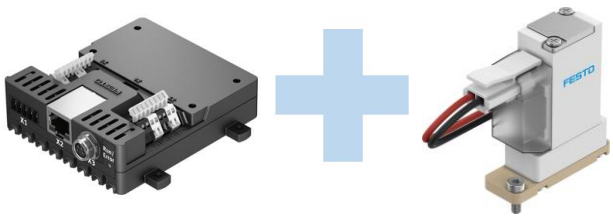
Application Note

FESTO

Media separated solenoid valve VYKB-F.. in combination with the valve-control module VAEM-V-S8EPRS2

The Application Note describes how VYKB-F.. and VAEM-V-S8EPRS2 are used in combination.

VYKB-F...
VAEM-V- S8EPRS2



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1 Components/software used

Type/name	Software/firmware version	Date of manufacture
Valve control module VAEM GUI	1.1.4.0 and above (current version: 1.2.4.0)	2019-10-30 (2021-06-11)
VAEM-V-S8...	1.2.3.0	2020-08-19
VYKB-F10-*-16-*-1* (24 V)		
VYKB-F10-*-16-*-5* (12 V)		
VYKB-F12-*-20-*-1* (24 V)		
VYKB-F12-*-20-*-5* (12 V)		

Table 1.1: Components/software used

Type codes

001	Series	
VYKB	Solenoid valve VYKB	

002	Directional control valve type	
F	Flanged valve	

003	Size	
10	Size 10	
12	Size 12	

004	Valve function	
M22C	2/2-way valve, normally closed	
M32	3/2-way valve, normally closed or open	

005	Nominal width	
20	2 mm	
16	1.6 mm	

006	Housing material	
P	PEEK	

007	Diaphragm and sealing material	
E	EPDM	
F	FFPM	
V	FPM	

008	Nominal operating voltage	
1	24 V DC	
5	12 V DC	

009	Electrical connection	
HP	Port pattern HP	

010	Outlet direction of electrical components	
A	Angled	
S	Straight	

Figure 1-1: Type code VYKB

2 Note

Only voltage-controlled operation with the 24 V DC variant is possible when using the valve control module VAEM-V-S8... with the media separated solenoid valves VYKB-F*.

This means that the Hit-and-Hold function cannot be implemented at the VAEM with the 24 V variants, because it is already permanently integrated in the VYKB series.

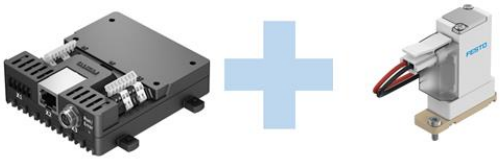
The valves are thus activated at the specified nominal voltage (supply voltage of the VAEM) throughout the complete activation period and internal VYKB electronics regulate the inrush current and holding current phases.

Actuation of the 12 V DC variants is not possible with the actuation module VAEM-V-S8....

The VAEM is supplied with 24 V on the supply side. The VAEM generates a pulse-width modulation (PWM) signal to output the 12 V. The combination of the PWM signal of the VAEM and the PWM signal of the VYKB causes an undefined response that may have a negative influence on the safe switching of the valve.

For this reason the use of the VAEM-V-S8... in combination with the VYKB 12V DC variants is NOT possible!

VYKB-F10-*-16-*-1* (24V)



VYKB-F10-*-16-*-5* (12V)

=› NOT possible

VYKB-F12-*-20-*-1* (24V)

VYKB-F12-*-20-*-5* (12V)

=› NOT possible

3 Installation

The following wiring is required in order to guarantee trouble-free operation.

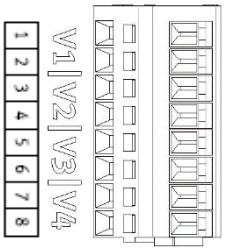
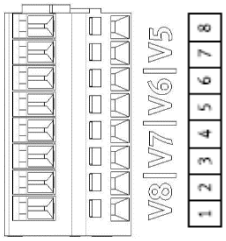
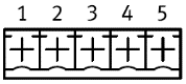
VYKB-F... (24 V)			VAEM-V-S8...		
Symbol	**Connec-tion**	**Function**	**Connection**	**Function**	**Symbol**
	RD	Power supply valve 1	X5 – pin 1	Power supply valve 1	
			X5 – pin 2	Not connected	
	RD	Power supply valve 2	X5 – pin 3	Power supply valve 2	
			X5 – pin 4	Not connected	
	RD	Power supply valve 3	X5 – pin 5	Power supply valve 3	
			X5 – pin 6	Not connected	
	RD	Power supply valve 4	X5 – pin 7	Power supply valve 4	
			X5 – pin 8	Not connected	
			X6 – pin 8	Not connected	
	RD	Power supply valve 5	X6 – pin 7	Power supply valve 5	
			X6 – pin 6	Not connected	
	RD	Power supply valve 6	X6 – pin 5	Power supply valve 6	
			X6 – pin 4	Not connected	
	RD	Power supply valve 7	X6 – pin 3	Power supply valve 7	
			X6 – pin 2	Not connected	
	RD	Power supply valve 8	X6 – pin 1	Power supply valve 8	
	BK	Earth valves 1 – V 8	X1 – pin 2	Earth valves 1 – V 8	

Table 3.1: Installation

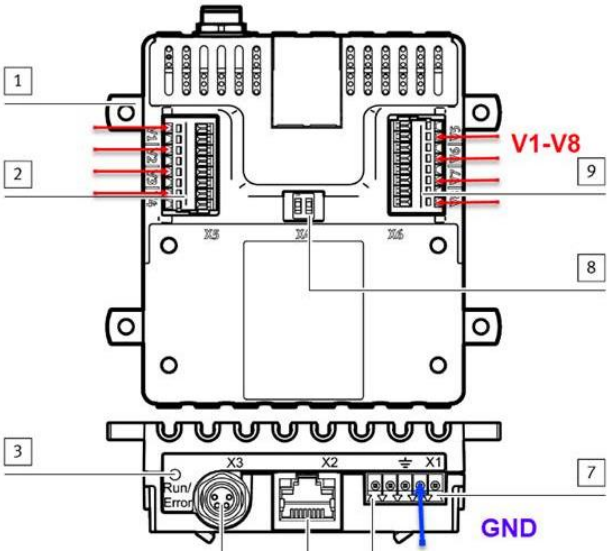


Figure 3-1: Product design

4 Software setting

The following settings are required in order to guarantee trouble-free operation.

4.1 Download GUI

Download and unpack valve control module VAEM GUI from the Festo Support Portal.

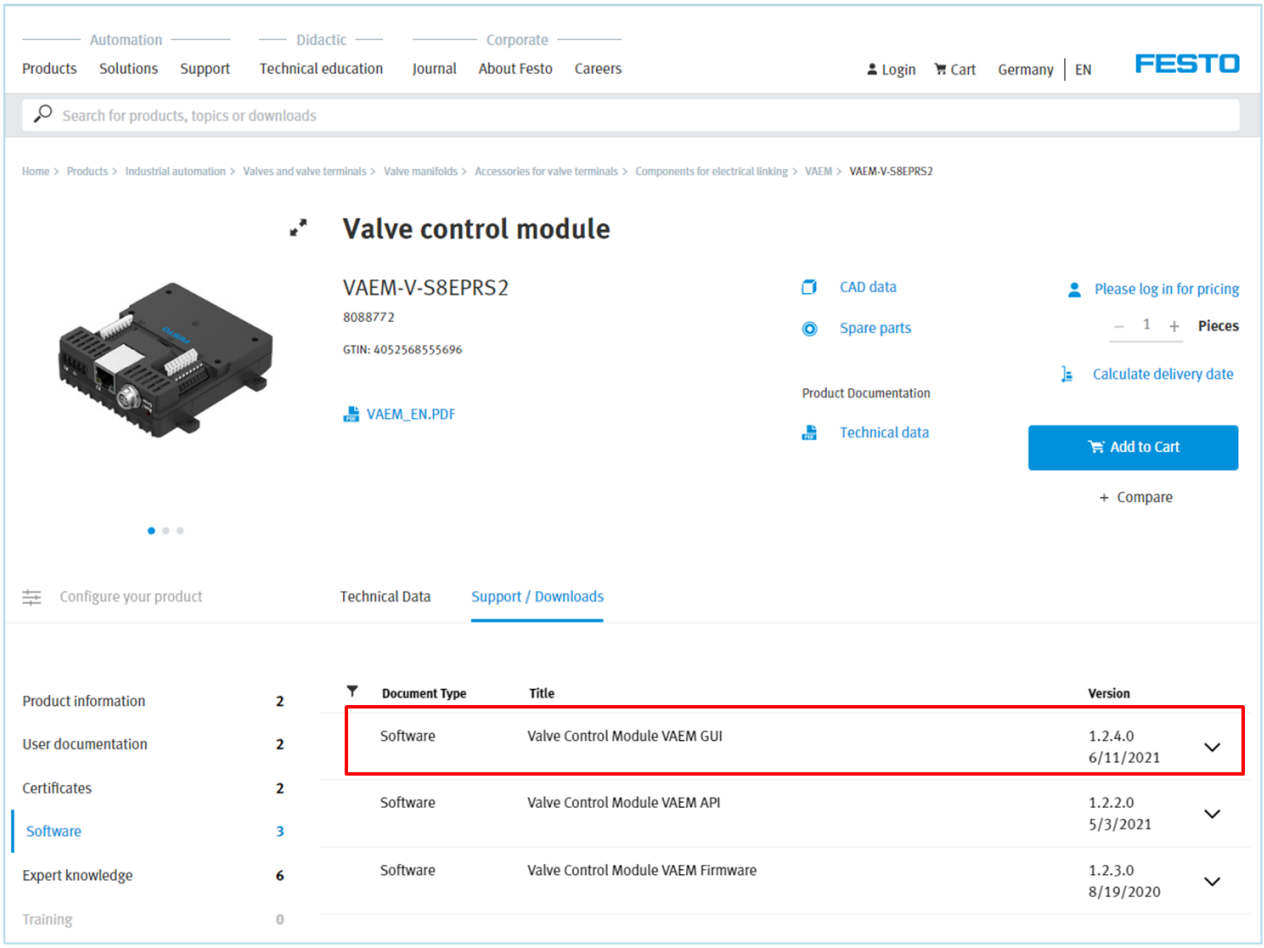


Figure 4-1: GUI

4.2 Disable error handling

Establish communications connection between VAEM-V-S8... and GUI.

4.2.1 Adapt object

Data type: UINT08
Index: 45
Subindex: 0
Value: 1

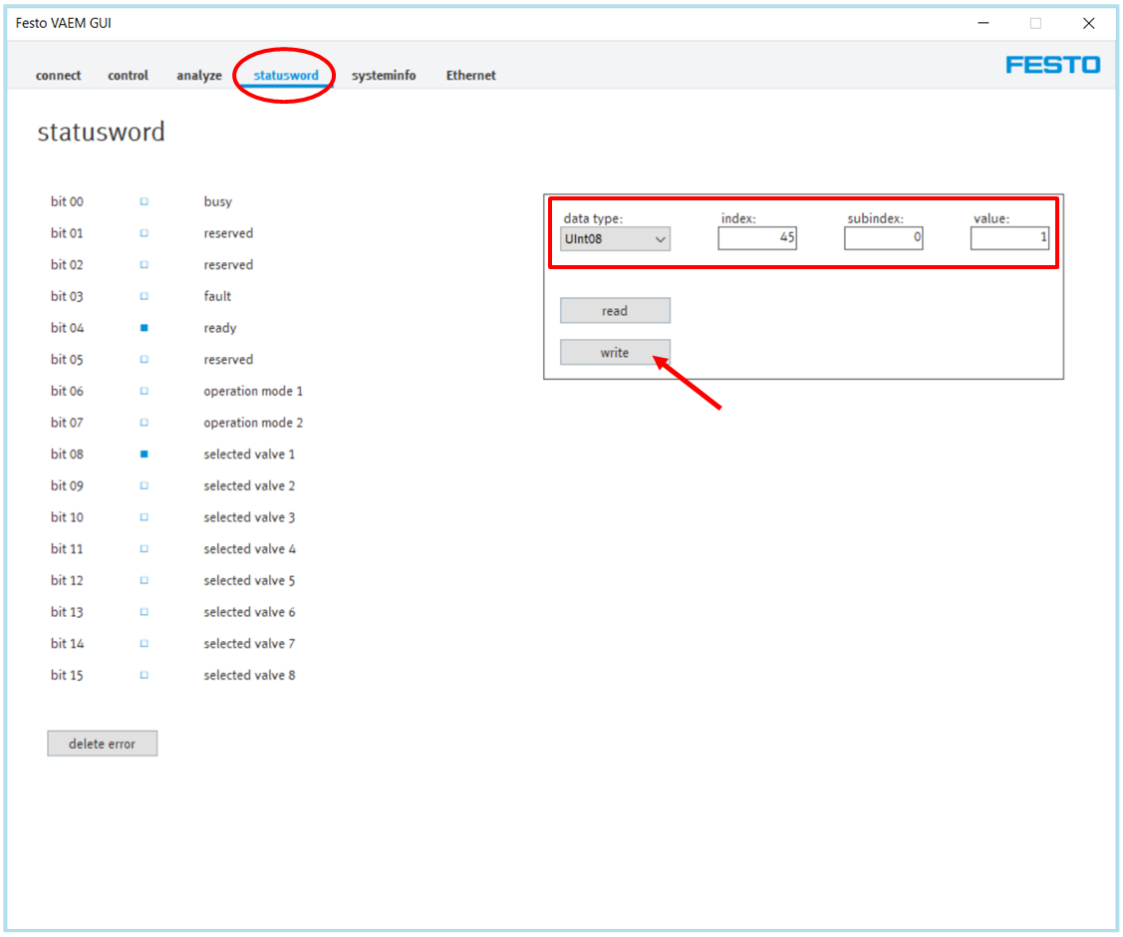


Figure 4-2: Status word

In standard operation (status word value: 0), the error detection is working via the ground pin of the switching outputs of the VAEM.

To bypass the Hit-and-Hold function, the ground pin of the valve must be directly connected to the supply ground of the VAEM.

In the standard operation of the VAEM, this special connection would action an error message.

By writing the status word in value:1, the error detection of the VAEM is deactivated.

Error detection can only be activated or deactivated for all valves (VAEM version 1.2.3.0).

4.2.2 Flash memory/electrical parameterisation

VYKB-F10-*-16-*-1* (24 V):

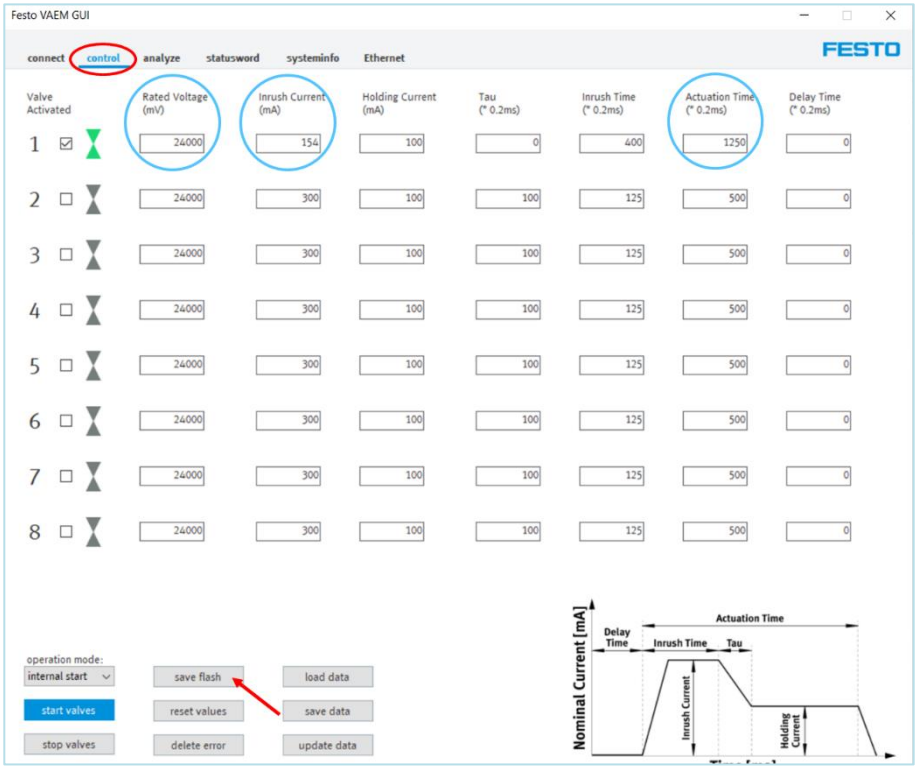


Figure 4-3: Setting VYKB-F10-* (24 V)

VYKB-F12-*-20-*-1* (24 V):

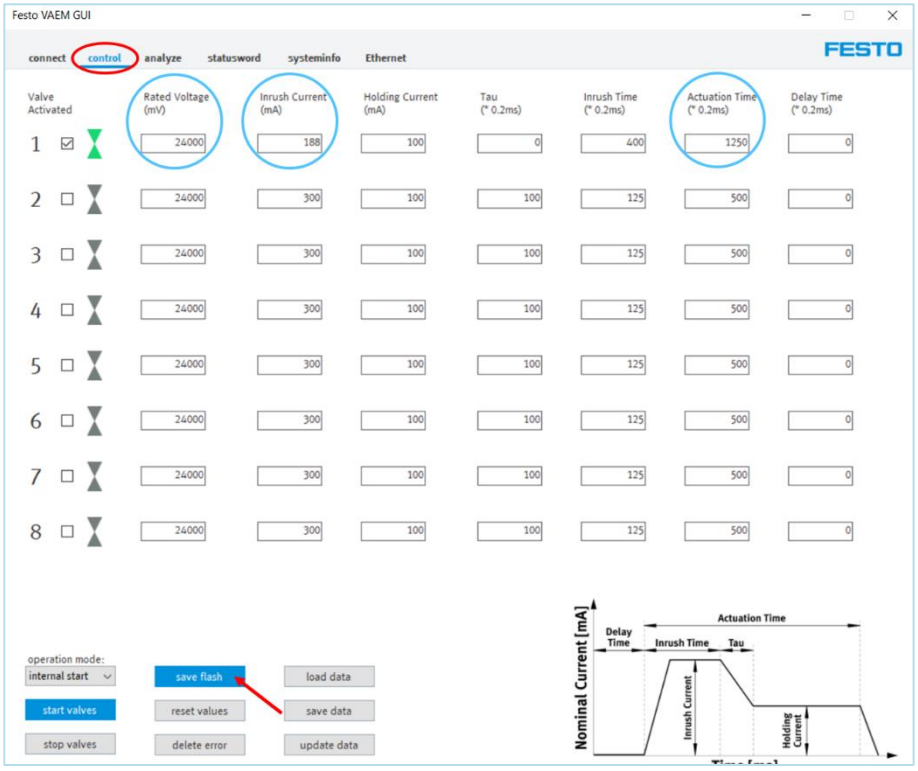


Figure 4-4: Setting VYKB-F10-* (24 V)

The **nominal voltage** should be set to the voltage of **24 V DC** specified in the datasheet (here in mV).

The **inrush current** (in mA) should be set to at least the value specified in the datasheet (VYKB-F10-* (**154 mA**); VYKB-F12-* (**188 mA**)). In order to guarantee safety the maximum possible inrush current can be input, because the VYKB electronics regulates the inrush and holding current internally.

The **activation time (in*0.2 ms)** is the total switching time of the valve for the VYKB. It should be at least the switching time specified in the datasheet (e.g.: with EPDM diaphragm material: **switching time on (=15 ms)**). The inrush and holding current phase is regulated by the VYKB electronics and is activated after the time specified in the datasheet.

The values for **Holding Current**, **Tau** and **Inrush Time** are irrelevant in this application and do not need to be taken into account, as the valve's electronics generate this themselves.

The **Delay Time** can be defined as usual.

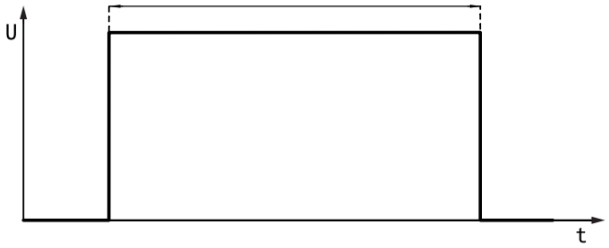


Figure 4-5: VAEM setpoint signal

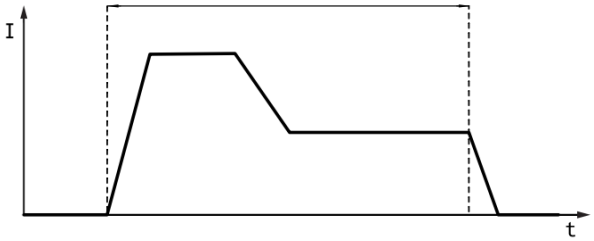


Figure 4-6: Actual signal of the VYKB electronics