

ASi-5 Safety I/O Module

14 x 1 channel safe inputs or 7 x 2 channel safe inputs for

- for floating contacts
- for antivalent switches
- for OSSDs
- for antivalent OSSDs
- test pulse width adjustable
- Optional use of inputs SI13+SI14 as EDM inputs (feedback circuit for contactor monitoring)

or up to 14 x digital inputs, depending on configuration

2 release circuits (2 x electronic safe outputs)

- augmented reliability

Optimal costs for safety inputs and outputs on ASi

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

only one ASi-5 address required

Protection category IP20



(figure similar)



Figure	Type	Inputs Safety, SIL 3, cat. 4	Inputs digital, EDM ⁽¹⁾	Outputs Safety, SIL 3, cat. 4	Safety signal inputs	Input voltage (sensor supply.) ⁽²⁾	Output voltage (actuator supply.) ⁽³⁾	ASi address ⁽⁴⁾	Article no.
	IP20, 22,5 mm x 114 mm, 6 x 4 contacts, ASi-5 Safety	14 x 1 channel or 7 x 2 channels	2 EDM, up to 14 digital inputs, depending on configuration	2 release circuits; 2 x electronic safe outputs	floating contacts, OSSDs, antivalent switches, antivalent OSSDs	out of AUX	out of AUX	1 ASi-5 address	BWU4277

(1) **Inputs digital, EDM**

An externally connected relay (contactor) can be monitored by connecting the feedback loop to the EDM input.

(2) **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.

(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.

Article no.	BWU4277
Connection	
ASi / AUX connection	push-in terminals
periphery connection	push-in terminals
Length of connector cable	unlimited ⁽¹⁾
ASi	
Address	1 ASi-5 address
Required ASi specification of the Master	ASi-5
Operating voltage	30 V _{DC} (18 ... 31,6 V)
Max. current consumption	100 mA
Max. continuous operating current	100 mA
AUX	
Voltage	24 V _{DC} (20 ... 30 V)
Max. current consumption	2 A
Input	
Number	up to 14 x 1 channel safe inputs or up to 7 x 2 channel safe inputs ⁽²⁾ ; inputs SI13+SI14 optionally as EDM inputs (feedback circuit for contactor monitoring) ⁽²⁾ up to 14 standard inputs ⁽²⁾
Power supply	out of AUX
Safety signal	floating contacts, OSSD, antivalent switches, antivalent OSSDs
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, also configurable as standard output ⁽³⁾ , Σ50 mA
Output	
Number	2 release circuits (2 x electronic safe outputs) ⁽²⁾
Max. contact load	0,7 A DC-13 at 24 V
Power supply	out of AUX
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 voltage on flashing: ASi voltage on, but peripheral fault ⁽⁴⁾ or address 0 off: no ASi voltage
LED FAULT (red)	on: node address 0 or ASi node offline flashing: peripheral fault ⁽⁴⁾ off: ASi node online
LED AUX (green)	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX
LEDs SI1 ... SI14 (yellow)	state of safe inputs SI1 ... SI14
LED SO1, SO2 (yellow)	state of safe outputs SO1, SO2

Article no.	BWU4277
Environment	
Applied standards	EN 60529 IEC 61508 SIL 3 EN 62061 SIL 3 EN ISO 13849-1 PLe Cat. 4
Operating altitude	max. 2000 m
Ambient temperature	0 °C ... +55 °C 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 EN 61131-2
Insulation voltage	≥ 500 V
Weight	160 g
Dimensions (W / H / D) in mm	22,5 / 99 / 114,5

(1) loop resistance ≤ 150 Ω

(2) see "Connection configuration options for BWU4277"

(3) If clock outputs are configured as standard outputs, the safe inputs can only be used as OSSD inputs.

(4) see table "Peripheral fault indication"

Article no.	Peripheral fault indication		
	Overload sensor supply	Overload output	AUX voltage missing
BWU4277	•	•	•

Connection configuration options for BWU4277

Connection	Safe electronic output	1 x 2 channel safe input	2 x 1 channel safe input	EDM input	Standard input	Standard output
SI1	–	•	•	–	•	–
SI2	–		•	–	•	–
SI3	–	•	•	–	•	–
SI4	–		•	–	•	–
SI5	–	•	•	–	•	–
SI6	–		•	–	•	–
SI7	–	•	•	–	•	–
SI8	–		•	–	•	–
SI9	–	•	•	–	•	–
SI10	–		•	–	•	–
SI11	–	•	•	–	•	–
SI12	–		•	–	•	–
SI13	–	•	•	•	•	–
SI14	–		•	•	•	–
SO1	•	–	–	–	–	–
SO2	•	–	–	–	–	–

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

Programming (ASi bit assignment)

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
BWU4277	Safe inputs								
	0	SI8	SI7	SI6	SI5	SI4	SI3	SI2	SI1
	1	reserved		SI14 / EDM2	SI13 / EDM1	SI12	SI11	SI10	SI9
	2	reserved							
	Standard input								
	3	I8	I7	I6	I5	I4	I3	I2	I1
	4	reserved		I14 / EDM2	I13 / EDM1	I12	I11	I10	I9
	Diagnostic data								
	5	release SO2	diagnostics SO2			release SO1	diagnostics SO1		
	6	diagnostics SI3 ⁽¹⁾				diagnostics SI1 ⁽¹⁾			
		diagnostics SI3/SI4 ⁽²⁾				diagnostics SI1/SI2 ⁽²⁾			
	7	diagnostics SI7 ⁽¹⁾				diagnostics SI5 ⁽¹⁾			
		diagnostics SI7/SI8 ⁽²⁾				diagnostics SI5/SI6 ⁽²⁾			
	8	diagnostics SI11 ⁽¹⁾				diagnostics SI9 ⁽¹⁾			
		diagnostics SI11/SI12 ⁽²⁾				diagnostics SI9/SI10 ⁽²⁾			
	9	reserved				diagnostics SI13 ⁽¹⁾			
						diagnostics SI13/SI14 ⁽²⁾			
	10	diagnostics SI4 ⁽¹⁾				diagnostics SI2 ⁽¹⁾			
	11	diagnostics SI8 ⁽¹⁾				diagnostics SI6 ⁽¹⁾			
12	diagnostics SI12 ⁽¹⁾				diagnostics SI10 ⁽¹⁾				
13	reserved				diagnostics SI14 ⁽¹⁾				

⁽¹⁾ in 1 channel configuration

⁽²⁾ in 2 channels configuration

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
BWU4277	Safe outputs								
	0	reserved ⁽¹⁾							
	Standard outputs								
	1	reserved						Release SO2 ⁽²⁾	Release SO1 ⁽²⁾
	2	reserved						(T2)	(T1)

⁽¹⁾ Safe outputs are set by the safety monitor

⁽²⁾ Non-safety-related release

BWU4277	Terminals	Description
	SI1, SI2, SI3, SI4	safe inputs 1-4
	SI5, SI6, SI7, SI8	safe inputs 5-8
	SI9, SI10, SI11, SI12	safe inputs 9-12
	SI13, SI14	safe inputs 13, 14 / EDM inputs 1, 2
	1. 14 _{ext.out}	semiconductor output 1
	0 V _{1 ext.out}	mass connection for semiconductor output 1
	2. 14 _{ext.out}	semiconductor output 2
	0 V _{2 ext.out}	mass connection for semiconductor output 2
	T1	clock 1 (SI1, SI3, SI5, SI7, SI9, SI11, SI13)
	T2	clock 2 (SI2, SI4, SI6, SI8, SI10, SI12, SI14)
	ASI+, ASI-	connection to the ASI bus
	ADDR	connection for ASI-5 addressing plug
	AUX+ _{ext.in} , AUX- _{ext.in}	power supply input

Diagnostics (device colors)

Value	Color	Description	State change	LED SOn
0	green	output on		on
1	green flashing	does not occur with the module	—	—
2	yellow	restart inhibit	auxiliary signal 2	1 Hz
3	yellow flashing	does not occur with the module	—	—
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	Not projected	—	LED ASi flashes, LED FAULT on (red)
		Fatal Error	only via "Power ON" on device	all LEDs flashing
7	green/yellow		—	—

Accessories:

- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)
- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)