

ASi Safety I/O Module

Up to 8 x 2 channels safe inputs for:

- floating contacts
- complementary switches
- OSSDs
- complementary OSSDs
- adjustable test puls width

resp. as standard inputs

1 release circuit (1 x electronic safe output)

- augmented reliability

Optimal costs for safety in- and outputs on ASi

Module width of 22.5 mm,
for optimal use of space in the service cabinet

Universal module for as many use cases,
optimized for service and commissioning

Protection category IP20



(figure similar)



Figure	Type	Inputs Safety, SIL 3, cat. 4	Outputs Safety, SIL 3, cat. 4	Safety signal in- puts	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 configura- tion, opti- mized for ASIMON360	BWU3428

⁽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.

Article no.	BWU3428
Connection	
ASi / AUX connection	push-in terminals
Periphery connection	push-in 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
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
Visualization	
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.	BWU3428
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⁾
Ambient temperature	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C
Housing	plastic, for DIN-rail mounting
Protection class	IP20
Tolerable loading referring to humidity	according to EN 6131-2
Voltage of insulation	≥ 500 V
Weight	160 g
Dimensions (W / H / D in mm)	22,5 / 99 / 114,5

(1) loop resistance ≤ 150 Ω

(2) BWU3428: emulated standard address from Ident. ≥ID20940.

(3) see "Configuration options of connections"

(4) BWU3428: complementary OSSDs from Ident. ≥ID20940.

(5) 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.

UL-specifications (UL508) BWU3428	
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.

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

Terminal assignment BWU3428

BWU3428	Signal name	Description
	S1, S2	connection 2 channel safe input 1 (SI1)
	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

BWU3428				
Function/ configuration	terminal assignment			
S1, S2	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
S3, S4	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

BWU3428				
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 _{1ext.out}	T1	T2
safe output	SO1	0 V _{ext.out}	T1	T2
ASi, AUX	ASi +	ASi -	AUX +_{ext.in}	AUX -_{ext.in}

(1) BWU3428: complementary OSSDs from Ident. ≥ID20940.

(2) BWU3428: emulated standard address from Ident. ≥ID20940.

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

Article no.	ASi bit assignment			
BWU3428	D3	D2	D1	D0
	Eingang			
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

Assignment code half sequence - terminals

	Code half sequence	Terminals
BWU3428	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	

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 switch S31/S32 or S41/S42 P2=0: response of the release of the state	non existent

Accessories:

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