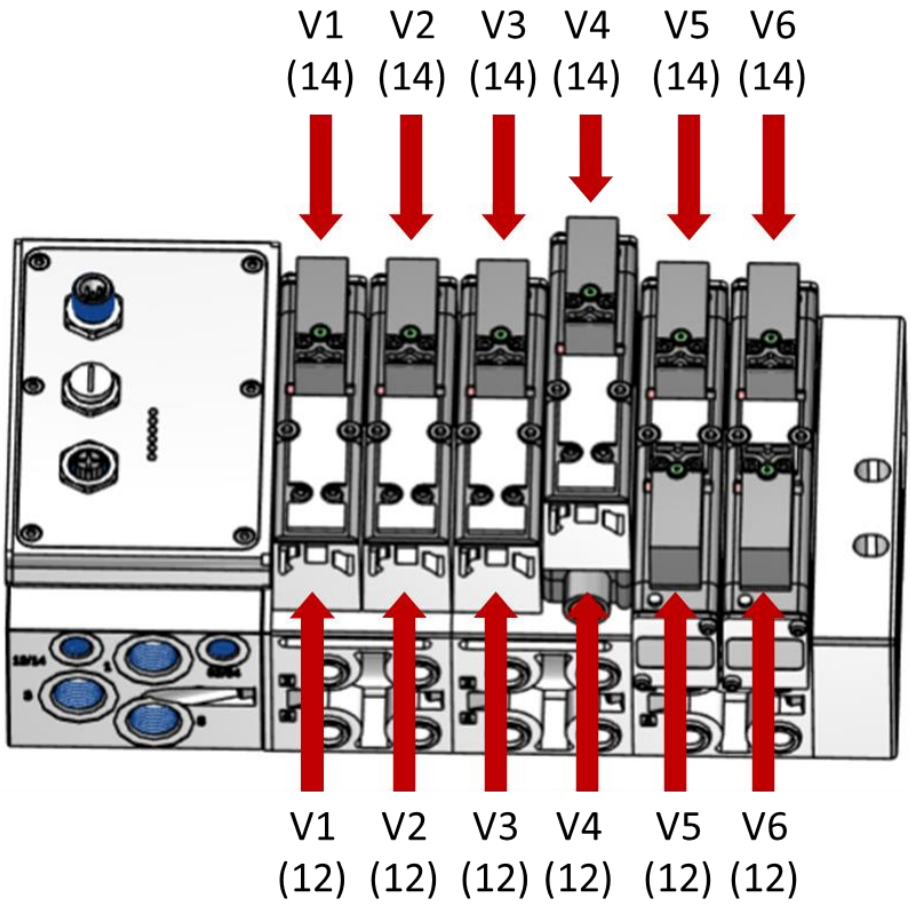
$$V \in \{4,6,8,10,12,14,16,18,20\}.$$

Whereby ´V´= number of valve slices and 'MOD' = Modulo-Operator

E.g. for a valve island with 6 valve slices

$$B = \frac{6 * 2 + (6 * 2) MOD 8}{8} = \frac{12 + 12 MOD 8}{8} = \frac{16}{8} = 2$$

i.e. there are 2 bytes reserved for 6 valve slices



The picture shows VS valve island with 6 valve slices

The table below shows the assignment for maximum configuration of 20 valve slices. For every valve two bits will be reserved – one bit for solenoid 14 and one bit for solenoid 12.

byte	Bit								total valve number								
	7	6	5	4	3	2	1	0	4	6	8	10	12	14	16	18	20
0	V 04		V 03		V 02		V 01		X	X	X	X	X	X	X	X	X
	S 12	S 14	S 12	S 14	S 12	S 14	S 12	S 14									
1	V 08		V 07		V 06		V 05			X	X	X	X	X	X	X	X
	S 12	S 14	S 12	S 14	S 12	S 14	S 12	S 14									
2	V 12		V 11		V 10		V 09					X	X	X	X	X	X
	S 12	S 14	S 12	S 14	S 12	S 14	S 12	S 14									
3	V 16		V 15		V 14		V 13							X	X	X	X
	S 12	S 14	S 12	S 14	S 12	S 14	S 12	S 14									
4	V 20		V 19		V 18		V 17									X	X
	S 12	S 14	S 12	S 14	S 12	S 14	S 12	S 14									

(V = Valve no., S = Solenoid side, X = Bytes reserved)

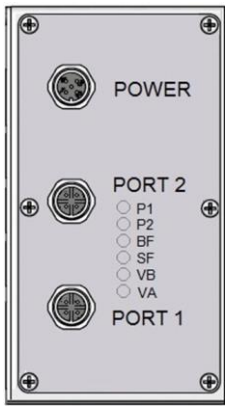
5.2 Output behavior at power up and in fault condition

At power up all outputs are cleared. The initialization phase of the valve island is indicated by a one by one activation of the status LEDs BF, SF, VA, VB and the status LEDs of the valve stations.

In case of fault condition (broken communication, “IOPS = bad”) the outputs switch to those values which are configured in the “substitute behavior” parameter set (see also chapter 4.5.3).

6 Diagnostics and LEDs

6.1 Status LEDs



6.1.1 Status LEDs description

LED Name	Description
P1	Link Port 1 (TX/RX & Link)
P2	Link Port 2 (TX/RX & Link)
BF	Bus Error
SF	System Error
VB	Electronic Power Supply Status
VA	Valve Power Supply Status

6.1.2 Link states for Port P1 and Port P2

Link Status	LED State
Link connection established	yellow
Link communication active	flashing yellow / green
Link connection not established	off

6.1.3 Bus Error Status LED (BF)

Bus Status	LED State
No error	green
Device is offline	red
Hardware configuration and parameterization is not plausible	flashing, red
IOPS = BAD	tripple flashing, red
PROFINET Software is not initialized	off

6.1.4 Error Status LED (SF)

System-Status	LED State
No error	green
Solenoid, short circuit or open circuit	flashing, red
Error, internal communication	double flashing, red
Fatal error	tripple flashing, red
Hardware configuration is not plausible	red
Device is not initialized	off

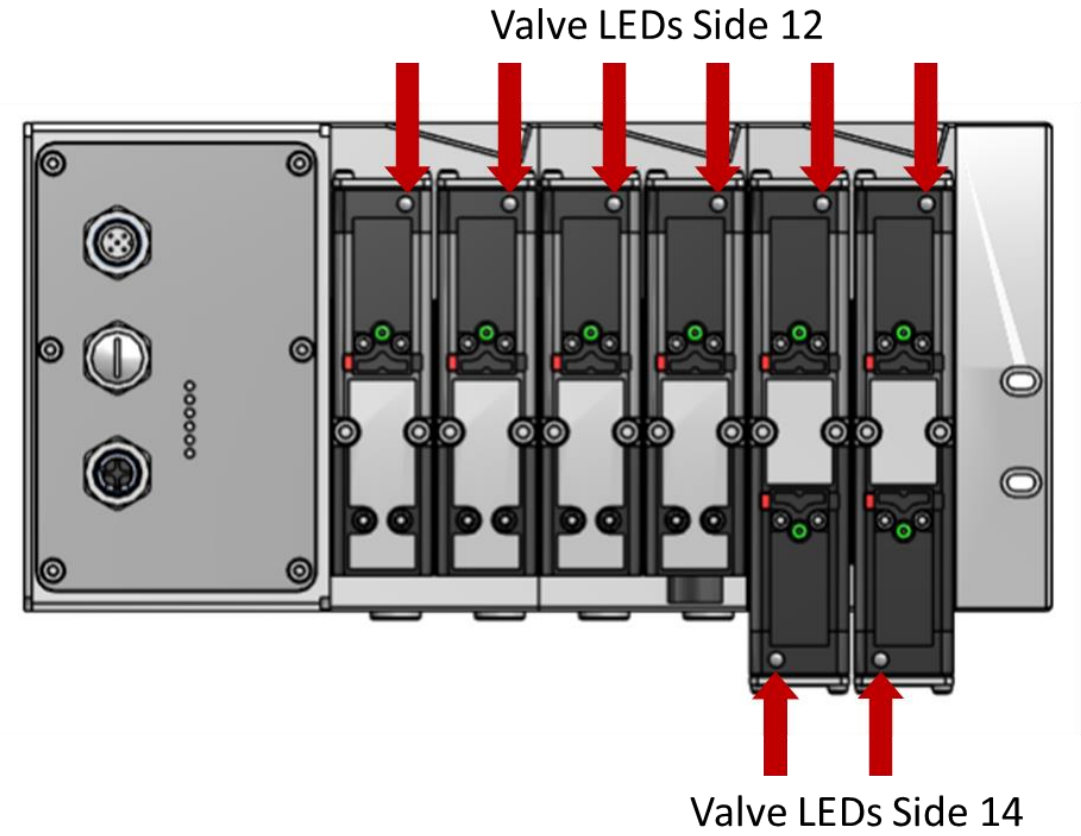
6.1.5 Electronics Power Supply Status, LED (VB)

Status	LED State
Voltage OK	green
Undervoltage	flashing red
Overvoltage	permanent red

6.1.6 Valve Power Supply Status, LED (VA)

Status	LED State
Voltage OK	green
Undervoltage	flashing red
Overvoltage	red

6.2 Valve slice Status LEDs



Each valve slice has one or two separate status LEDs depending on its configuration, which indicate the control states “14“ and “12” for the corresponding pilot valve solenoids.

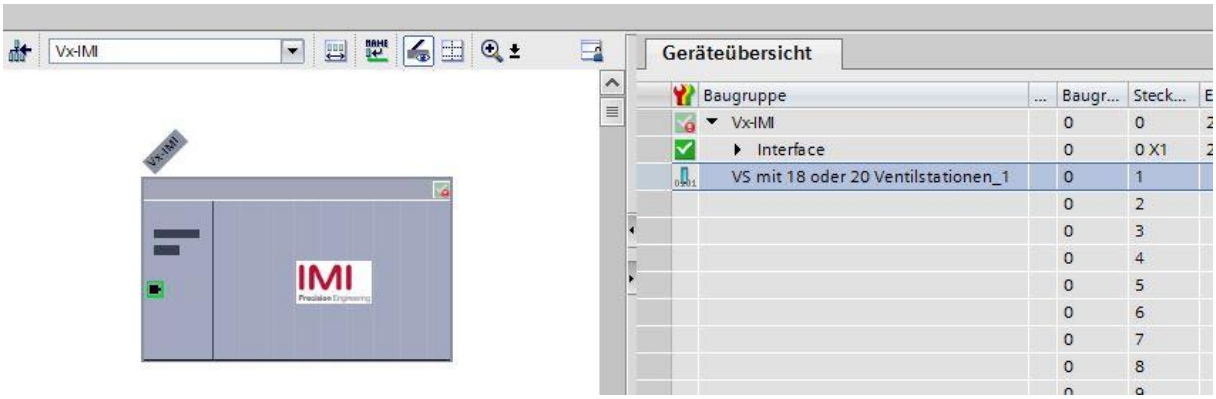
Status	LED State
Valve not powered	off
Valve powered	on

6.3 Online diagnostics with Siemens TIA Portal

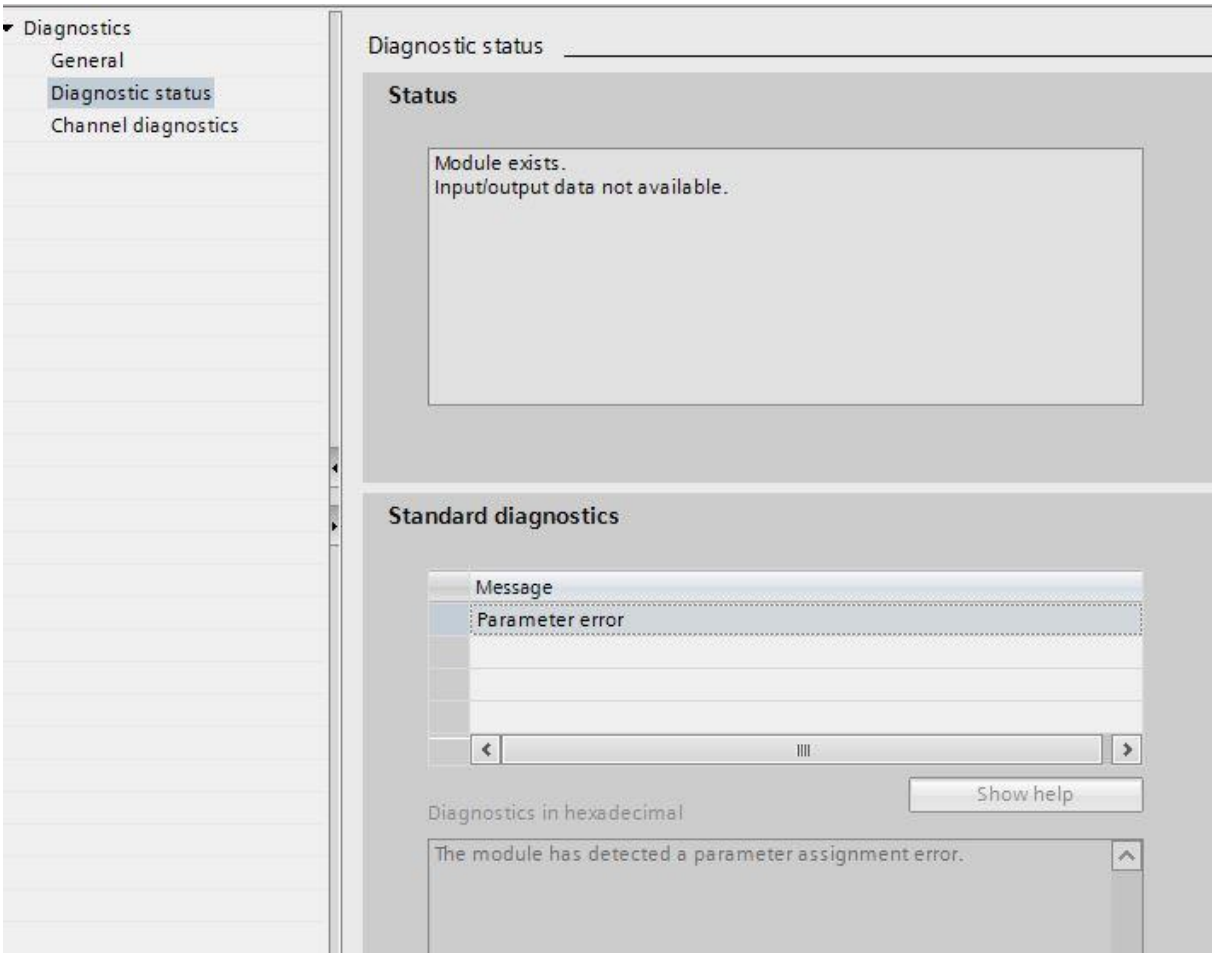
Use the “Network View“ or “Device View” and “Go online” for PROFINET diagnostics of the network or device.

6.3.1 Wrong module

In case of a mismatch between configured module and physically module on slot 1 the module is marked with a parameter error symbol in the “Device overview” of the “Device view”.

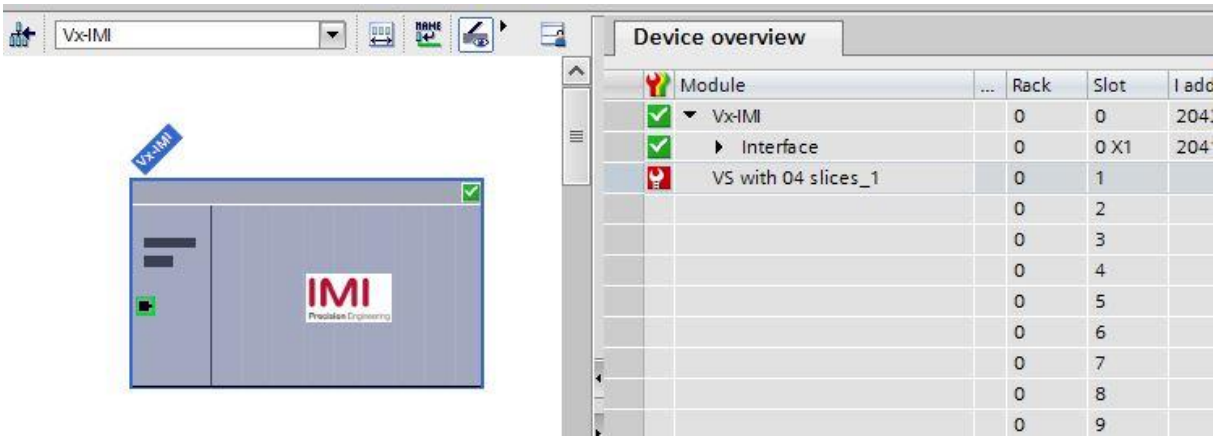


Double click the symbol to change into diagnostics view of the module. Highlight the “Diagnostic status” line to get detailed information about the pending module diagnostics.

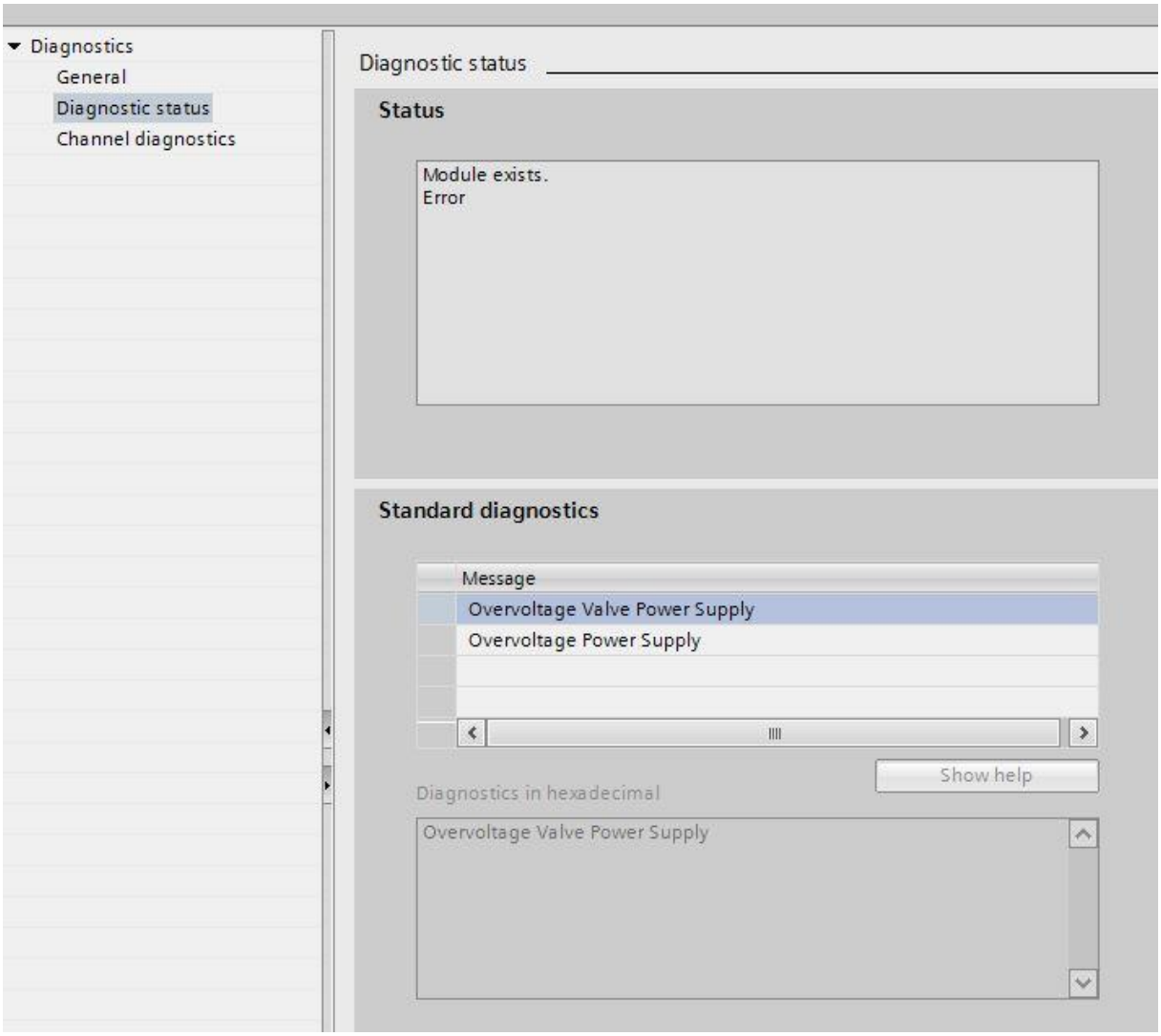


6.3.2 Module diagnostics (e.g. under/overvoltage)

In case of pending module diagnostics of the valve island (e.g. under/overvoltage) the module is marked with a red symbol in the “Device overview” of the “Device view”.

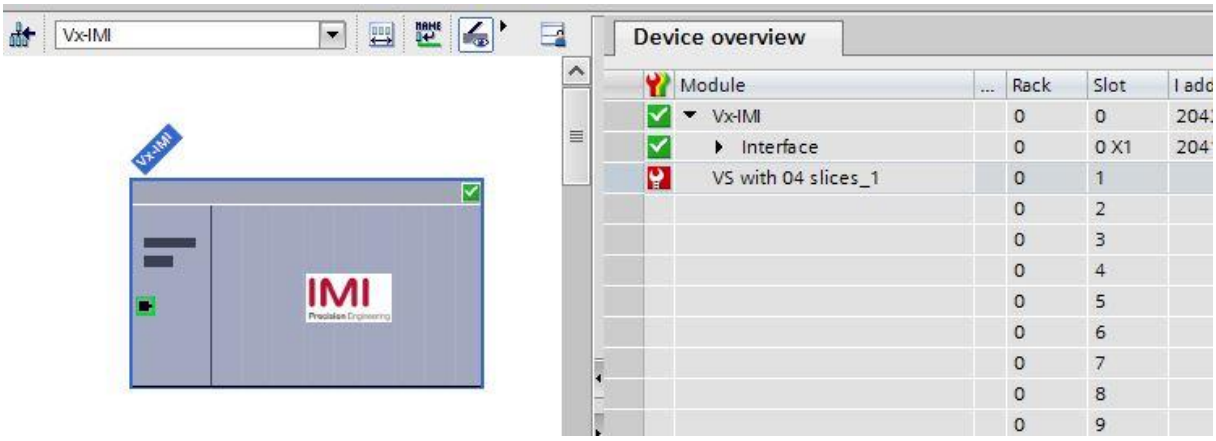


Double click the red symbol to change into diagnostics view of the module. Highlight the “Diagnostic status” line to get detailed information about the pending module diagnostics.

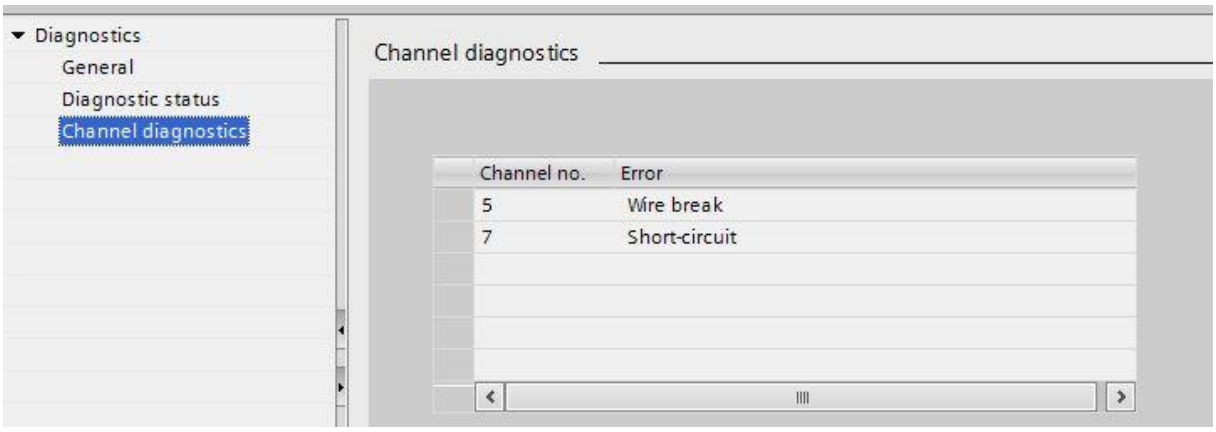


6.3.3 Channel diagnostics (e.g. wire break of solenoid)

In case of pending channel diagnostics of the valve island (e.g. wire break or short circuit of a solenoid) the module is marked with a red symbol in the “Device overview” of the “Device view”.



Double click the red symbol to change into diagnostics view of the module. The channel number and the error reason are shown in the “Channel diagnostics” table.



The allocation between channel number and solenoid is shown in the following table:

Valve 1…4	V04-12	V04-14	V03-12	V03-14	V02-12	V02-14	V01-12	V01-14
Channel number	8	7	6	5	4	3	2	1
Valve 5…8	V08-12	V08-14	V07-12	V07-14	V06-12	V06-14	V05-12	V05-14
Channel number	16	15	14	13	12	11	10	9
Valve 9…12	V12-12	V12-14	V11-12	V11-14	V10-12	V10-14	V09-12	V09-14
Channel number	24	23	22	21	20	19	18	17
Valve 13…16	V16-12	V16-14	V15-12	V15-14	V14-12	V14-14	V13-12	V13-14
Channel number	32	31	30	29	28	27	26	25
Valve 17…20	V20-12	V20-14	V19-12	V19-14	V18-12	V18-14	V17-12	V17-14
Channel number	40	39	38	37	36	35	34	33

7 PROFINET error codes

Error code (hexadecimal)	Error description	Associated LED
0x00	OK, no errors	*„SF“ LED, green*
0x01	Solenoid, short circuit	*„SF“ LED, flashing red*
0x06	Solenoid, open circuit	*„SF“ LED, flashing red*
0x100	Undervoltage VB electronic supply	*„VB“ LED, flashing red*
0x101	Overvoltage VB electronic supply	*„VB“ LED, red*
0x102	Undervoltage VA valve supply	*„VA“ LED, flashing red*
0x103	Overvoltage VA valve supply	*„VA“ LED, red*

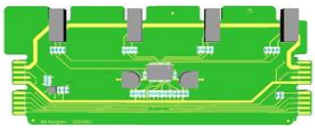
8 Properties PROFINET interface

Requirements		Comments
Number of ports	2	---
Transfer speed	100Mbit/s	---
Duplex mode	Full Duplex	---
RT mode	supported	Real Time Protocol
IRT mode	supported	Isochronous Real Time Protocol
MRP mode	supported	Media Redundancy Protocol (possible to switch between redundant transmission paths)
PROFINET (certification by PNO)	Compliant to IEC61158, Conformance Class C according to IEC61784	---
Adressing mode	DCP, LLDP + SNMP (Device exchange by the same topology)	---
GSD Language	EN + DE	---

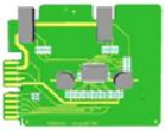
9 Valve island extension

Valve islands can be extended using the 2- and 4-station PCBs as described in this chapter.

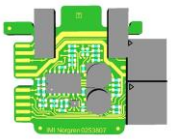
The following PCBs are available for the extension:



VS2672762-KG00
4 station PCB



VS2672761-KG00
2 station PCB

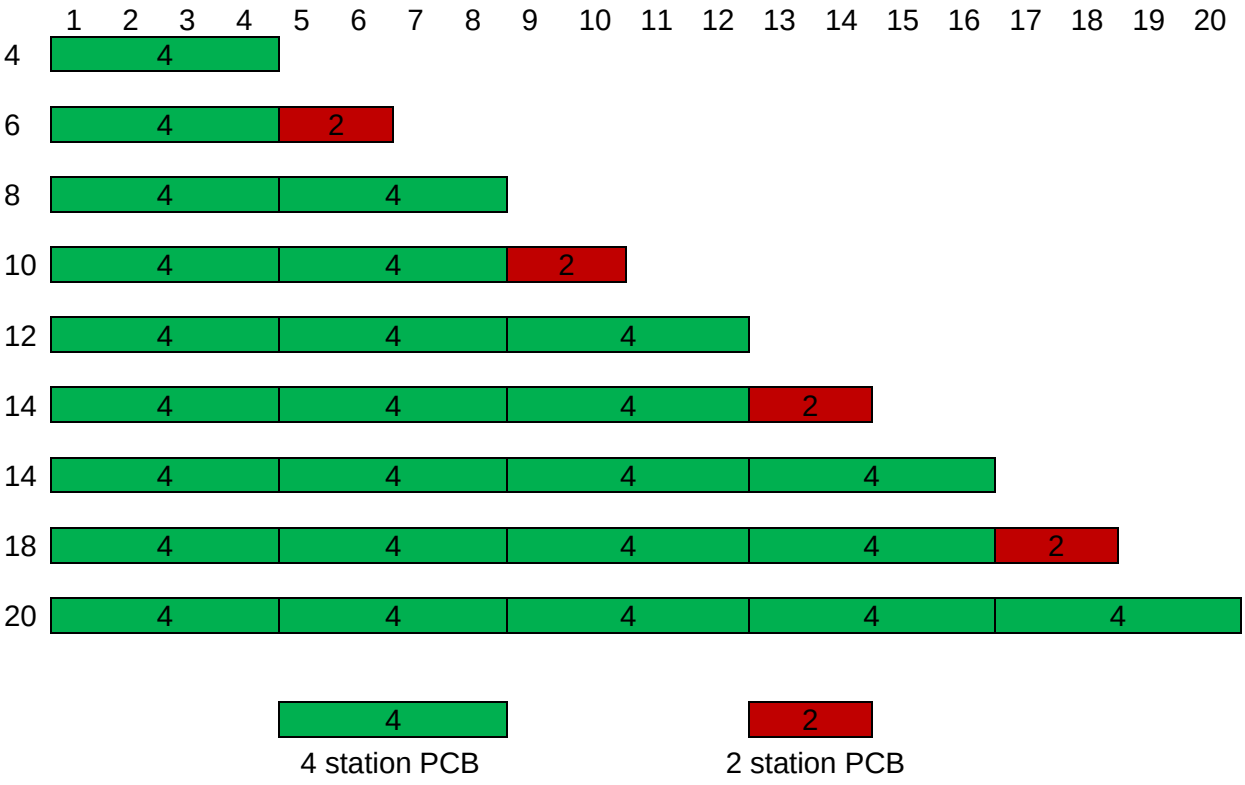


VS2672764-KG00
(new) 2 station PCB

shall only be mounted at the end in below configurations

9.1 Overview – preferred combinations SPI boards

Below illustration shows an overview of the preferred combinations of existing PCBs in order to build the required number of valve stations.



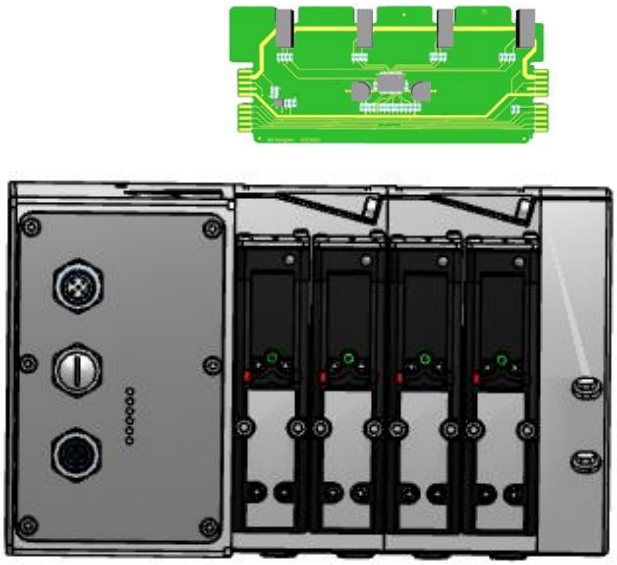
Note:

It is generally possible to use the new 2 station PCBs (VS2672764-KG00) on all positions but it is recommended to use the above combinations.

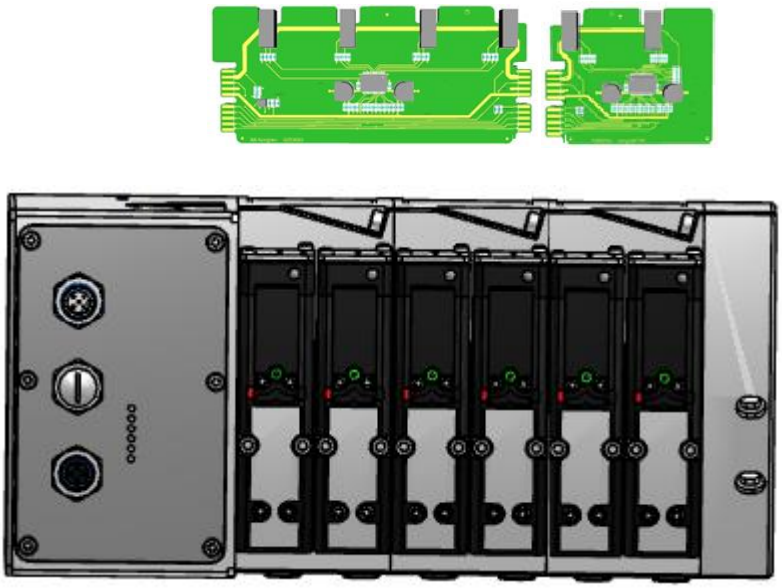
In special cases with increased modularity requirements, the product support should be contacted.

The below sections show the preferred combinations of the existing SPI boards for various valve island configurations.

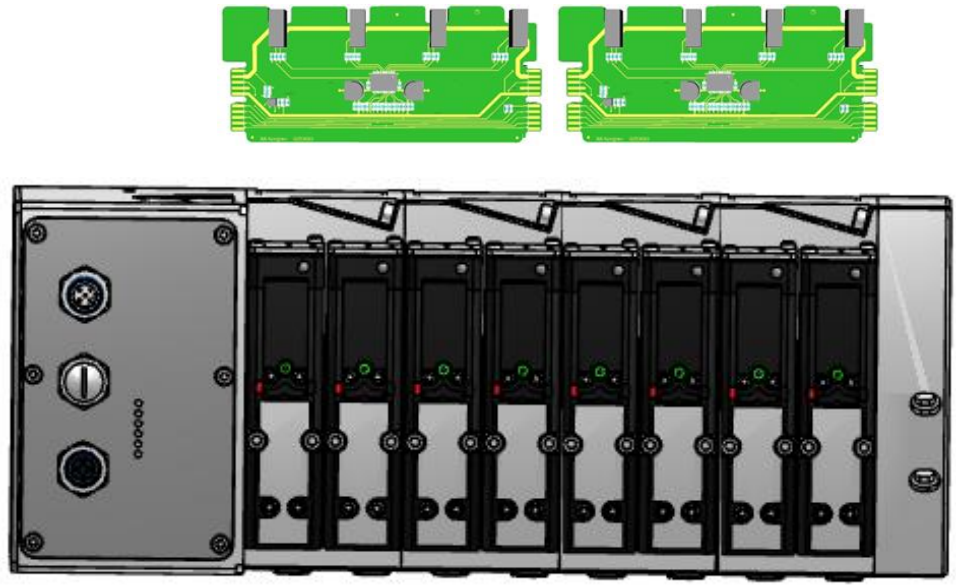
9.2 Valve island with 4 stations



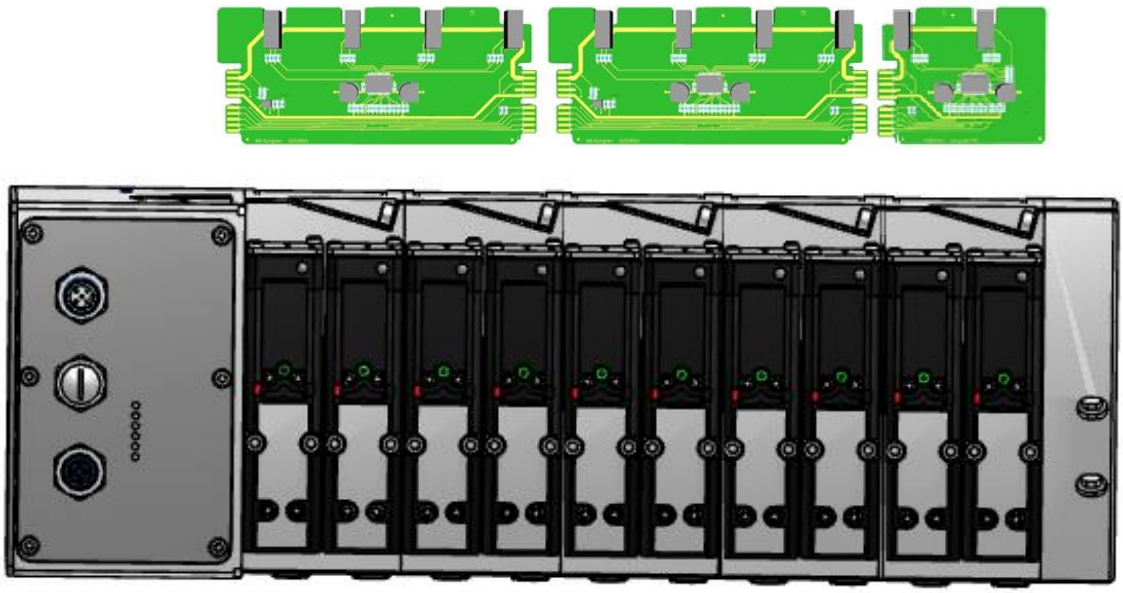
9.3 Valve island with 6 stations



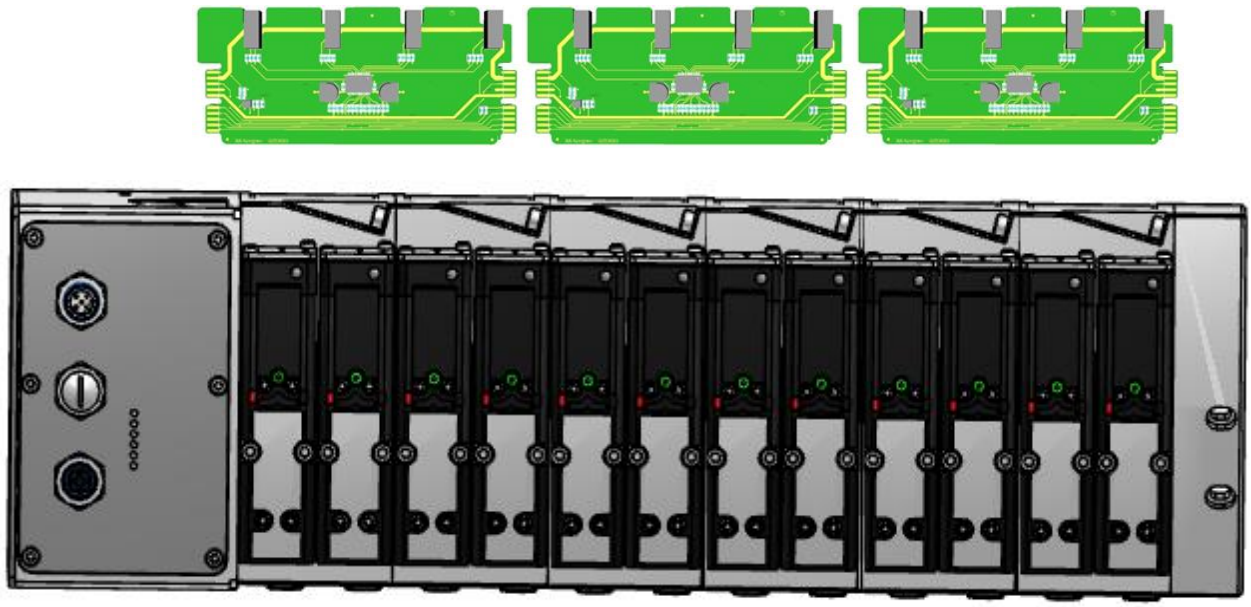
9.4 Valve island with 8 stations



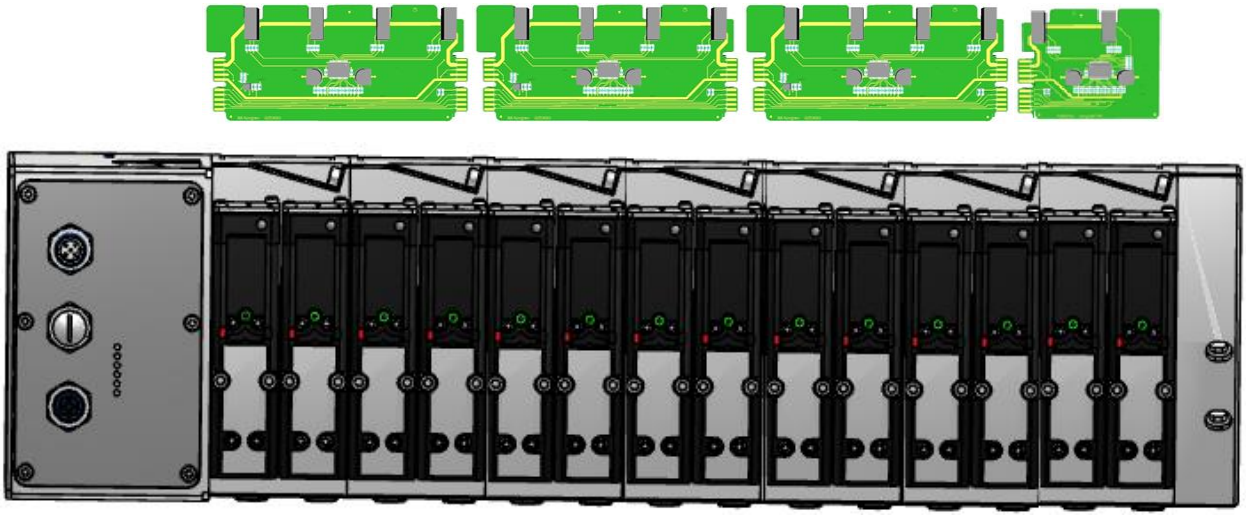
9.5 Valve island with 10 stations



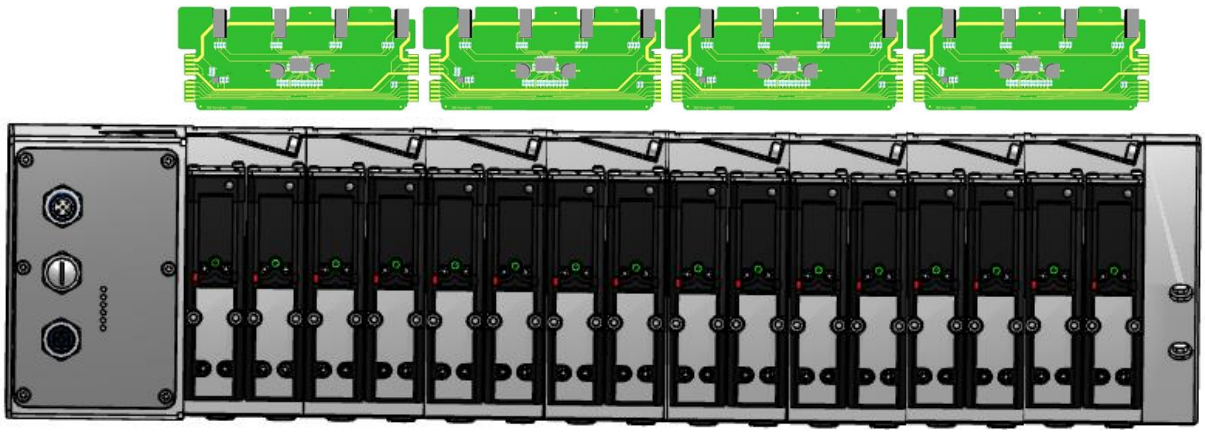
9.6 Valve island with 12 stations



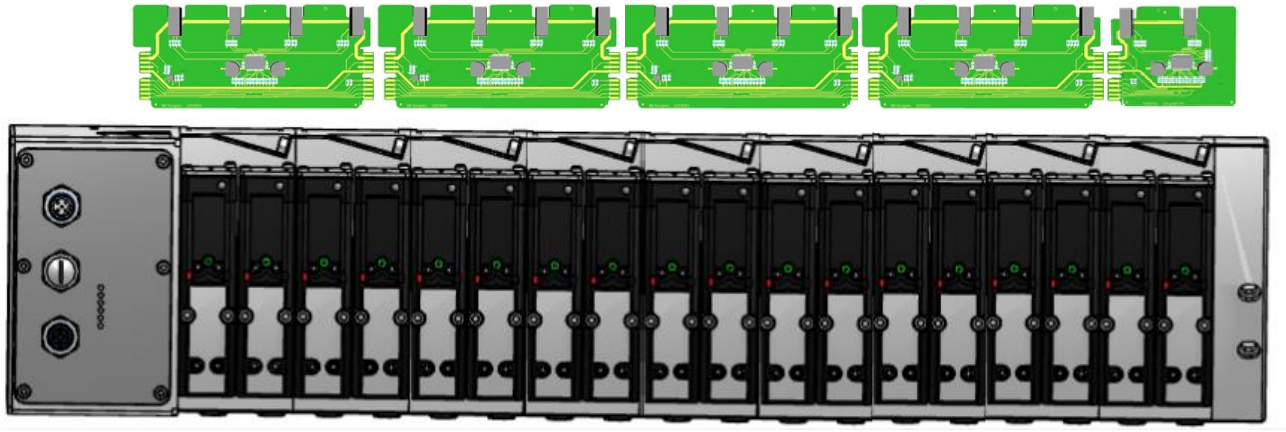
9.7 Valve island with 14 stations



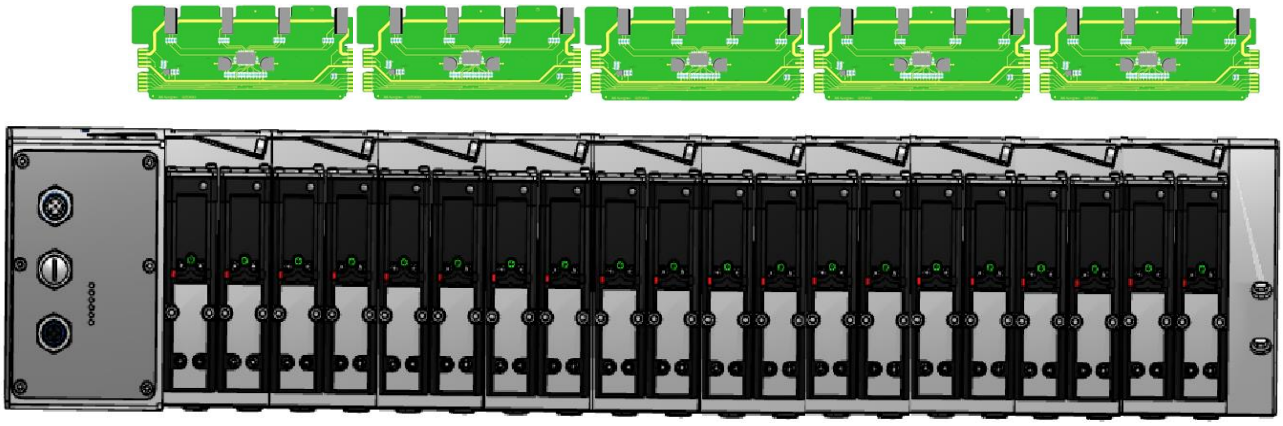
9.8 Valve island with 16 stations



9.9 Valve island with 18 stations



9.10 Valve island with 20 stations



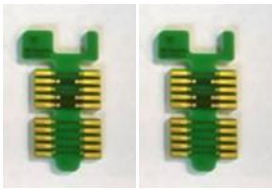
9.11 Usage of Soft-start valves

Soft-start valves are only available for VS26.

Maximum number of soft-start valves in one valve island is 4.

Use always 2 single blank PCBs (VS2672763-KG00) with 1 soft-start valve (VS2672530-KG00).

VS2672530-KG00

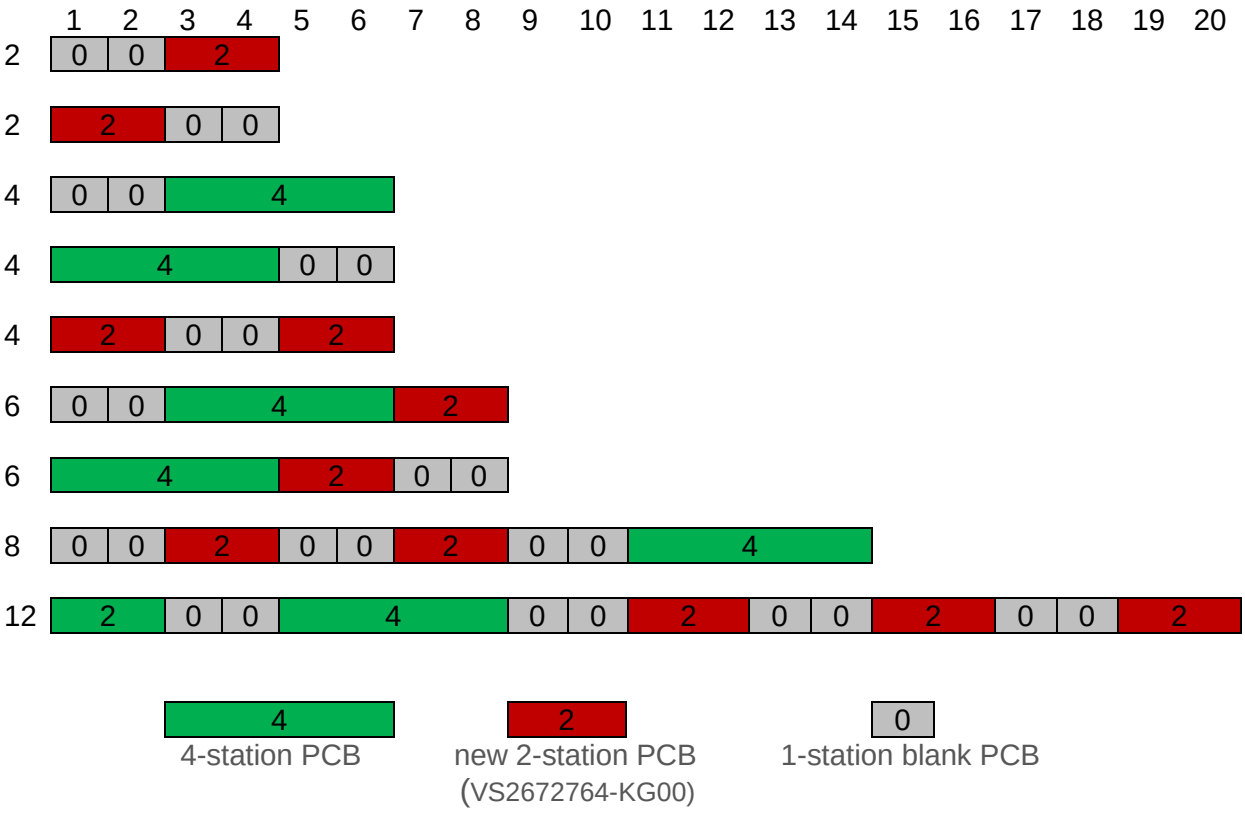


VS2672763-KG00

Up to 4 soft-start valves may be added at even positions (0, 2, 4, …20, 22, 24).

See below some configurations as examples when using the soft-start valve. Only number/ positions of valve slices + blanking plates + ISEM plates are counted with respect to station numbering in below configurations.

Note: Only the new 2-station PCB (VS2672764-KG00) should be used in the below configurations.



10 Electrical data

Details		Comments
Valve voltage range (VA)	24VDC +/-10%	PELV
Electronics voltage range (VB)	24VDC +/-25%	PELV
Maximal currents:	VA: 150mA + n x 30mA VB: 400mA	n = number of activated valves
Voltages are galvanic decoupled	Yes	--
Protection against polarity reversal	VA, VB	--
Overcurrent protection VB, VA	irreversible	Protection against overload and short-circuit currents, fused with 2A slow-acting fuse
PE/FE/Ground connection	M4 thread on the rear of the connection module	Reference section 2.1
Electrical power supply connection	M12 / 5-pin / A-coded / male connector	M12-1: L1 (VB+) M12-2: N2 (VA-) M12-3: N1 (VB-) M12-4: L2 (VA+) M12-5: FE
Bus connection	M12 / 4-pin / D-coded / female connector	M12-1: TD+ M12-2: RD+ M12-3: TD- M12-4: RD-

11 Technical data

11.1 Technical data VS18 and VS26

Medium:
Compressed air, filtered to 40µm, lubricated and non - lubricated

Operation:
VS18G / VS26G: Glandless spool valve, solenoid pilot actuated

VS18S / VS26S: Softseal spool valve, solenoid pilot actuated

Mounting:
Sub-base

Operating pressure:
Maximum pressure
10 bar VS18S / VS26S models and VS18G / VS26G solenoid pilot actuated valves with internal pilot supply
16 bar VS18G / VS26G solenoid pilot actuated valves with external pilot supply

Ambient temperature:
-15°C to +50°C

Medium temperature:
-5°C to +50°C (Consult our Technical Service for use below +2°C)

Materials:

Body/sub-base:	die-cast aluminium
Glandless spool & sleeve:	Aluminium, hard anodized, Teflon coated
Softseal spool:	Aluminium with HNBR seals
Plastic parts:	POM, PA, PPA
Mounting sheets / srews:	Steel, zinc coated
Springs:	Stainless steel
Sandwich plates:	Aluminium bar materials, PA
Electrical contacts:	Brass, tin coated
PCB:	Glass epoxy

11.2 Technical data VS18

Ports 2+4:
G1/8, NPTF 1/8, PIF 8 mm, PIF 6 mm, PIF 1/4

Valves:
ISO 15407-2 - 18 mm

Flow – values measured at 6 bar inlet pressure and with a pressure drop of 1 bar:

Series	Function	Q_N [L/min]	C_V [US Gal/min]	K_v [m³/h]
VS18G	5/2	550	0,56	0,48
VS18G	5/3	550	0,56	0,48
VS18S	2x2/2	550	0,56	0,46
VS18S	2x3/2	600	0,61	0,52
VS18S	5/2	650	0,66	0,57
VS18S	5/3	650	0,66	0,57

11.3 Technical data VS26

Ports 2+4:
G1/4, NPTF 1/4, PIF 10 mm, PIF 8 mm, PIF 3/8

Valves:
ISO 15407-2 - 26 mm

Flow – values measured at 6 bar inlet pressure and with a pressure drop of 1 bar:

Series	Function	Q_N [L/min]	C_V [US Gal/min]	K_v [m³/h]
VS26G	5/2	1000	1,02	0,87
VS26G	5/3	1000	1,02	0,87
VS26S	2x2/2	1150	1,17	1,00
VS26S	2x3/2	1250	1,27	1,09
VS26S	5/2	1350	1,37	1,18
VS26S	5/3	1350	1,37	1,18

Customer support

Email contact: Anfragen.Ventilteam@imi-precision.com

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