

ASi Safety I/O Module

Up to 8 x 2 channels safe inputs for:

- for floating contacts
- for OSSDs
- for complementary switches
- complementary OSSDs
- adjustable test pulse width

resp. as standard inputs

1 release circuit (1 x electronic safe output)

- augmented reliability

Optimal costs for safe in- and outputs on ASi

Maximum number of safe inputs at 22.5 mm cabinet width

Optimized for service and commissioning

with coded terminals

Protection category IP20

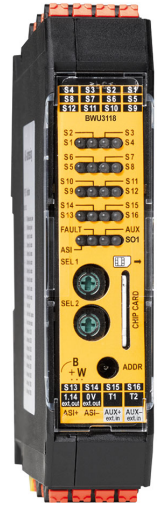


Figure	Type	Inputs Safety, SIL 3, cat. 4	Outputs Safety, SIL 3, cat. 4	Safety signal inputs	Input voltage (sensor supply.) ⁽¹⁾	Output voltage (actuator supply.) ⁽²⁾	ASi address ⁽³⁾	Article no.
	IP20, 22,5 mm x 114 mm, 6 x 4 contacts, Safety	8 x 2 channels	1 release circuit; 1 x electronic safe outputs augmented reliability	floating contacts, complementary switches, OSSDs, complementary OSSDs	out of AUX	out of AUX	depending on configuration	BWU3118

(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 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.

Article no.	BWU3118
Connection	
ASi / AUX connection	push-in terminals with coded terminals
Periphery connection	push-in terminals with coded terminals
Length of connector cable	unlimited ⁽¹⁾
ASi	
Profile	safety ASi input nodes: S-0.B.0 (ID1=F, default) ASi diagnostic nodes: S-7.A.E (ID1=5, default) 4I/4O node: S-7.F.E (ID1=F, default) ⁽²⁾ ASi configuration node: S-7.A.5 (ID1=7, default)
Address	depending on configuration
Required Master profile	≥M3
Since ASi specification	2.1
Voltage	30 V _{DC} (18 ... 31,6 V)
Max. current consumption	200 mA
Max. continuous operating current	125 mA
AUX	
Voltage	24 V _{DC} (20 ... 30 V)
Max. current consumption	1 A
Input	
Number	up to 8 x 2 channels safe inputs ⁽³⁾ up to 16 standard inputs ^{(2) (3)}
Supply voltage inputs	out of AUX
Sensor supply	short-circuit and overload protected per EN 61131
Max. current for sensor supply	0,7 A
Safety Signal	floating contacts or complementary switches, OSSDs resp. complementary OSSDs ^{(3) (4)}
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Switching threshold	<5 V (low) >15 V (high)
OSSD test pulses	0 ... 50 Hz
OSSD test pulse width	0 ... 51 ms, adjustable
Input level	10 mA, R < 150 Ω
Clock outputs for floating contacts / antivalent switches	1 test pulse per clock output per second, pulse duration approx. 1 ms
Output	
Number	1 release circuit (1 x fast electronic safe output) ⁽³⁾
Max. contact load:	0,7 A DC-13 at 24 V
Supply voltage outputs	out of AUX
Output	short-circuit and overload protected per EN 61131
Test pulse	when output is switched on minimal distance between 2 test pulses: 250 ms, pulse length up to 1 ms
Display	
LED ASI (green)	ASi power supply on
LED FAULT (red)	on: no data exchange or adress 0 flashing: peripheral error
LED AUX (green)	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX
LEDs S1 ... Sn (yellow)	state of input S1 ... S16
LED SO1 (yellow)	output 1 has switched

Article no.	BWU3118
Environment	
Applied standards	EN 60529 IEC 61508 SIL 3 EN 62061 SIL 3 EN ISO 13849-1 PLe cat. 4
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	yes ⁽⁵⁾
Operating altitude max.	5000 m
Storage temperature	0 °C ... +55 °C
Operating temperature	-25 °C ... +85 °C
Housing	plastic, for DIN-rail mounting
Verschmutzungsgrad	2
Protection class (EN 60529)	IP20
Tolerable loading referring to humidity	according to EN 61131-2
Isolation voltage	≥ 500 V
Weight	160 g
Dimensions (W / H / D in mm)	22,5 / 99 / 114,5

(1) loop resistance ≤ 150 Ω

(2) emulated standard address from Ident. ≥ID21085.

(3) see "Configuration options of connections"

(4) complementary OSSDs from Ident. ≥ID21085.

(5) from Ident. ≥ID14949. The module is suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors can be assumed for the connection of the two ASi and AUX potentials.

Wiring rules

Push-in terminals, 2 /3 /4 poles (pitch 5 mm)	
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: 0.25 ... 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

UL-specifications (UL508)	
BWU3118	
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.

Terminal assignment BWU3118

BWU3118	Signal name	Description
	S1, S2	connection 2 channel safe input 1 (SI1) configurable for floating contacts (float.cont.), antivalent switches (antiv.sw.), OSSDs, antivalent OSSDs or as standard input (standard.in)
	S3, S4	connection 2 channel safe input 2 (SI2)
	S5, S6	connection 2 channel safe input 3 (SI3)
	S7, S8	connection 2 channel safe input 4 (SI4)
	S9, S10	connection 2 channel safe input 5 (SI5)
	S11, S12	connection 2 channel safe input 6 (SI6)
	S13, S14	connection 2 channel safe input 7 (SI7)
	S15, S16	connection 2 channel safe input 8 (SI8)
Ix	standard input x	
Ox	standard output x	
SOx	safe electronic output x	
T1	clock output 1 (S1, S3, S5, S7, S9, S11, S13, S15)	
T2	clock output 2 (S2, S4, S6, S8, S10, S12, S14, S16)	
24 V _{ext.out}	power supply, out of external 24 V, positive pole (AUX)	
0 V _{ext.out}	power supply, out of external 24 V, negative pole (AUX)	
24 V _{out of ASi}	power supply, out of ASi, positive pole	
0 V _{out of ASi}	power supply, out of ASi, negative pole	
1.14 _{ext.out}	semiconductor output 1	
0 V _{ext.out}	mass connection for semiconductor output 1	
ADDR	addressing socket	
ASI+, ASI-	connection to ASi Bus	
AUX + _{ext.in} , AUX - _{ext.in}	connection for power supply, out of external 24 V (AUX)	
NC	normally closed contact	
NO	normally open contact	
CHIP CARD	chip card slot	
n.c.	not connected	
d.n.c.	do not connect	

Configuration options of connections

BWU3118				
Function/ configuration	terminal assignment			
S11, S12	S4	S3	S2	S1
float. cont.	NC (T2)	NC (T1)	NC (T2)	NC (T1)
antiv.sw.	NO (T2)	NC (T1)	NO (T2)	NC (T1)
OSSD	NC (OSSD4)	NC (OSSD3)	NC (OSSD2)	NC (OSSD1)
antiv.OSSD ⁽¹⁾	NO (OSSD4)	NC (OSSD3)	NO (OSSD2)	NC (OSSD1)
standard.in ⁽²⁾	I4	I3	I2	I1
S13, S14	S8	S7	S6	S5
float. cont.	NC (T2)	NC (T1)	NC (T2)	NC (T1)
antiv.sw.	NO (T2)	NC (T1)	NO (T2)	NC (T1)
OSSD	NC (OSSD8)	NC (OSSD7)	NC (OSSD6)	NC (OSSD5)
antiv.OSSD ⁽¹⁾	NO (OSSD8)	NC (OSSD7)	NO (OSSD6)	NC (OSSD5)
standard.in ⁽²⁾	I8	I7	I6	I5

BWU3118				
Function/ configuration	terminal assignment			
SI5, SI6	S12	S11	S10	S9
float. cont.	NC (T2)	NC (T1)	NC (T2)	NC (T1)
antiv.sw.	NO (T2)	NC (T1)	NO (T2)	NC (T1)
OSSD	NC (OSSD12)	NC (OSSD11)	NC (OSSD10)	NC (OSSD9)
antiv.OSSD ⁽¹⁾	NO (OSSD12)	NC (OSSD11)	NO (OSSD10)	NC (OSSD9)
standard.in ⁽²⁾	I12	I11	I10	I9
SI7, SI8	S13	S14	S15	S16
float. cont.	NC (T1)	NC (T2)	NC (T1)	NC (T2)
antiv.sw.	NO (T1)	NC (T2)	NO (T1)	NC (T2)
OSSD	NC (OSSD13)	NC (OSSD14)	NC (OSSD15)	NC (OSSD16)
antiv.OSSD ⁽¹⁾	NC (OSSD13)	NO (OSSD14)	NC (OSSD15)	NO (OSSD16)
standard.in ⁽²⁾	I13	I14	I15	I16
SO1, clock output	1.14_{ext.out}	0 V_{1.ext.out}	T1	T2
safe output	SO1	0 V _{ext.out}	T1	T2
ASi, AUX	ASi +	ASi -	AUX +_{ext.in}	AUX -_{ext.in}

(1) complementary OSSDs from Ident. ≥ID21085.

(2) emulated standard address from Ident. ≥ID21085.

Addressing			Addressing		
SEL1	SEL2	Description	SEL1	SEL2	Description
0	0	RUN, without ASi configuration node			
E	E	RUN, with ASi configuration node			
1	1	addressing safety input 1, contacts	5	1	addressing safety input 1, OSSD
2	2	addressing safety input 2, contacts	6	2	addressing safety input 2, OSSD
3	3	addressing safety input 3, contacts	7	3	addressing safety input 3, OSSD
4	4	addressing safety input 4, contacts	8	4	addressing safety input 4, OSSD
5	5	addressing safety input 5, contacts	9	5	addressing safety input 5, OSSD
6	6	addressing safety input 6, contacts	A	6	addressing safety input 6, OSSD
7	7	addressing safety input 7, contacts	B	7	addressing safety input 7, OSSD
8	8	addressing safety input 8, contacts	C	8	addressing safety input 8, OSSD
9	9	addressing safety output 1			
A	A	addressing safety output 1, diagnostic			
D	D	reset to factory defaults			

Programming instructions (bit assignment of standard I/O node)

Article no.	ASi bit assignment			
BWU3428	D3	D2	D1	D0
	input			
node 1	I4	I3	I2	I1
node 2	I8	I7	I6	I5
node 3	I12	I11	I10	I9
node 4	I16	I15	I14	I13

Diagnostics (device colors)

Value	Color	Description	State change	LED SO1
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 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

ASi diagnostic nodes

Bit	input	output
Bit0	Diagnostic color	If P1=0 and A0=0, the output is switched off independent from release
Bit1		free
Bit2		free
Bit3	P2=1: response S3 P2=0: response of the release of the state	non existent

Assignment code half sequence - terminals

Code half sequence	Terminals
Bit0	Input terminals: SI 2 / SI 4 / SI 6 / SI 8 / SI 10 / SI 12 / SI 14 / SI 16
Bit1	
Bit2	Input terminals: SI 1 / SI 3 / SI 5 / SI 7 / SI 9 / SI 11 / SI 13 / SI 15
Bit3	

Bit	ASi Parameter
Bit P1	
P1=0	Safety output SO _n controlled by safety release and O0=1
P1=1	Safety output SO _n controlled by safety release only

Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)