NORGREN

Operation & Service Manual

# Valve Island VS18 / VS26 with IO-Link interface


IMI

# Change history:

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

| Index | Chapter | Description of changes | Date | Name |
|---|---|---|---|---|
| A | All | Setup of initial version | 20/08/2020 | R.Bennett |
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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.

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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 IO-Link interface and to detect and resolve problems.

**Note:**

In addition to the specific information for the IO-Link 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:

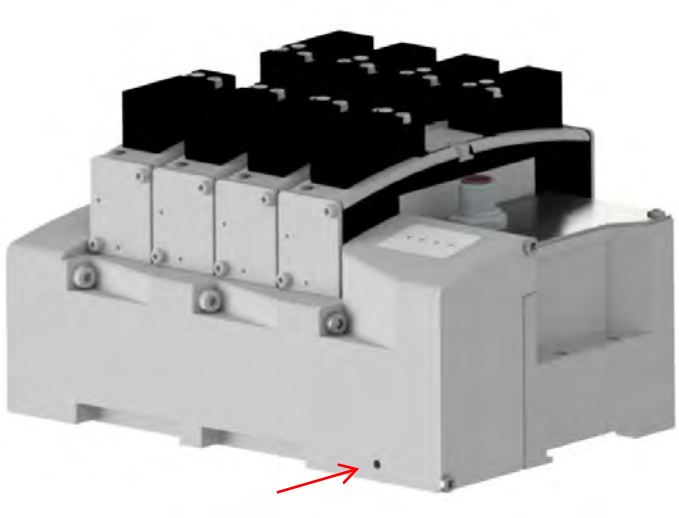
- *VS26: http://cdn.norgren.com/pdf/de_5_1_350_VS26.pdf*
- *VS18: http://cdn.norgren.com/pdf/de_5_1_250_VS18.pdf*

# 2 Important hints

## 2.1 Grounding and equipotential bonding

Proper grounding and equipotential bonding are very important to protect against electromagnetic interferences in IO-Link networks. In order to reduce potential impact, grounding of the IO-Link 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 IO-Link network and is essential to avoid equipotential bonding currents, which could otherwise flow through the IO-Link cable screen.

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. Cross section of the used cable should be at least 1,5 $mm^2$



## 2.2 Use of an IO-Link master with port class B

When connecting the VS18 or VS26 IO-Link valve islands, please note that an IO-Link master with port class B is required, which has on pin 2 and pin 5 of the M12 connector an additional, galvanically isolated supply voltage which can carry the maximum current needed for the used number of valve slices. The maximum current required for a specific configuration can be calculated depending on the existing valve solenoids according to the information in chapter 10.

## 2.3 Note with regards to delivery status in relation to expansion state

If changing the delivery status of the valve island in relation to the expansion stage - adding / reducing valve slices - it is necessary to switch the valve island completely free of voltage beforehand. It is recommended to remove the power supply plug. After adding / reducing valve slices, the new expansion stage must be initialized. The number of valve slices is determined during the power-up initialization. It is absolutely essential that the electronics power supply (VB) and the valve power supply (VA) are pressent during this initialization.

## 2.4 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.

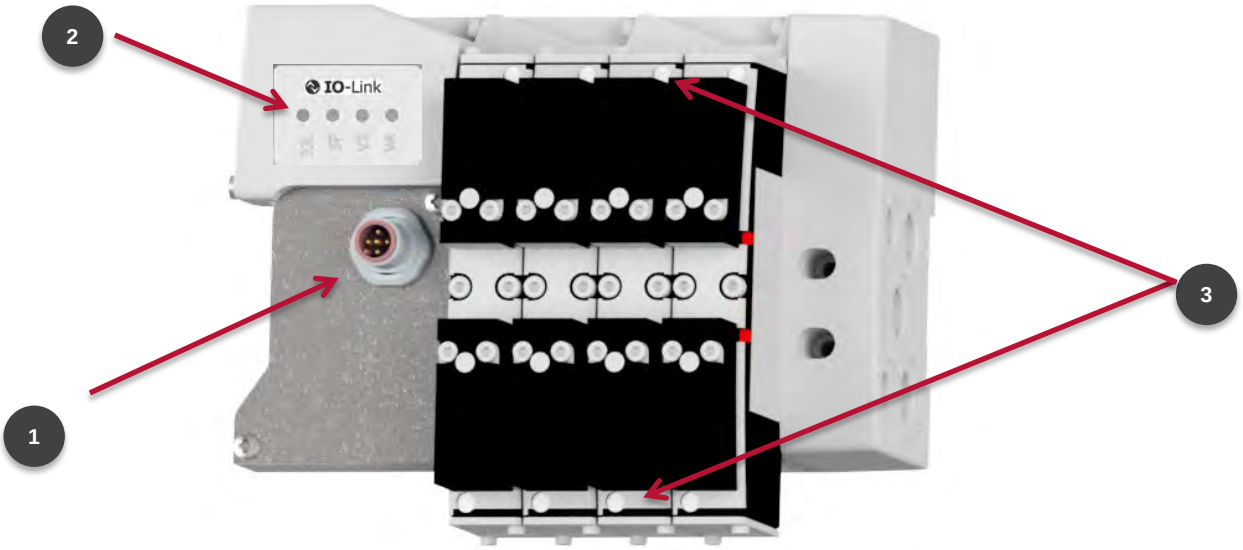
## 2.5 ATEX Valve Islands

Please refer to the ATEX Installation Instructions (7503767000000000) for IO-Link valve islands when used in Ex-environment.

You can access the ATEX Installation Instructions for IO-Link valve islands following the web link:

➲ *https://www.norgren.com/uk/en/technical-support/installation-maintenance-instructions/valves*

# 3 Electrical connections of the VS18 and VS26 Valve Islands

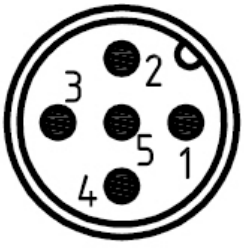



Top view

1. IO-Link connection (Port Class B)

   (Male M12, 5-pin, A-coded)
2. Valve Island status LEDs
3. Valve status LEDs

## 3.1 IO-Link Connection (Port Class B)




| M12 / 5-pin / connector / A-encoded | | |
|---|---|---|
| **Pin Nr.** | **Signal** | **Function** |
| 1 | L+ | Electronic Power Supply (VS+) |
| 2 | 2L+ | Valve Power Supply (VA+) |
| 3 | L- | Electronic Power Supply (VS GND) |
| 4 | C/Q | IO-Link communication |
| 5 | 2M | Valve Power Supply (VA GND) |

# 4 Commissioning

**Note:** The procedure for installing an IO-Link device depends on the configuration method. Please also read the manual of the IO-Link master.

**Note:** All examples in this document were created with the Siemens TIA Portal V15 and a Balluff IO-Link master. The example configurations of the valve island were created using the TMGTE IO-Link Device Tool.

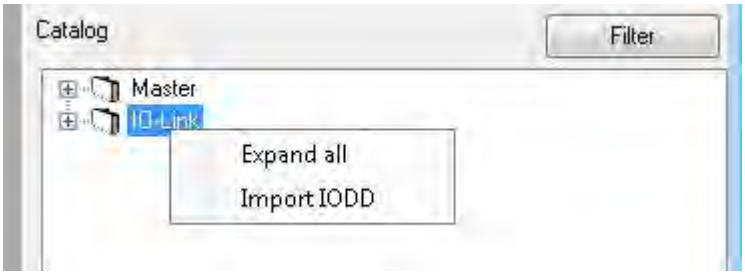
## 4.1 IODD (IO Device Description)

The IODD file contains all information on the communication properties, the device parameters, identification data, process data and diagnostic data of the valve island.

https://www.norgren.com/uk/en/technical-support/software

The configuration tools of the master vendors' are able to read an IODD and to display (partly graphically) the described device.

To do this, the IODD must be imported into the configuration tool of the master

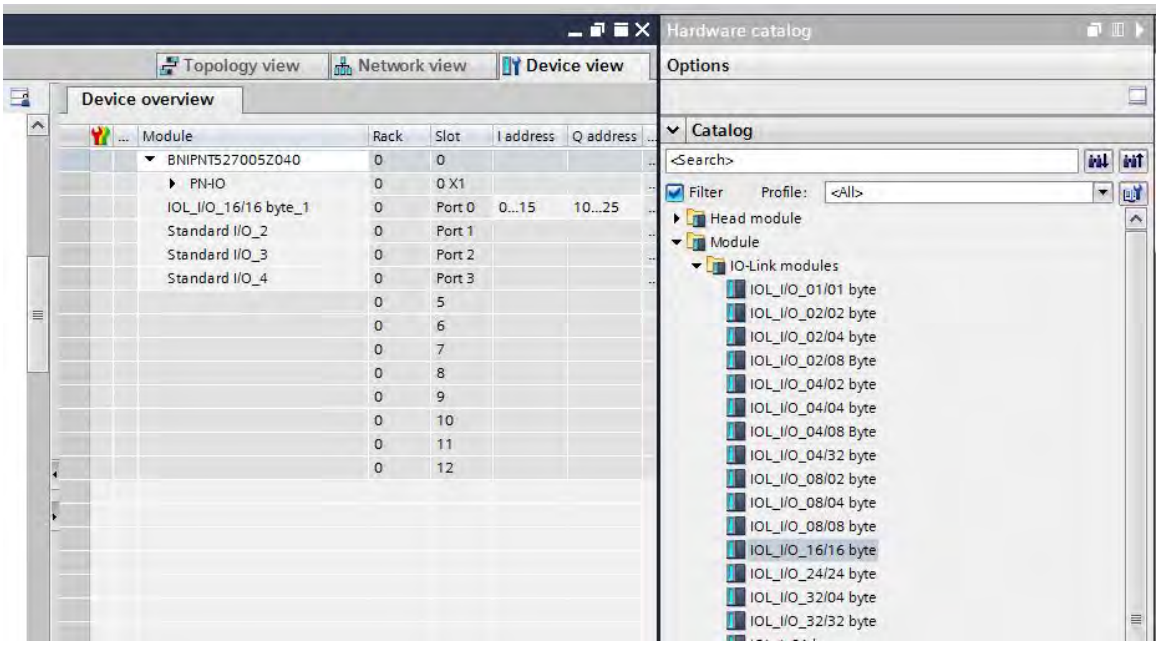



**Import of the IODD into the configuration tool of the IO-Link master**

## 4.2 Configuration of an IO-Link master port in the TIA Portal

The assignment of the valve island to an IO-Link port is carried out here as an example on a PROFINET IO-Link master from Balluff. After successful integration of the IO-Link master in the PROFINET network, the associated port to which the valve island is physically connected must be assigned a module with at least 10 bytes of input data and at least 5 bytes of output data.

The first possible module is in the following example: "IOL_I / O_16 / 16 byte"




**Assignment of an IO-Link module for the valve island to a master port**

## 4.3 Parameterrization of the Valve Island

The parameterization can be carried out, for example, via the web interface or via configuration software of the IO-Link master.

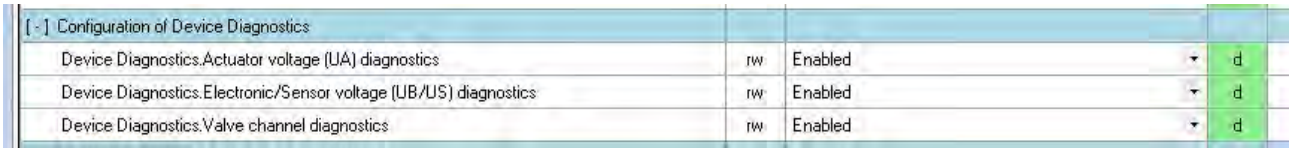
The configuration of the valve island distinguishes between the categories "device-specific parameters" and "channel-specific parameters".

### 4.3.1 Device-specific parameters

The following functions can be activated / deactivated here:

- *Voltage monitoring of the valve power supply 2L+ (VA)*
- *Voltage monitoring of the electronics / system power supply L+ (VS)*
- *Channel diagnosis of the valve slices*

When activated, the states of voltage monitoring and channel diagnostics are displayed via the respective LEDs and IO-Link events are generated.




**configuration of the device-specific parameters**

Default configuration: All three monitoring functions are enabled.

### 4.3.2 Channel-specific parameters

The following parameters can be configured for each individual coil (channel) on the valve island:

- *Activation of the channel*
- *Activation of the channel diagnosis (short circuit and wire break detection)*
- *Status at Failsafe: Substitute value behavior (clear output, set output or freeze output)*
- *Cycle Counter limit 1: can be set by the user*
- *Cycle Counter limit 2: can be set by the user*

| [ - ] Configuration Valve 1 Side 14 | | | | |
|---|---|---|---|---|
| Channel.Activate Valve 1 Side 14 | rw | activate channel | d | |
| Channel.Diagnostics Valve 1 Side 14 | rw | disable diagnostics | d | |
| Channel.Failsafe state Valve 1 Side 14 | rw | Off | d | |
| Channel.Counter Limit 1 Valve 1 Side 14 | rw | 0 | d | |
| Channel.Counter Limit 2 Valve 1 Side 14 | rw | 0 | d | |

**configuration of the device-specific paramters exemplary for valve 1-14**

Default configuration: All channel-specific diagnostic features are disabled

**Example Predictive Maintenance for the parameter counter switching cycles per solenoid (channel):**

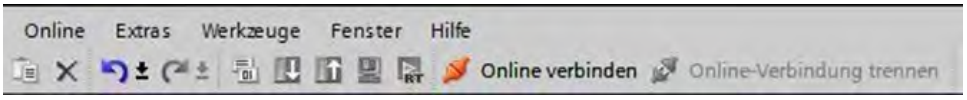
- ☐ Definition of limit 1 as a warning threshold per solenoid (channel)
  - o Checking wether the set waring threshold for an imminent maintenance request has been reached. Notification, that maintenance is due soon
- ☐ Definition of limit 2 as a maintenance request
  - o Checking whether maintenance is due. Notification, that the valve must be serviced or replaced

| Valve_ID | function_description | cycles | cyclespm | lim_value_amber | lim_value_red | ymb |
|---|---|---|---|---|---|---|
| V1_14 | SCENE 1 IN | 0 | 0 | 150 | 200 | ✓ |
| V1_12 | SCENE 1 OUT | 1 | 1 | 150 | 200 | ✓ |
| V2_14 | SCENE 2 IN | 1 | 1 | 150 | 200 | ✓ |
| V2_12 | SCENE 2 OUT | 0 | 0 | 150 | 200 | ✓ |
| V3_14 | RESERVE2 | 0 | 0 | 150 | 200 | ✓ |
| V3_12 | RESERVE2 | 0 | 0 | 150 | 200 | ✓ |
| V4_14 | RESERVE3 | 0 | 0 | 150 | 200 | ✓ |
| V4_12 | RESERVE3 | 0 | 0 | 150 | 200 | ✓ |
| V5_14 | RESERVE3 | 218 | 218 | 150 | 200 | ✗ |
| V5_12 | RESERVE4 | 217 | 217 | 150 | 200 | ✗ |
| V6_14 | RESERVE5 | 215 | 215 | 150 | 200 | ✗ |
| V6_12 | RESERVE5 | 216 | 216 | 150 | 200 | ✗ |
| V7_14 | RESERVE6 | 217 | 217 | 150 | 200 | ✗ |
| V7_12 | RESERVE6 | 217 | 217 | 150 | 200 | ✗ |
| V8_14 | RESERVE7 | 215 | 215 | 150 | 200 | ✗ |
| V8_12 | RESERVE7 | 215 | 215 | 150 | 200 | ✗ |
| V9_14 | RESERVE8 | 218 | 218 | 150 | 200 | ✗ |
| V9_12 | RESERVE8 | 217 | 217 | 150 | 200 | ✗ |
| V10_14 | LAST_SLICE1 | 215 | 215 | 150 | 200 | ✗ |
| V10_12 | LAST_SLICE2 | 216 | 216 | 150 | 200 | ✗ |

## 4.4 Firmware version and serial number

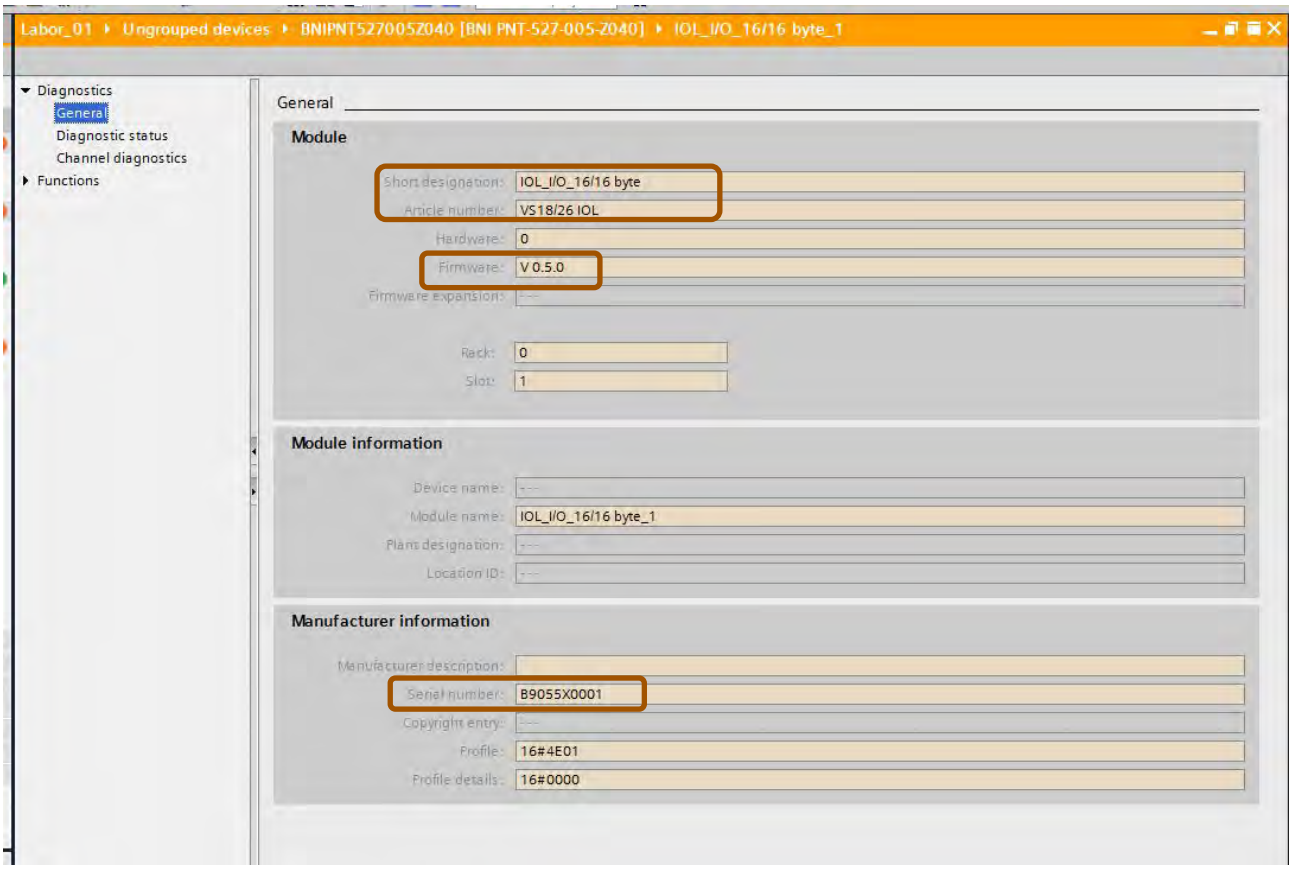
Via Siemens TIA Portal it is possible to determine the current firmware version and the serial number of the Valve Island.

Select the network view and press the "Connect online" button.




Double-click within the “device overview” on the port of the Valve Island. That leads you to the device diagnostics view.

Mark the line "General / General" to obtain detailed manufacturer information such as the firmware version or the serial number.




This information is also visible via the web interface or the configuration tool of the IO-Link master.

# 5 Process data

## 5.1 Output data

5 bytes are always reserved for output data. Depending on the selected conformation, the used bytes are calculated as follows:

$$B(Bytes) = \frac{V * 2 + \big((V * 2)MOD8\big)}{8}$$

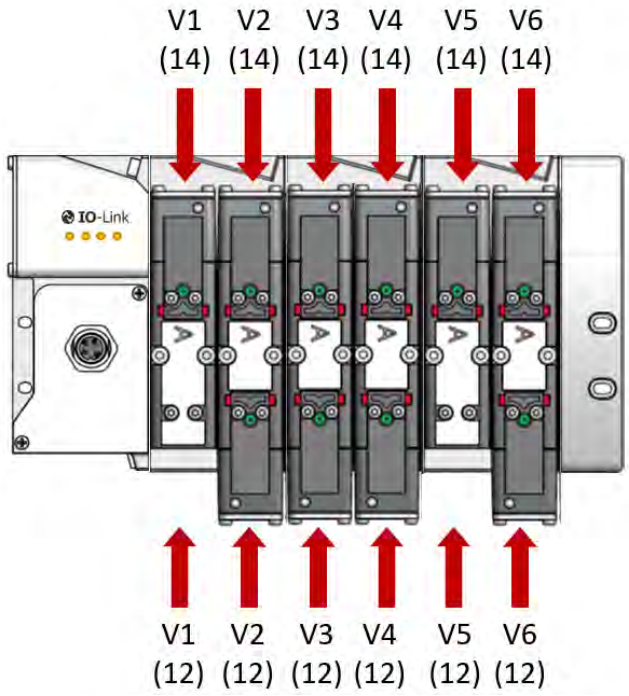
$$V \in \{4,6,8,10,12,14,16,18,20\}.$$

Whereby 'V' = number of valve slices and 'MOD' = modular operator

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

$$B = \frac{6 * 2 + (6 * 2)MOD8}{8} = \frac{12 + 12MOD8}{8} = \frac{16}{8} = 2$$

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




The picture shows a VS valve island with 6 valve slices

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

| byte | Bit | | | | | | | | Total number of valve slices | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 when switching on and in error status

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 IOL, SF, VS and VA (see also status LED description in chapter 6.1).

In case of fault condition (interrupted communication or process output data marked as invalid), the outputs switch to those values which are configured in the “substitute behavior” parameter set.

## 5.3 Input data

| Valve stations | | | | | Bit | | | | | | | | function |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-20 | 13-16 | 9-12 | 5-8 | 1-4 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
| Byte# | | | | | | | | | | | | | |
| | | | | 1 | V04-12 | V04-14 | V03-12 | V03-14 | V02-12 | V02-14 | V01-12 | V01-14 | Short circuit / overload |
| | | | 2 | | V08-12 | V08-14 | V07-12 | V07-14 | V06-12 | V06-14 | V05-12 | V05-14 | Short circuit / overload |
| | | 3 | | | V12-12 | V12-14 | V11-12 | V11-14 | V10-12 | V10-14 | V09-12 | V09-14 | Short circuit / overload |
| | 4 | | | | V16-12 | V16-14 | V15-12 | V15-14 | V14-12 | V14-14 | V13-12 | V13-14 | Short circuit / overload |
| 5 | | | | | V20-12 | V20-14 | V19-12 | V19-14 | V18-12 | V18-14 | V17-12 | V17-14 | Short circuit / overload |
| | | | | 6 | V04-12 | V04-14 | V03-12 | V03-14 | V02-12 | V02-14 | V01-12 | V01-14 | Open circuit |
| | | | 7 | | V08-12 | V08-14 | V07-12 | V07-14 | V06-12 | V06-14 | V05-12 | V05-14 | Open circuit |
| | | 8 | | | V12-12 | V12-14 | V11-12 | V11-14 | V10-12 | V10-14 | V09-12 | V09-14 | Open circuit |
| | 9 | | | | V16-12 | V16-14 | V15-12 | V15-14 | V14-12 | V14-14 | V13-12 | V13-14 | Open circuit |
| 10 | | | | | V20-12 | V20-14 | V19-12 | V19-14 | V18-12 | V18-14 | V17-12 | V17-14 | Open circuit |

# 6 Diagnostics and LEDs

## 6.1 Status LEDs


### 6.1.1 Status LEDs description

| LED Name | Description |
|---|---|
| IOL | IO-Link communication |
| SF | System error status |
| VS | Electronics power supply status L+ (VS+) |
| VA | Status valve power supply 2L+ (VA+) |

### 6.1.2 Description of the IO-Link LED (IOL)

| IO-Link Status | LED State |
|---|---|
| There is no communication | switched off |
| Communication active | flashing green |

### 6.1.3 Description of the system error status LED (SF)

| System Status | LED State |
|---|---|
| No system error | green |
| Fatal system error | red |
| Error at valve slice | flashing red |

### 6.1.4 Description of the electronics power supply status LED (VS)

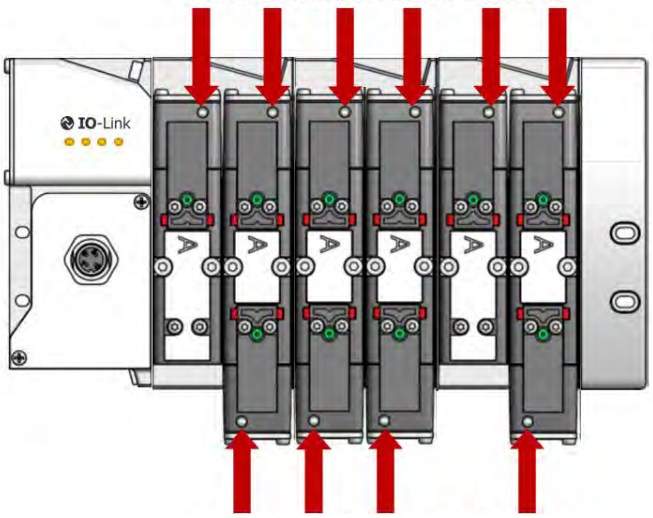
| Status | LED State |
|---|---|
| Voltage OK within the tolerance range of 18V-30V | green |
| Undervoltage | flashing red |
| Overvoltage | red |

### 6.1.5 Description of the valve power supply status LED (VA)

| Status | LED State |
|---|---|
| Voltage OK in within tolerance range of 21.6V-26.4V | green |
| Undervoltage | flashing red |
| Overvoltage | red |

## 6.2 Description of the status LEDs for the valve slices

Valve slice LEDs side 14




Valve slice LEDs side 12

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.
Monostable valve slices are equipped with one LED. These are green monocolor LEDs.

| Status | LED State |
|---|---|
| Valve not powered | off |
| Valve powered | on |

## 6.3 Diagnosis

The diagnosis of the valve island distinguishes between the categories "device-specific diagnosis" and "channel-specific diagnosis".

### 6.3.1 Device-specific daignosis

The device-specific diagnosis includes the following parameters:

- *Operating hours counter [h]*
- *Status of the electronics system voltage VS (over- / undervoltage, voltage OK)*
- *Status of the valve voltage VA (over / undervoltage, voltage OK)*

| [ - ] Device Diagnostics | | | | |
|---|---|---|---|---|
| Operating Hours | ro | 0,01 | d | h |
| Supply.Voltage status UB/US | ro | UB/US voltage in range | d | |
| Supply.Voltage status UA | ro | UA undervoltage | d | |

**Device Specific Diagnostics**

### 6.3.2 Channel-specific diagnosis:

For each solenoid (channel) on the valve island following diagnostic parameters are available:

- *Absolute number of switching operations.*
- *Overload monitoring of the channel*
- *Wire break monitoring on the channel*

| [ - ] Channel Diagnostics Valve 1 | | | | |
|---|---|---|---|---|
| Cycle counter.Switching cycles Valve 1 Side 14 | ro | 0 | d | |
| Diagnostics.Overload Valve 1 Side 14 | ro | OK | d | |
| Diagnostics.Openload Valve 1 Side 14 | ro | OK | d | |
| Cycle counter.Switching cycles Valve 1 Side 12 | ro | 0 | d | |
| Diagnostics.Overload Valve 1 Side 12 | ro | OK | d | |
| Diagnostics.Openload Valve 1 Side 12 | ro | OK | d | |

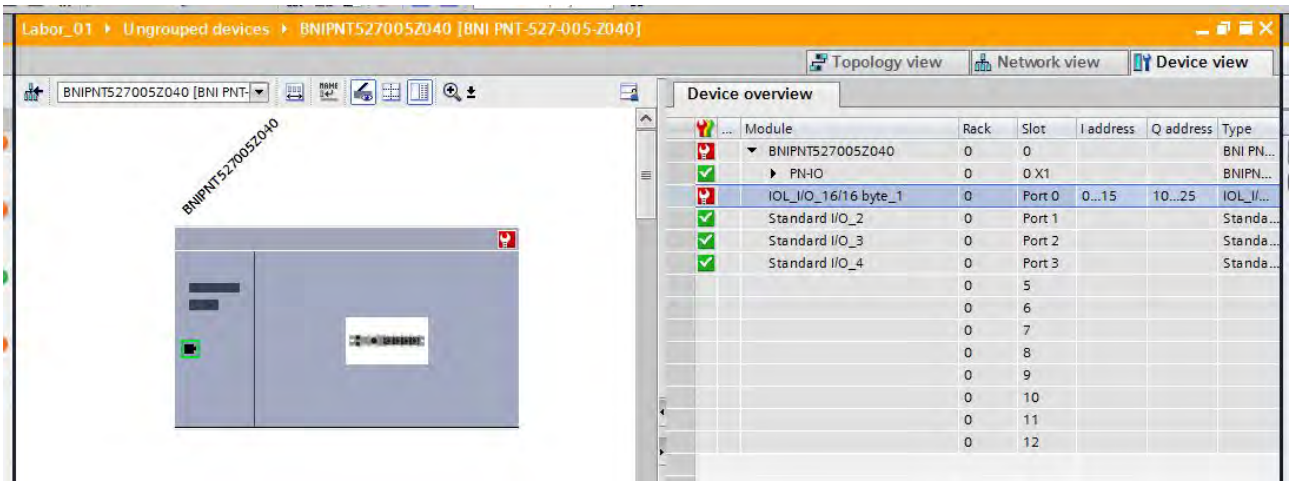
**Channel diagnosis of the first valve**

## 6.4 Online diagnosis with Siemens TIA Portal

Diagnostics of the network or devices is started by pressing the "Connect online" button.

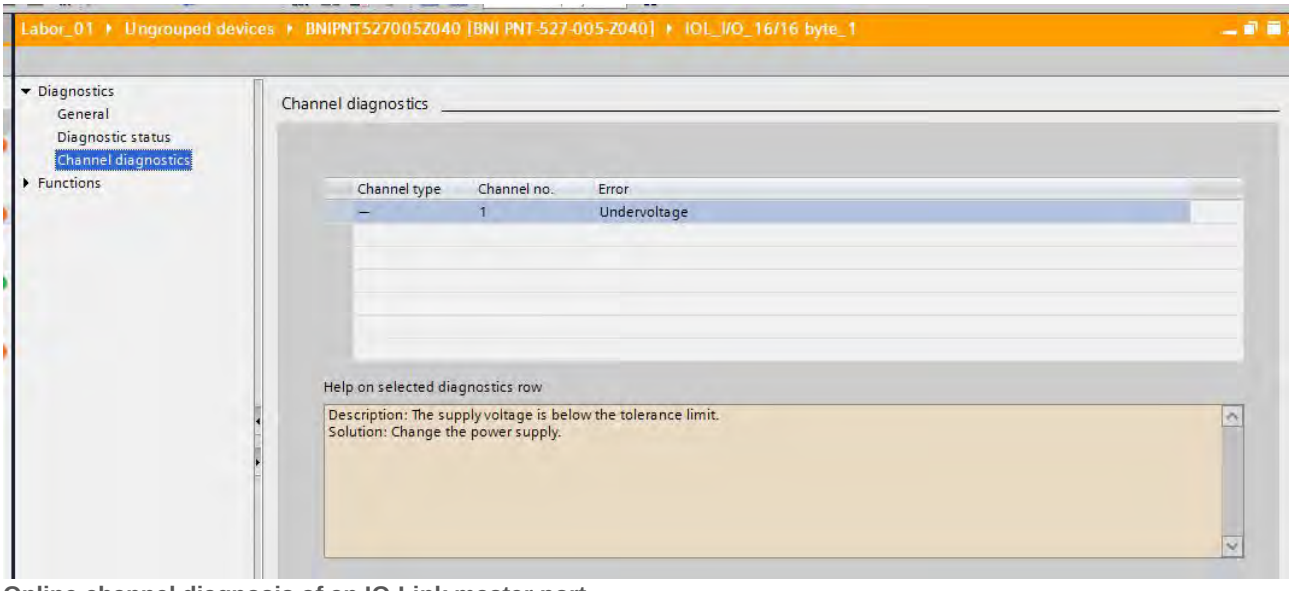
### 6.4.1 Channel diagnosis of the IO-Link master

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”.




**Online device diagnosis**

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.

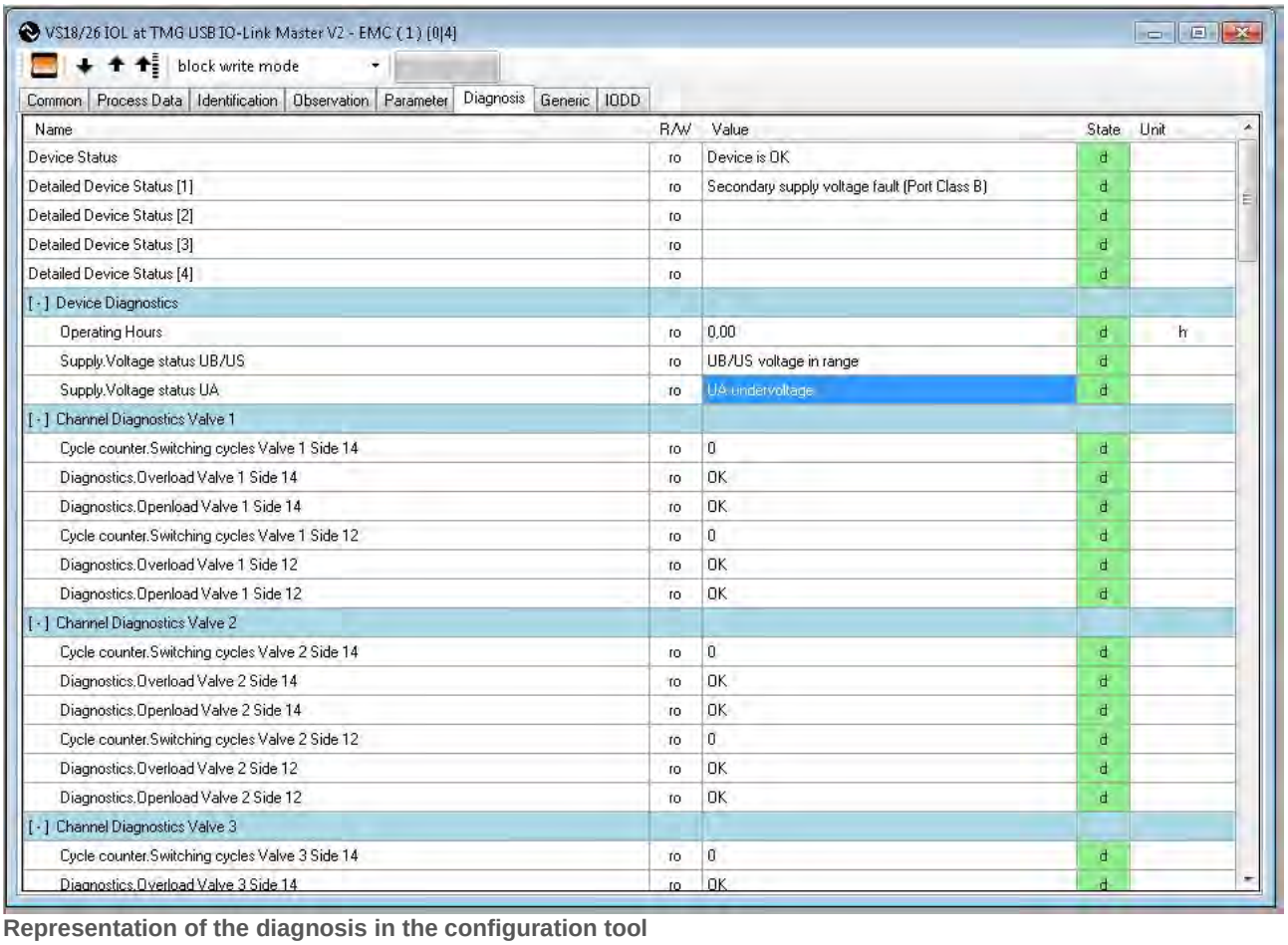



**Online channel diagnosis of an IO-Link master port**

## 6.5 Diagnostics with an IO-Link master configuration tool

The diagnostic data can be read out via the web interface or the configuration tool of the IO-Link master. This requires uploading the device parameters from the device to the tool.

The following figure shows an example of how a possible undervoltage of the valve power supply 2L + (VA +) is displayed in the configuration tool of the master.




| Name | R/W | Value | State | Unit |
|---|---|---|---|---|
| Device Status | ro | Device is OK | d | |
| Detailed Device Status [1] | ro | Secondary supply voltage fault (Port Class B) | d | |
| Detailed Device Status [2] | ro | | d | |
| Detailed Device Status [3] | ro | | d | |
| Detailed Device Status [4] | ro | | d | |
| [ - ] Device Diagnostics | | | | |
| Operating Hours | ro | 0,00 | d | h |
| Supply.Voltage status UB/US | ro | UB/US voltage in range | d | |
| Supply.Voltage status UA | ro | UA undervoltage | d | |
| [ - ] Channel Diagnostics Valve 1 | | | | |
| Cycle counter.Switching cycles Valve 1 Side 14 | ro | 0 | d | |
| Diagnostics.Overload Valve 1 Side 14 | ro | OK | d | |
| Diagnostics.Openload Valve 1 Side 14 | ro | OK | d | |
| Cycle counter.Switching cycles Valve 1 Side 12 | ro | 0 | d | |
| Diagnostics.Overload Valve 1 Side 12 | ro | OK | d | |
| Diagnostics.Openload Valve 1 Side 12 | ro | OK | d | |
| [ - ] Channel Diagnostics Valve 2 | | | | |
| Cycle counter.Switching cycles Valve 2 Side 14 | ro | 0 | d | |
| Diagnostics.Overload Valve 2 Side 14 | ro | OK | d | |
| Diagnostics.Openload Valve 2 Side 14 | ro | OK | d | |
| Cycle counter.Switching cycles Valve 2 Side 12 | ro | 0 | d | |
| Diagnostics.Overload Valve 2 Side 12 | ro | OK | d | |
| Diagnostics.Openload Valve 2 Side 12 | ro | OK | d | |
| [ - ] Channel Diagnostics Valve 3 | | | | |
| Cycle counter.Switching cycles Valve 3 Side 14 | ro | 0 | d | |
| Diagnostics.Overload Valve 3 Side 14 | ro | OK | d | |

**Representation of the diagnosis in the configuration tool**

# 7 IO-Link error codes

| IO-Link event code (hexadecimal) | Error Description | Associated LED |
|---|---|---|
| 0x0000 | OK, no errors | *„SF“ LED, green* |
| 0x7710 | Solenoid, short circuit | *„SF“ LED, flashing red* |
| 0x7700 | solenoid, open circuit | *„SF“ LED, flashing red* |
| 0x5111 | Undervoltage electronic power supply L + (VS +) | *„VS“ LED, flashing red* |
| 0x5110 | Overvoltage electronic power supply L + (VS +) | *„VS“ LED, red* |
| 0x5112 | Undervoltage valve voltage supply 2L + (VA +) | *„VA“ LED, flashing red* |
| 0x5112 | Overvoltage valve power supply 2L + (VA +) | *„VA“ LED, red* |

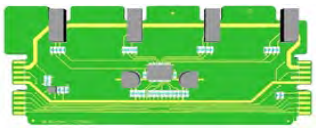
# 8 Properties of the IO-Link interface

| Details | | Comment |
|---|---|---|
| Protocol | IO-Link version 1.1 | --- |
| Baud rate | COM 3 (230.4 kBaud) | --- |
| Min. Cyclus time | 5ms | --- |
| IO-Link Port Class | Class B | --- |
| Language IODD | EN | --- |

# 9 Extension of the valve island

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

The following expansion boards are available :

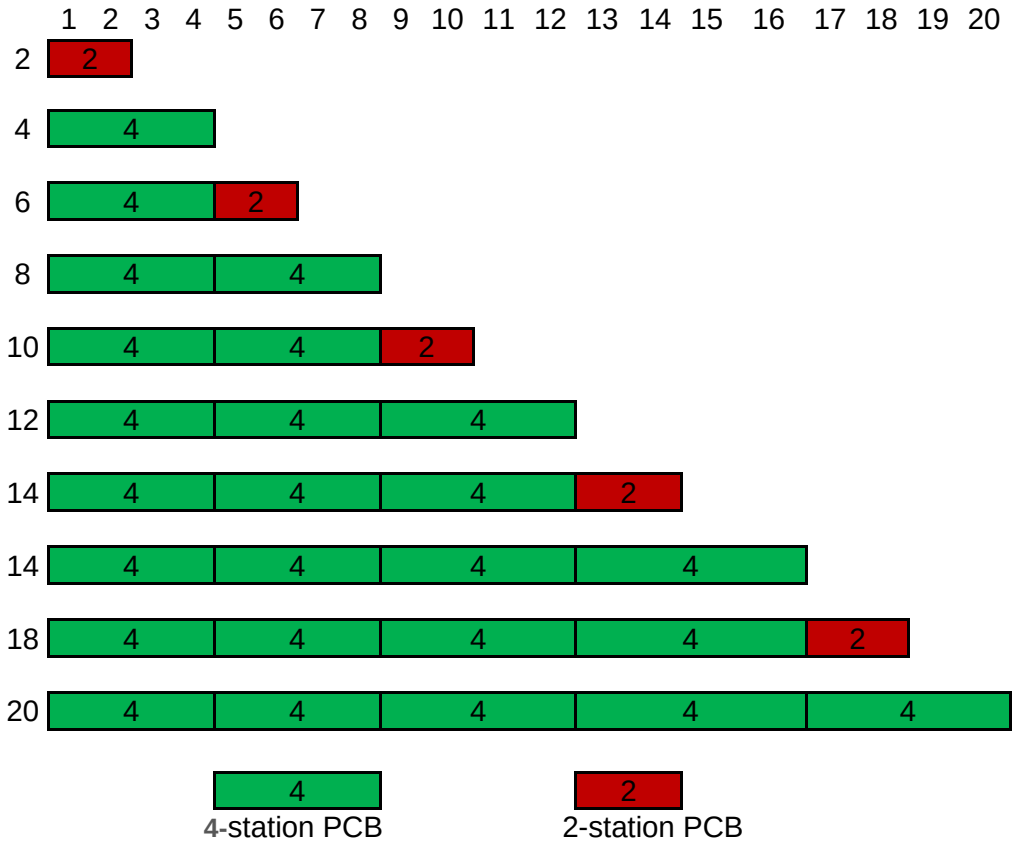


VS2672762-KG00 / VS1872262-KF00
4-station PCB

VS2672764-KG00 / VS1872264-KF00
2-station PCB

## 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

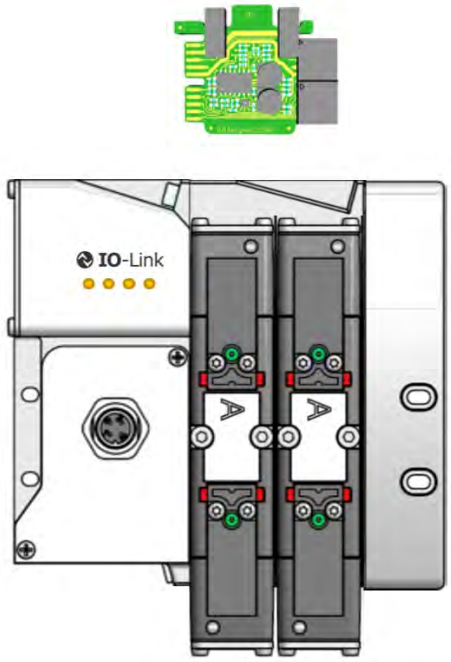


**Note :**

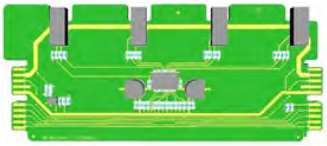
It is generally possible to use the 2-station PCBs (VS2672764-KG00 / VS1872264-KF00) on all positions but it is recommended to use the above combinations. In special cases with increased modularity requirements, the product support should be contacted.

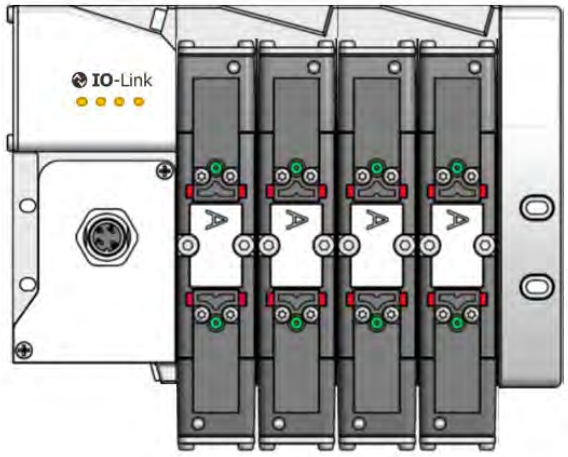
The below sections show the preferred combinations of the existing SPI boards for various valve island configurations.

## 9.2 Valve island with 2 stations

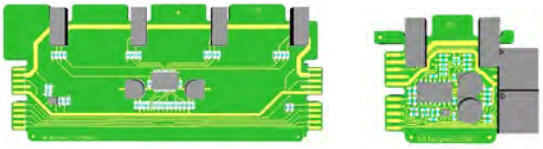


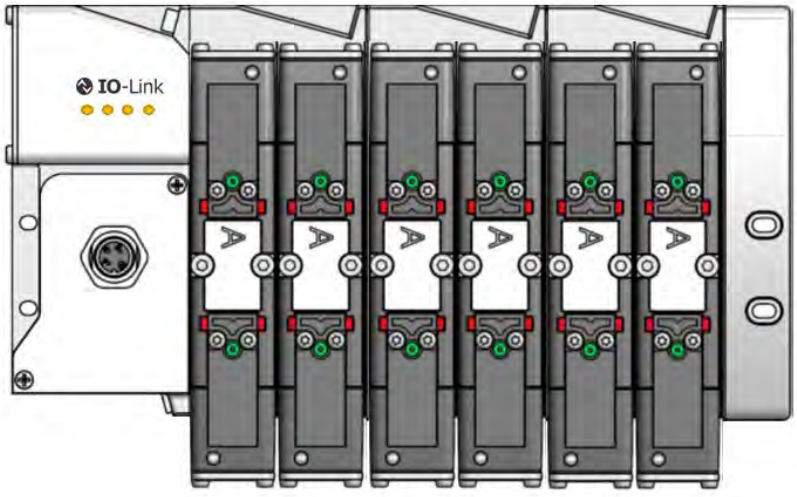
## 9.3 Valve island with 4 stations



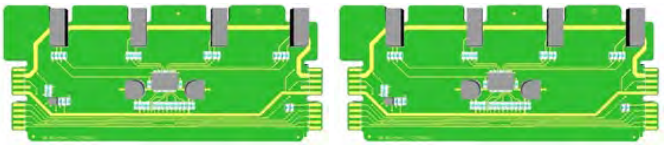


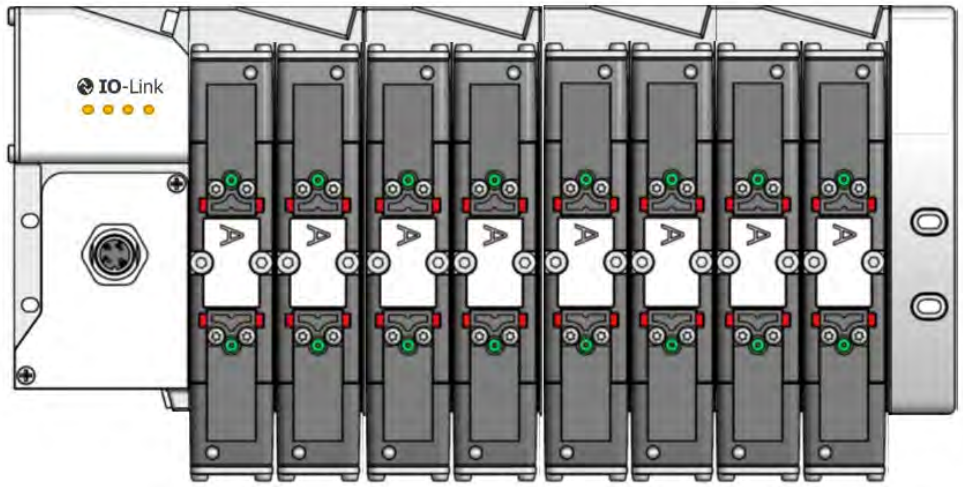

## 9.4 Valve island with 6 stations



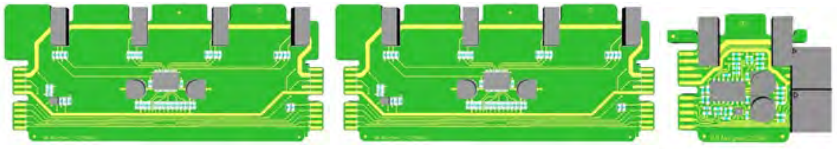


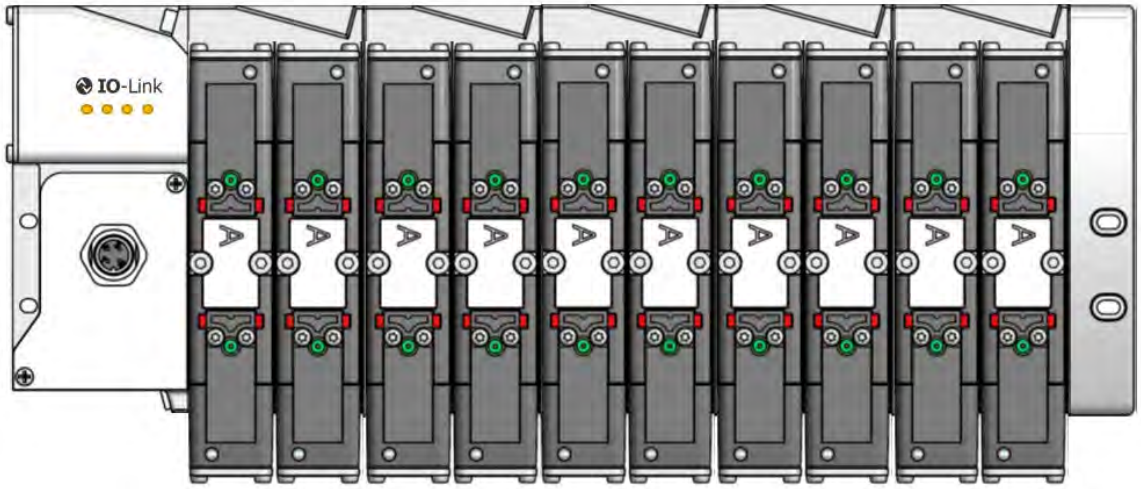
## 9.5 Valve island with 8 stations





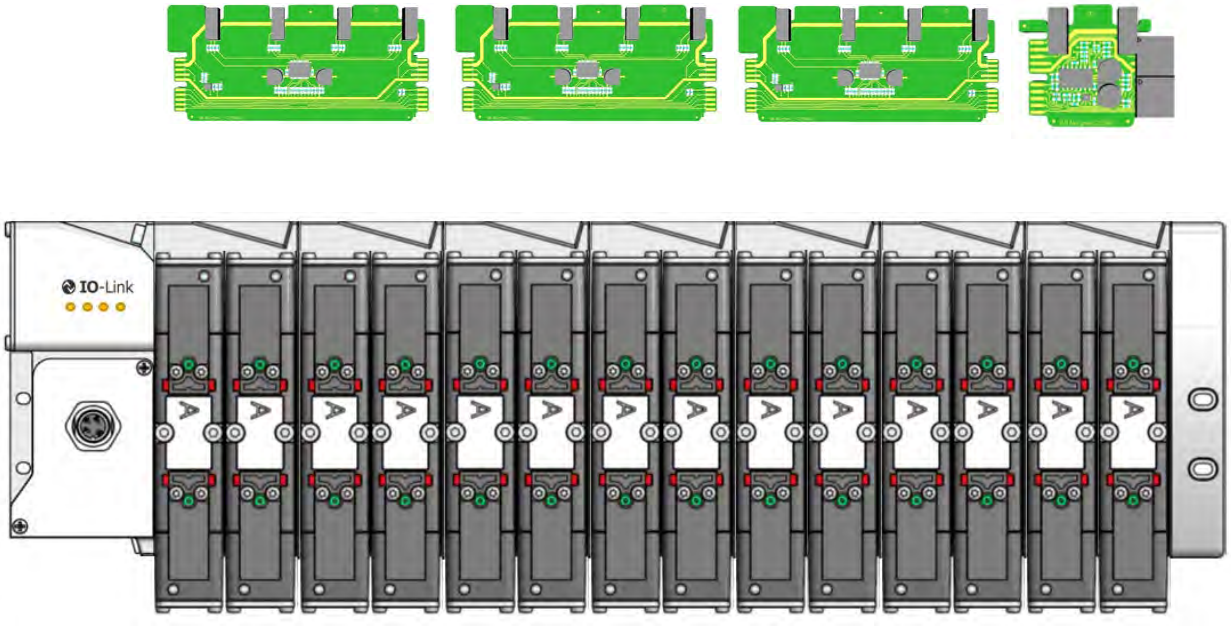

## 9.6 Valve island with 10 stations



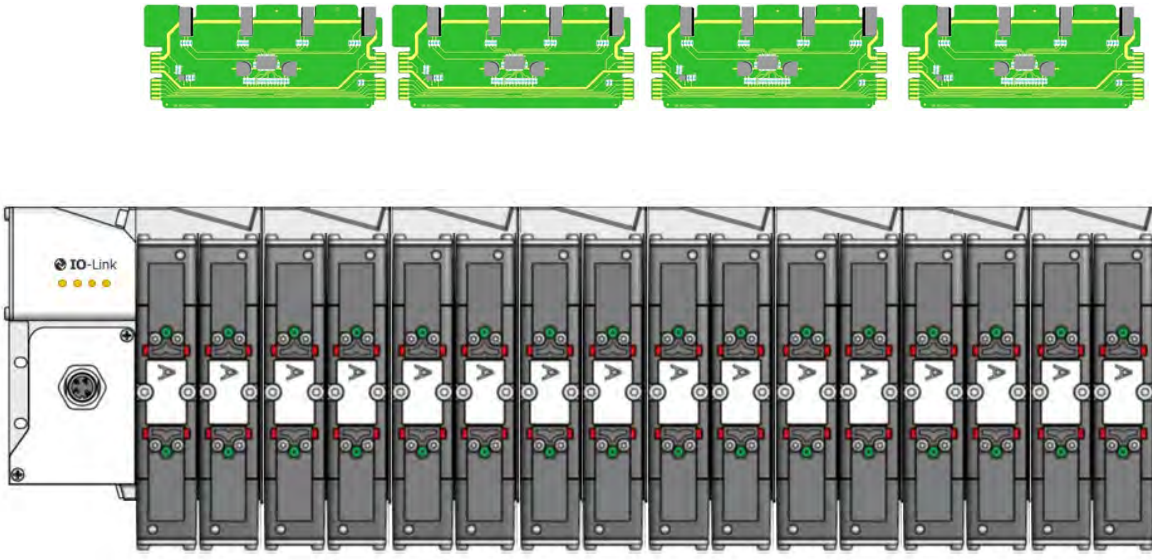


## 9.7 Valve island with 12 stations

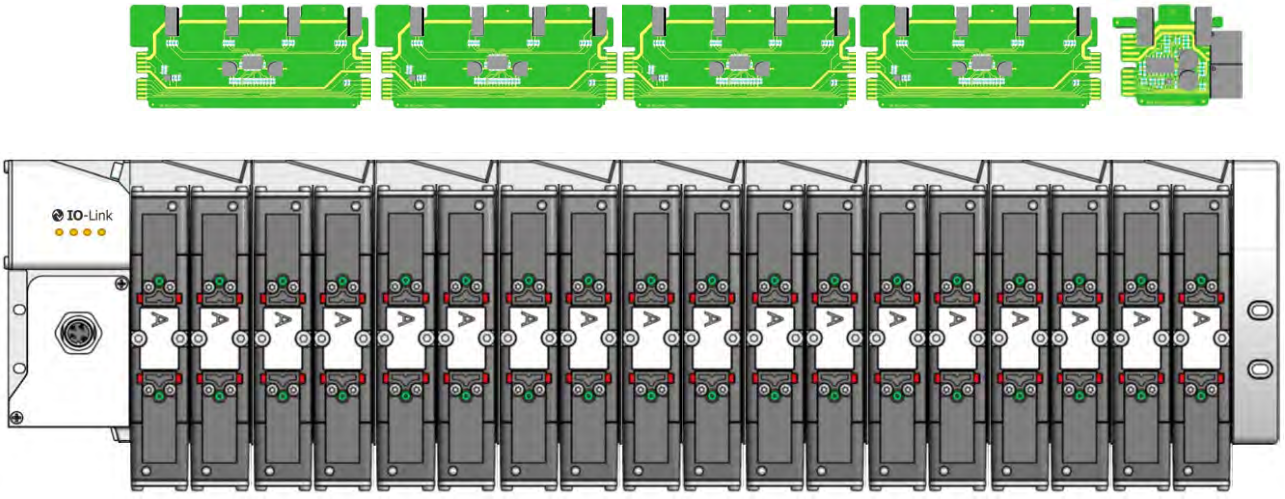

## 9.8 Valve island with 14 stations



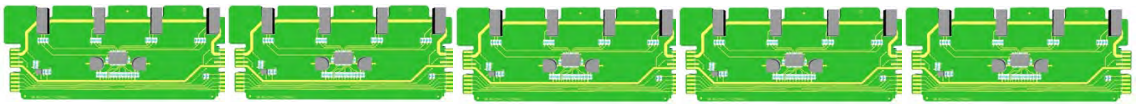
## 9.9 Valve island with 16 stations

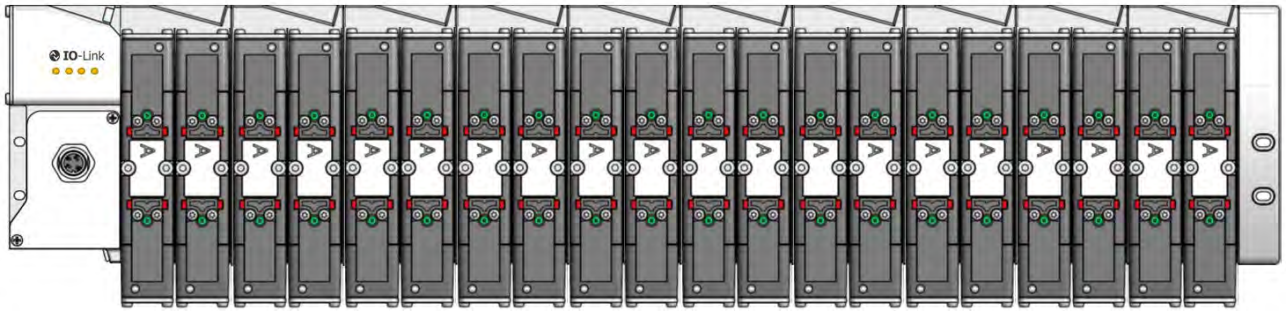



## 9.10 Valve island with 18 stations



## 9.11 Valve island with 20 stations

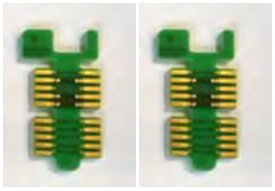





## 9.12 Usage of Soft-start valves

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

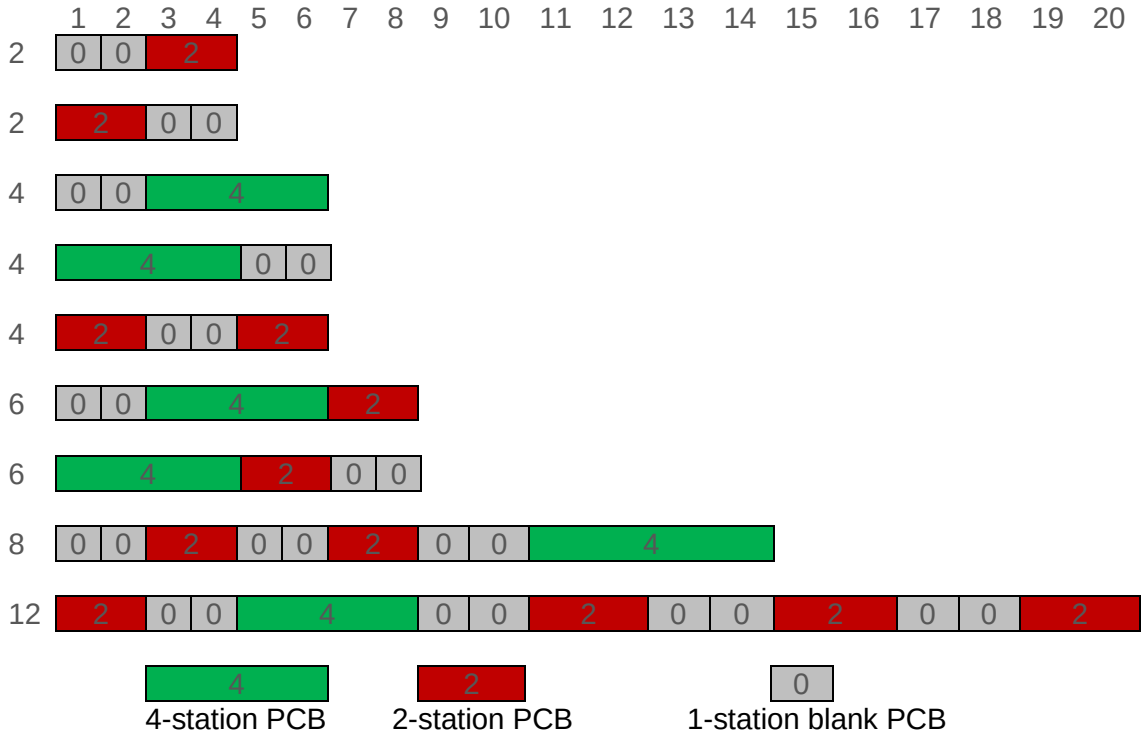


VS2672763-KG00

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



# 10 Electrical data

| Details | | comment |
|---|---|---|
| Voltage range valves (VA+): | 24VDC +/-10% | PELV |
| Voltage range electronics (VS+): | 24VDC +/-30% | PELV |
| Power consumption max: | VA: 25mA + n x 70mA<br>VS: < 250mA | n = number of switched valves |
| Voltages galvanically isolated | Yes | -- |
| Reverse polarity protection | VS+, VA+ | -- |
| Overcurrent protection VS, VA | Ireversible | Protection against thermal overload, i.e.overload and short circuit |
| PE / FE connection | Yes | via module housing |
| Electrical connection | M12 / 5-pin / A-coded / male | M12-1: L+ (VS+)<br>M12-2: 2L+ (VA+)<br>M12-3: L- (VS GND)<br>M12-4: C/Q<br>M12-5: 2M (VA GND) |

# 11. Technical data

## 11.1 Technical data VS18 und 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 6 mm, PIF 8 mm, PIF 1/4

**Ports 1 + 3 + 5:**
G1/4

**Valves:**
ISO 15407-2 - 18 mm

**Flow rate:**

| 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

**Ports 1 + 3 + 5:**
G3/8

**Valves:**
ISO 15407-2 – 26 mm

**Flow rate:**

| 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

www.norgren.com

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