

ASi Safety Output Module

Safe outputs and standard inputs in one module

Protection category IP20



Figure	Inputs digital	Outputs Safety, SIL3, cat.4	Input voltage (sensor supply) ⁽¹⁾	Output voltage (actuator supply) ⁽²⁾	ASi connection ⁽³⁾	ASi address ⁽⁴⁾	Article no.
	8	1-8 release circuits, 8 x electronic safe out-puts	out of AUX	out of AUX	clamps	depending on configuration	BWU2836

(1) Input 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.

(2) 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.

(3) ASi connection:

the connection to ASi as well to AUX (auxiliary 24 V power) is made via yellow resp. black ASi profile cable with piercing technology or via M12 socket (in IP20 via clamps).

(4) ASi Address:

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.

Article no.	BWU2836
Connection	
Connection	Push-in terminals
Length of connector cable	unlimited ⁽¹⁾
ASi	
Profile	ASi configuration node: S-7.A.5 4I/4O ASi nodes: S-7.A.7 ASi diagnostics nodes: S-7.A.E
Addresses	depending on configuration
Required Master profile	≥M4
Since ASi specification	3.0
Operating voltage	18 ... 31,6 V
Max. current consumption	200 mA
AUX	
Voltage	20 ... 30 V (PELV)
Max. current consumption	8 A
Inputs	
Number	8 digital inputs
Power supply	out of AUX
Input level	U<5 V (low) U>15 V (high)
Outputs	
Number release circuits	1-8 release circuits, configurable
Number	8 x electronic safe outputs
Power supply	out of AUX
Max. output current	2 A per output, Σ = max. 8 A (see table „Derating for output current“)
Test pulse	if output is switched on: minimum distance between two test pulses: 250 ms, pulse length 1 ms
Display	
LED ASI (green)	ASi power
LED FAULT/FLT (red)	ASi error
LEDs I1 ... I4 (yellow)	state of inputs I1 ... I4
LEDs SO1 ... SO8 (yellow)	state of safe outputs SO1 ... SO8
LED ALARM (yellow)	PLC reports alarm
LED AUX (red)	on: 24 V _{DC} AUX on off: no 24 V _{DC} AUX
Environment	
Applied standards	EN 62026-2:2013 EN 61508:2010 EN 62061:2005/A1:2013 EN ISO 13 849-1:2008/AC:2009 EN 60529
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽²⁾
Operating altitude	max. 2000 m
Ambient temperature	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C
Housing	plastic, din-rail mounting
Tolerable loading referring to humidity	according to EN 61131-2
Protection category	IP20
Voltage of insulation	≥500 V
Weight	270 g
Dimensions (W / H / D) in mm	22,5 / 99 / 114

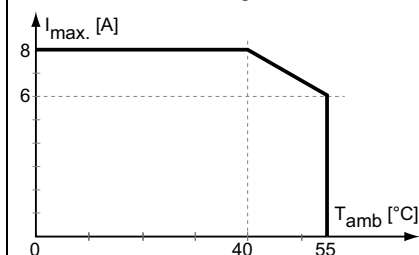
⁽¹⁾ loop resistance ≤ 150 Ω

- (2) The module is not suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors cannot be assumed for the connection of the two ASi and AUX potentials.

If the module is supplied from an unswitched AUX cable, this has no influence on the safety consideration for the paths with passively safe-switched AUX cable. In an ASi circuit, paths supplied from a passively safe-switched AUX cable and paths supplied from unswitched AUX potential can be used together.

Derating for output current

Installation with mounting distance 3 cm left/right



Installation without mounting distance



UL-specifications (UL508)

BWU2836

External protection	An isolated source with a secondary open circuit voltage of $\leq 30 V_{DC}$ 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.

ASi diagnostic node 1-8 (depending on number of release circuits)

Bit setting of in- and outputs

Bit	ASi output	Bit	ASi input
00	Parameter P1=1 not used	10	Diagnostic (see table „Diagnostic (device colors)“)
	Parameter P1=0 1: output controlled by safety release 0: inhibits output on irrespective of safety release	11	
01	not used	12	
02	not used		
03	inexistent	13	Parameter P2=0 1: feedback for user: <i>safety release on</i> 0: feedback for user: <i>safety release off</i>
			Parameter P2=1 In ⁽¹⁾

Peripheral fault indicates unavailable AUX or overload on the outputs

- (1) state of the assigned input.

Release conditions

ASi diagnostic nodes				Standard I/O ASi nodes		
				ASi node 1		
				Parameter P0 = 0	Parameter P0 = 1	
					Bit D _{n-1} = 0	Bit D _{n-1} = 1
ASi node 1 ... 4				Parameter P1 = 1	SO _n = release	SO _n = off
				Parameter P1 = 0	SO _n = release	SO _n = release
				Bit O0 = 0	SO _n = off	SO _n = off
				Bit O0 = 1	SO _n = release	SO _n = release

ASi diagnostic nodes				Standard I/O ASi nodes		
				ASi node 2		
				Parameter P0 = 0	Parameter P0 = 1	
					Bit D _{n-1} = 0	Bit D _{n-1} = 1
ASi node 5 ... 8				Parameter P1 = 1	SO _n = release	SO _n = off
				Parameter P1 = 0	SO _n = release	SO _n = release
				Bit O0 = 0	SO _n = off	SO _n = off
				Bit O0 = 1	SO _n = off	SO _n = off

Diagnostic (device colors)

Value	Color	Description	State change	LED SOn
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" or AUX voltage missing	auxiliary signal 1 or connect AUX	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 O0	off

Programming instructions ASi diagnostic node (bit setting)

Bit P1	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by safety release and O0=1
Bit P2	
P2=1	input In ⁽¹⁾ at ASi bit I3
P2=0	feedback for user: release <i>on</i>
Bits P0, P3:	
not used	

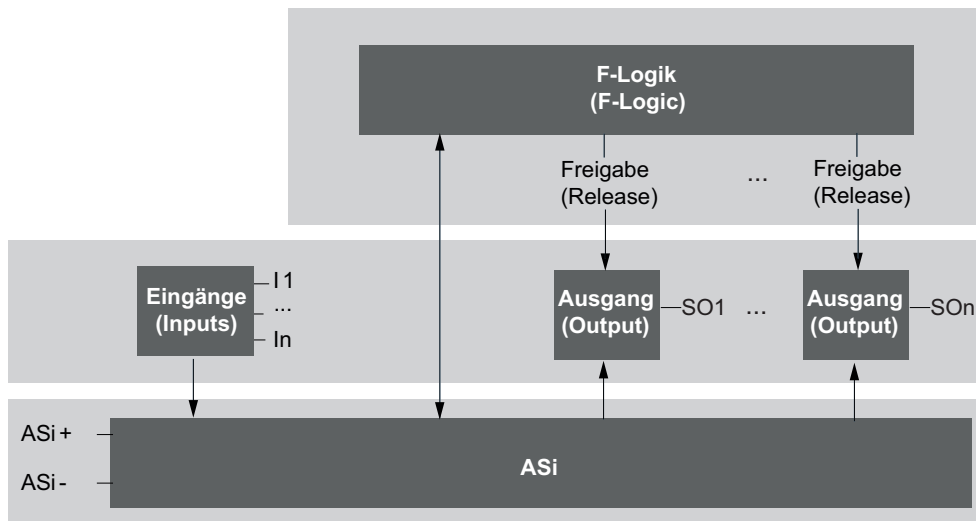
⁽¹⁾ state of the assigned input.

4I/4O ASi node

Programming 4I/4O ASi nodes (bit setting)

Bit	ASi output		Bit	ASi output	
	ASi node 1	ASi node 2		ASi node 1	ASi node 2
O0	SO1	SO5	I0	I1	I5
O1	SO2	SO6	I1	I2	I6
O2	SO3	SO7	I2	I3	I7
O3	SO4	SO8	I3	I4	I8

Block diagram



As long as the F-logic has - by means of the safe ASi output nodes- released, the physical outputs can be switched via the data bits of the 4I/4O ASi nodes via standard control. If the release is omitted, the physical outputs will be switched off safely.

All 8 physical outputs can be released jointly by a safe ASi output node. However, it is also possible to install one safe ASi output node for each single physical output. Each intermediate setting is possible, e.g. one safe ASi output node for 2 physical outputs.

Accessories:

- **ASi-5/ASi-3 Address Programming Device (art. no. BW4925)**
- **Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)**