ASi Safety Output Module, IP20, 1SO/3I/1EDM

Safety and standard I/O in one module

with diagnostic node

1 release circuit; 2 x electronic safe outputs

1 EDM input, 2 outputs

Additional 3 standard inputs

IEC 61508 SIL 3, EN ISO 13849-1 PLe cat. 4, EN 62061 SIL 3

Protection category IP20

(Figure similar)

Figure	Type	Housing	Inputs digital, EDM [1]	Outputs Safety, SIL 3, cat 4	Input voltage (sensor supply.) [2]	Output voltage (actuator supply.) [3]	ASi address [4]	Article no.
	IP20, 22,5 mm x 114 mm, 4 x COMBICON, Safety	4 x COMBICON	1 EDM + 3 standard	1 release circuit; 2 x electronic safe outputs, max. 3 A, aug. reliability	out of AUX	out of AUX	1 single address + 2 AB addresses	**BWU3398**
	IP20, 22,5 mm x 114 mm, 4 x COMBICON, Safety	4 x COMBICON	1 EDM + 3 standard	1 release circuit; 2 x electronic safe outputs	out of AUX	out of AUX	1 single address + 2 AB addresses	**BWU2173**

(1) **Inputs digital, EDM**
An externally connected relay (contactor) can be connected via a feedback loop to the Safety Monitor for monitoring purposes.

(2) I**nput voltage (sensor supply):** inputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, inputs shall not be connected to earth or to external potential.

(3) **Output voltage (actuator supply):** outputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, outputs shall not be connected to earth or to external potential

(4) **ASi address:** 1 AB address (max. 62 AB addresses/ASi network), 2 AB addresses (max. 31 modules with 2 AB addresses), Single addresses (max. 31 Single addresses/ASi network), mixed use allowed.
For modules with two ASi nodes the second ASi node is turned off as long as the first ASi node is addressed to address "0".
Upon request, ASi nodes are available with specific ASi address profiles.

ASi Safety Output Module, IP20, 1SO/3I/1EDM

Article no.		BWU3398	BWU2173
Connection			
Connection		4 x COMBICON	
Length of connector cable		unlimited (1)	
ASi			
Profile		Diagnostic node: S-7.A.E, ID1=5 AB node: S-7.A.E., ID1=7	
Address		1 single address + 2 AB addresses	
Required Master profile		≥M3	
As of ASi specification		2.1	
Operating voltage		30 V (18 … 31.6 V)	
Max. current consumption		< 200 mA	
AUX			
Operating voltage		24 V (18 … 30 V)	
Max. current consumption		6 A	1 A
Input			
Number		1 EDM + 3 standard + 1 diagnostic	
Power supply		out of AUX	
Switching current		15 mA (T = 100 µs), continuously 4 mA at 24 V	
Power supply of attached sensors	up to +25 °C	max. 100 mA	
	at +40 °C		
	at +55 °C		
External device monitoring (EDM)		supplied out of AUX, approx. 10 mA	
Output			
Number		1 release circuit; 2 x electronic safe outputs, augmented reliability	1 release circuit; 2 x electronic safe outputs
Max. contact load		3 A_{DC-13} at 24 V	0,5 A_{DC-13} at 24 V
Max output current	up to +25 °C	3 A per output, ∑ (In/Out) 6 A (2)	1 A
	at +40 °C	2,6 A per output, ∑ (In/Out) 5,3 A (2)	
	at +55 °C	2,2 A per output, ∑ (In/Out) 4,5 A (2)	
Test pulse		if output is on: minimum interval between 2 test pulses: 250 ms pulse width: 1 ms	
Display			
LED I1...In (yellow)		state of inputs I1...I3	
LED 1.Y1 (yellow)		state of EDM input 1.Y1	
LED ASI (green)		on: ASi voltage on flashing: ASi voltage on, but peripheral fault (3) or address 0 off: no ASi voltage	
LED FAULT (red)		on: no data exchange (ASi address 0 or ASi node offline) flashing: peripheral fault (3) off: ASi node online	
LED O1, O2 (yellow)		state of outputs O1, O2	

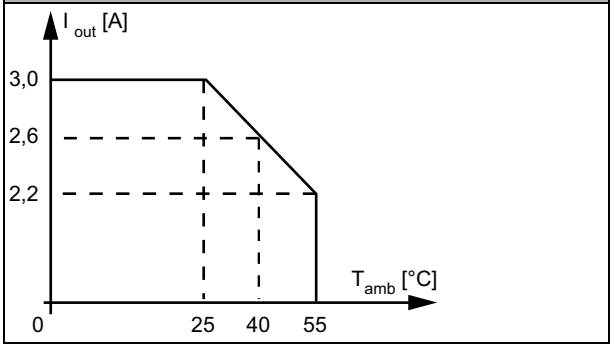
ASi Safety Output Module, IP20, 1SO/3I/1EDM

Article no.	BWU3398	BWU2173
Environment		
Applied standards	IEC 61508 SIL 3 EN ISO 13849-1 PLe cat 4 EN 62061 SIL 3 EN 60529	
Can be used in passively safe paths up to SIL3/PLe	no (4)	
Operating height max.	2000 m	
Ambient temperature	-30 °C ... +55 °C (5), no condensation permitted	
Storage temperature	-25 °C ... +85 °C	
Housing	plastic, for DIN rail mounting	
Pollution Degree	2	
Protection category	IP20	
Tolerable loading referring to humidity	according to EN 61131-2	
Maximum tolerable shock and vibration stress	according to EN 61131-2	
Insulation voltage	≥ 500 V	
Weight	150 g	
Dimensions (W / H / D) in mm	25 / 105 / 114	

(1) loop resistance ≤ 150 Ω

(2)

BWU3398
Derating current per output



(3) **see table "Peripheral fault indication"**

(4) The module is not suitable for use in passively safe paths because an exclusion of errors cannot be assumed for the connection of the two potentials, ASi and AUX.

(5) temperature range up to -30°C from Ident.No. ≥16367

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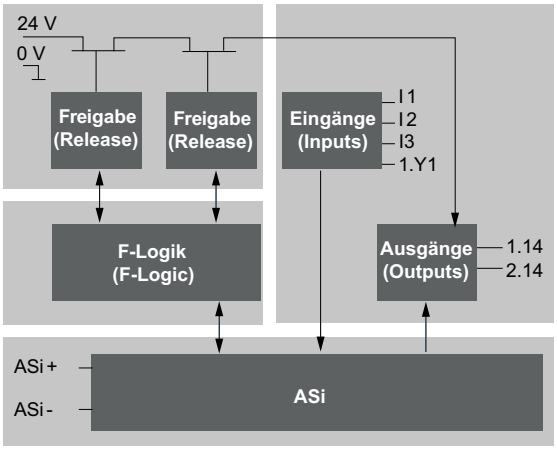
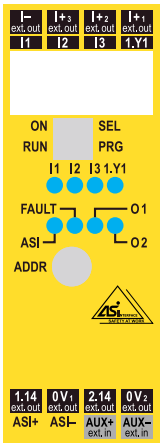
Wiring rules

	Push-in terminals
General	
Nominal cross section	2.5 mm^2
Conductor cross section	
Conductor cross section solid	0.2 ... 2.5 mm^2
Conductor cross section flexible	0.2 ... 2.5 mm^2
Conductor cross section flexible, with ferrule	without plastic sleeve: 0.2 ... 2.5 mm^2
	with plastic sleeve: 0.25 ... 2.5 mm^2
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0.5 ... 1.5 mm^2
AWG	24 ... 14
Stripped insulation length	10 mm

Article no.	Peripheral fault indication		
	Overload sensor supply	Output short circuited	AUX voltage missing
BWU2173	•	–	•
BWU3398	•	–	•

UL-specifications (UL508) **BWU2173, BWU3398**	
External protection	An isolated source with a secondary open circuit voltage of ≤30 V_{DC} with a 3 A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.





Clamps	Description
I1, I2, I3	standard inputs I1, I2 and I3
1.14	semiconductor output 1
2.14	semiconductor output 2
I-, I+	supply voltage for inputs
1.Y1	EDM 1 / input for electronic device monitoring
ASi +, ASi -	ASi network connection
AUX $+_{ext.in}$, AUX $-_{ext.in}$	voltage supply input

Programming instructions (bit values of inputs/outputs, 3I standard inputs and 1 EDM input)			
Bit	**ASi output**	**Bit**	**ASi input**
O0	not used	**I0**	I1
O1	not used	**I1**	I2
O2	not used	**I2**	I3
O3	inexistent	**I3**	1.Y1

Programming instructions (bit values of the diagnostic node)					
Bit	**ASi output**		**Bit**	**ASi input**	
O0	**Parameter P1=1**	**Parameter P1=0**	**I0**	diagnostic (for definition see table device colors)	
	not used	1: output O 1 controlled by safety release 0: inhibits output O 1 on irrespective of safety release			
O1	**Parameter P1=1**	**Parameter P1=0**	**I1**		
	not used	1: output O 2 controlled by safety release 0: inhibits output O 2 on irrespective of safety release			
O2	not used		**I2**		
O3	inexistent		**I3**	**Parameter P2=0**	**Parameter P2=1**
				1.Y1	1: feedback for user: *safety release on* 0: feedback for user: *safety release off*

Peripheral fault indicates unavailable 24 V ext.

Diagnostic (device colors)				
Value	**Color**	**Description**	**State change**	**LED O1, O2**
0	green	output on		on
1	green flashing	–		–
2	yellow	restart inhibit	auxiliary signal 2	1 Hz
3	yellow flashing	–		–
4	red	output off		off
5	red flashing	waiting for "reset of error condition"	auxiliary signal 1	8 Hz
6	gray	internal error, such as "fatal error"	only via "Power On" on device	all LEDs flashing
7	green/yellow	output released, but not switched on	switching-on by setting of O1	off

Programming instructions (bit values of the ASi parameter, diagnostic node)	
Bit P1	
P1=1	safe output controlled by safety release only
P1=0	safe output controlled by output O0=1 and O1=1 in addition to safety release
Bit P2	
P2=1	feedback for user: release on ASi bit I3
P2=0	input 1.Y1 at ASi bit I3
Bits P0, P3:	
not used	

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Release	ASi Parameter	ASi Safety Output Module, safety release from the ASi safety monitor	
		... not received	... received
ASi parameter (AB node) changes the function of output bit O0 and O1	P1=1 (default) O0=0	semiconductor output 1 open	semiconductor output 1 closed
	P1=1 O0=1	semiconductor output 1 open	semiconductor output 1 closed
	P1=0 O0=0	semiconductor output 1 open	semiconductor output 1 open
	P1=0 O0=1	semiconductor output 1 open	semiconductor output 1 closed
	P1=1 (default) O1=0	semiconductor output 2 open	semiconductor output 2 closed
	P1=1 O1=1	semiconductor output 2 open	semiconductor output 2 closed
	P1=0 O1=0	semiconductor output 2 open	semiconductor output 2 open
	P1=0 O1=1	semiconductor output 2 open	semiconductor output 2 closed

LEDs	State	Signal / Description
ASI (green)		no operating voltage
	1 Hz	operating voltage present, safety-related ASi address and/or ASi AB address is „0“ or no 24V ext. in (auxiliary power) or overload sensor supply
		operating voltage present
FAULT (red)		ASi communication OK
		no data exchange with at least one AB node
		no 24V ext. in (auxiliary power) or overload sensor supply
O1, O2 (yellow)		semiconductor output open
	1 Hz	restart inhibit, waiting for the start signal, the semiconductor output switches on after the start signal
	8 Hz	device is in unlockable error state; waiting for "reset of error condition signal"; after receiving this signal the device follows up with normal operation
		semiconductor output closed
I1, I2, I3, 1.Y1 (yellow)		the corresponding input is *not* connected
		the corresponding input is connected
	(running light)	switch is adjust to ON/PRG position
LED on	LED flashing	LED off	

⚠	In case all LEDs are blinking simultaneously in fast rhythm a fatal error has been detected. This message is reset by a short-run disconnection of the power supply (Power On Reset).

Accessories:

- **Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)**
- **ASi-5/ASi-3 Address Programming Device (art. no. BW4708)**