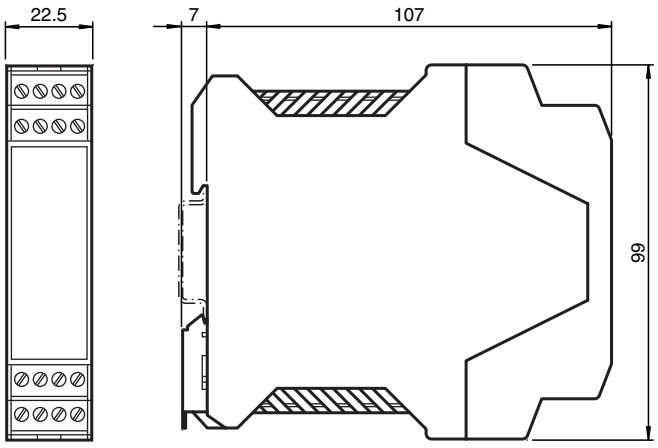
AS-Interface safety module
VBA-4E2A1A-KE3-ZEL/E2L/SEL

- Safety output module with diagnostic node and I/O node
- 1 enabling circuit with 2 safe electronic outputs
- Assigns a complete address and two A/B addresses
- 1st A/B address: 3 standard inputs and 1 EDM input (I/O node)
- 2nd A/B address: diagnostics and operational switching of the safe outputs (diagnostic node)
- Applications up to category 4/PL e/SIL 3

KE3 switch cabinet module, 1 safety-related electronic output, 4 standard inputs, 2 standard outputs

The AS-Interface safety output module VBA-4E2A1A-KE3-ZEL/E2L/SEL is a control cabinet module with two safe electronic outputs. The outputs are dependent on a common safe release circuit, but they can be switched separately from each other by conventional output bits as long as the release from the safety monitor is present. In addition, the module has an A/B node for diagnostics and a second A/B node for the connection of three conventional inputs and the contactor feedback circuit EDM.
The housing is only 22.5 mm wide and takes up little space in the switch cabinet. A snap-on function mounts the module onto the 35 mm mounting strip in line with EN 50022.
An addressing socket is integrated into the module. Access to the addressing of the safe output and the integrated A/B nodes is done by switching the programming switches.
The connection is made via plug-in terminals. Four-way (black) terminal blocks are used for the inputs. The AS-Interface is connected via a two-way terminal block (yellow). This allows the sensors or the power supply to be easily separated for commissioning or service. Power is supplied to the inputs and connected sensors by an external auxiliary power supply. Yellow LEDs display the current switching status of the inputs and outputs. The red LED FAULT displays communication errors and indicate that the A0 output bit is set. A green LED ASI displays the operating voltage and the address 0.

Dimensions



Technical Data

General specifications		
Node type		A/B node, standard node
AS-Interface specification		V3.0
Required master specification		≥ V2.1
Functional safety related parameters		
Safety Integrity Level (SIL)		SIL 3
Performance level (PL)		PL e

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Technical Data

Mission Time (T_M)		20 a
PFH_d		1.91 E-9
PFD		5.94 E-7
Indicators/operating means		
LED FAULT		error display; LED red red: communication error
LED PWR		AS-Interface voltage; LED green
LED IN		switching state (input); 4 LED yellow
LED OUT		For flashing patterns see diagnostics table
Electrical specifications		
Auxiliary voltage (input)	U_{EXT}	24 V ± 20 % PELV
Rated operating voltage	U_e	26.5 ... 31.6 V from AS-Interface
Rated operating current	I_e	< 200 mA
Protection class		III
Surge protection		U_{EXT}, U_e: Over voltage category III, safe isolated power supplies (PELV)
Input		
Number/Type		3 standard inputs, 1 EDM input
Supply		from external auxiliary voltage U_{AUX}
Voltage		24 V DC
Input current		Static switching current: 4 mA at 24 V. Dynamic switching current: 15 mA at 24 V (T=100 µs)
Sensor supply		≤ 100 mA
Output		
Number/Type		2 output switch elements Max contact load: 0.5 A DC-13 at 30 V 1 safe electronic output
Supply		from external auxiliary voltage U_{AUX}
Directive conformity		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 62026-2:2013 EN 61000-6-2:2005/AC:2005 EN 61000-6-3:2007/A1:2011
Standard conformity		
Electromagnetic compatibility		EN 61326-3-1:2008
Degree of protection		EN 60529:2000
Electrical safety		EN ISO 13849-1:2008 EN ISO 13849-2:2012
Emitted interference		EN 61000-6-3:2007/A1:2011
AS-Interface		EN 62026-2:2013
Noise immunity		EN 61000-6-2:2005/AC:2005 EN 62026-2:2013
Functional safety		IEC 61508:2010 (SIL3) EN 62061:2005
Programming instructions		
Profile		Diagnostic node: S-7.A.E, ID1 = 5 Input node: S-7.A.E, ID1 = 7
IO code		7
ID code		F
Ambient conditions		
Ambient temperature		0 ... 55 °C (32 ... 131 °F)
Storage temperature		-25 ... 85 °C (-13 ... 185 °F)
Mechanical specifications		
Degree of protection		IP20
Connection		removable terminals rated connection capacity: rigid/flexible (with and without wire-end ferrules): 0.25 mm^2 ... 2.5 mm^2 for multiple-wire connection with two wires of equal cross-section: flexible with twin wire-end ferrules: 0.5 mm^2 ... 1.5 mm^2
Material		
Housing		PA 66-FR
Mounting		DIN mounting rail

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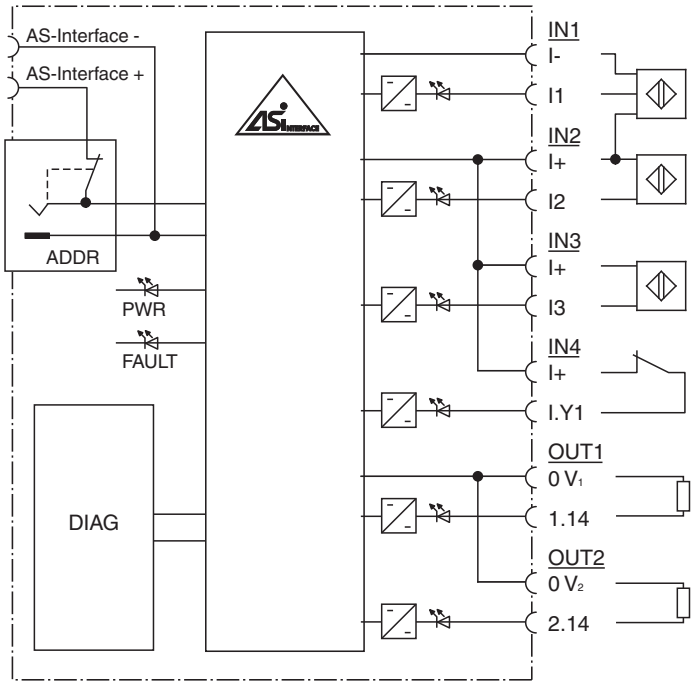
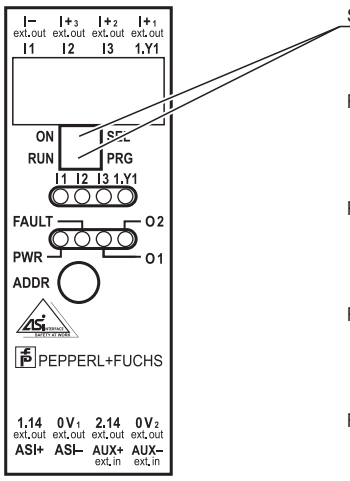
Connection



Assembly



Switches to select the operational mode:

Normal operating mode

Addressing:
Safety slave (single address)

Addressing:
4I input slave (AB address)

Addressing:
Diagnostic slave (AB address)

Connection

Do not connect inputs and outputs, which are supplied via the module from AS-interface or via auxiliary power, with power supply and signal circuits with external potentials.

Accessories

	**VBP-HH1-V3.0-KIT**	AS-Interface Handheld with accessory
	**VAZ-PK-1,5M-V1-G**	Adapter cable module/hand-held programming device

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Programming

Programming Instructions (Bit Assignment of Inputs and Outputs, Standard and EDM Input)			
Bit	**AS-Interface Output**	**Bit**	**AS-Interface Input**
A0	Not used	E0	I1
A1	Not used	E1	I2
A2	Not used	E2	I3
A3	Not available	E3	1.Y1

Programming Instructions (Bit Assignment 1 Diagnostic Node)					
Bit	**AS-Interface Output**		**Bit**	**AS-Interface Input**	
A0	Parameter P1=1	Parameter P1=0	E0	See diagnostics table	
	Not used	1: Switches output O1 on if release is issued. 0: Switches output O1 off although release is issued			
A1	Parameter P1=1	Parameter P1=0	E1		
	Not used	1: Switches output O2 on if release is issued. 0: Switches output O2 off although release is issued			
A2	Not used		E2		
A3	Not available		E3	Parameter P2=0	Parameter P2=1
				1.Y1	1: Feedback for user: Release activated 0: Feedback for user: Release deactivated

Diagnostics				
Value	**Color**	**Description**	**Status Change**	**LED Out**
0	Green	Output on		On
1	Green flashing	-		-
2	Yellow	Restart interlock	Help signal 2	1 Hz
3	Yellow flashing	-		-
4	Red	Output off		Off
5	Red flashing	Waiting to reset fault condition	Help signal 1	8 Hz
6	Gray	Internal fault such as fatal error	By powering device on only	All LEDs flash
7	Green/yellow	Output released but not switched on	Switched on by setting A1	Off

Programming Instructions (Bit Assignment of the AS-Interface Parameter, Diagnostic Node)	
P1 Bit	
P1=1	Safe output switches when released
P1=0	Safe output switches when released and when A0=1 and A1=1
P1 Bit	
P2=1	Feedback for user: AS-Interface E3 bit released
P2=0	Input 1.Y1 on AS-Interface E3 bit
P0, P3 Bits	
Not used	

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Release		AS-Interface Safety Output Module, Release AS-Interface Safety Monitor	
	AS-Interface Parameter	No Release	Release
AS-Interface parameter (diagnostic node) changes the function of A0 and A1 output bits	P1=1 (default) A0=0	Semiconductor output 1 not switched on	Semiconductor output 1 switched on
	P1=1 A0=1	Semiconductor output 1 not switched on	Semiconductor output 1 switched on
	P1=0 A0=0	Semiconductor output 1 not switched on	Semiconductor output 1 not switched on
	P1=0 A0=1	Semiconductor output 1 not switched on	Semiconductor output 1 switched on
	P1=1 (default) A1=0	Semiconductor output 2 not switched on	Semiconductor output 2 switched on
	P1=1 A1=1	Semiconductor output 2 not switched on	Semiconductor output 2 switched on
	P1=0 A1=0	Semiconductor output 2 not switched on	Semiconductor output 2 not switched on
	P1=0 A1=1	Semiconductor output 2 not switched on	Semiconductor output 2 switched on

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