

ASi Safety Output Module with ASi Diagnostic node

Safety outputs, safety inputs and standard inputs in one module

4 x electronic safe outputs

2 x 2-channels safe inputs, adjustable as floating contacts, OSSDs or antivalent OSSDs or standard inputs

2 (up to 6) standard inputs



(figure similar)

Article no. BWU3064: ASi Safety Output Module with ASi Diagnostic node

The addresses are set by a configuration node via the ASIMON. All ASi Safety Output Modules with the same safety address switch simultaneously.

Additional AB addresses are available for diagnostics including 4 inputs for EDM and 4 standard outputs to control the safety outputs.

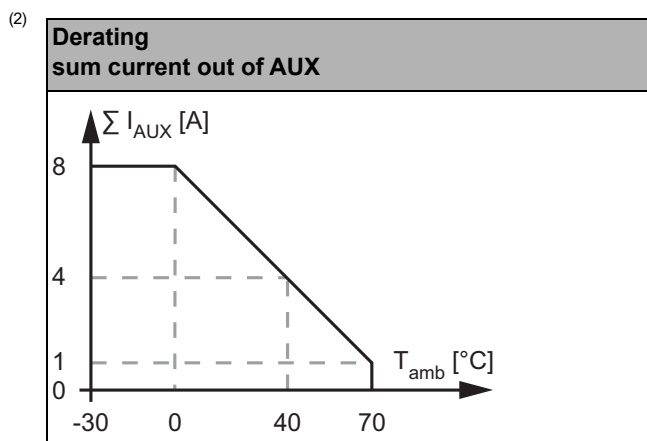
Article no.	BWU3064	
Connection		
ASi/AUX connection	profile cable and piercing technology	
Periphery connection	M12	
Length of connector cable	unlimited ⁽¹⁾	
ASi		
Profile	safe ASi input nodes: S-0.B.0 (ID1=F) and S-0.B.1 (ID1=F) ASi diagnostic nodes: S-7.A.E (ID1=5) 4I/4O ASi nodes: S-7.E (ID1=F) ASi configuration node: S-7.A.5 (ID1=7)	
Addresses	depending on configuration	
Required Master profile	≥M3	
Since ASi specification	3.0	
Operating voltage	30 V _{DC} (18 ... 31,6 V)	
Max. current consumption	<200 mA	
AUX		
Voltage	24 V (18 ... 30 V)	
Max. current consumption	8 A ⁽²⁾	
Input		
Number	2 standard inputs (up to 6, depending on configuration) 2 x 2-channels safe inputs (SIL3, cat. 4, PLe)	
Safety Signal inputs	floating contacts, OSSDs or antivalent OSSDs ⁽³⁾	
Switching current	15 mA (T = 100 μs), continuously 4 mA at 24 V	
OSSD test pulses	0 ... 50 Hz	
OSSD test pulse width	0 ... 51 ms, adjustable	
Clock outputs for floating contacts	1 test pulse per clock output per second, pulse duration approx. 1 ms	
Power supply	out of AUX	
Power supply of attached sensors	up to 0 °C	250 mA, Σ(In/Out) 8 A ^{(2) (4)}
	at 40 °C	150 mA, Σ(In/Out) 4 A ^{(2) (3)}
	at 70 °C	75 mA, Σ(In/Out) 1 A ^{(2) (3)}
Max. current for OSSD	up to 0 °C	1 A, Σ(In/Out) 8 A ^{(2) (4)}
	at 40 °C	1 A, Σ(In/Out) 4 A ^{(2) (4)}
	at 70 °C	1 A, Σ(In/Out) 1 A ^{(2) (4)}
Switching threshold	<5 V (low) >15 V (high)	

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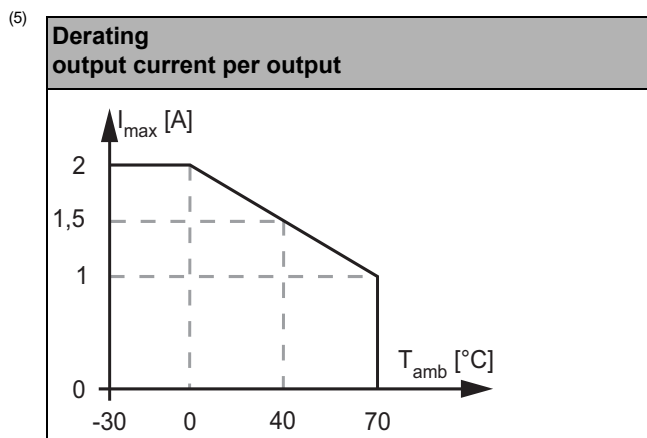
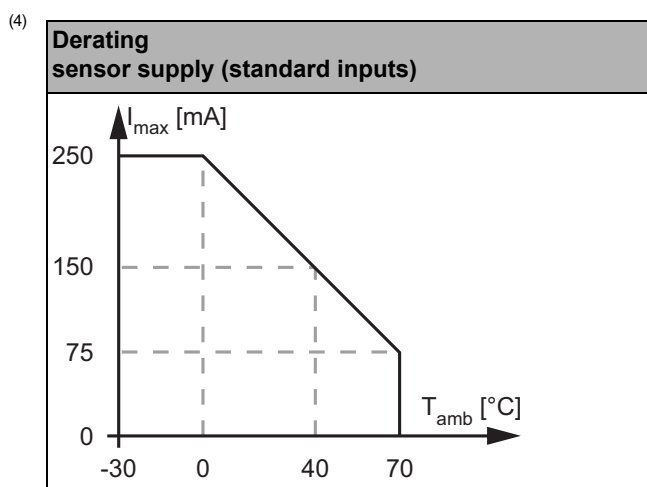
Article no.	BWU3064	
Output		
Number	4 release circuits; 4 x electronic safe outputs	
Max. contact load	2 A at 24 V (1,0 A _{DC-13} at 24 V) ⁽²⁾ ⁽⁵⁾	
Power supply	out of AUX	
Max. output current	up to 0 °C	2 A per output, $\Sigma(\text{In/Out})$ 8 A ⁽²⁾ ⁽⁴⁾
	at 40 °C	1,5 A per output, $\Sigma(\text{In/Out})$ 4 A ⁽²⁾ ⁽⁴⁾
	at 70 °C	1 A per output, $\Sigma(\text{In/Out})$ 1 A ⁽²⁾ ⁽⁴⁾
Test pulse	if output is on: minimum interval between 2 test pulses: 250 ms pulse width: 2 ms	
Display		
LED ASI (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault or ASi address 0 off: no ASi voltage	
LED FLT/FAULT (red)	on: ASi address 0 or ASi node offline flashing: peripheral fault off: ASi node online	
LED AUX (green)	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX	
LED MP (green / yellow / red)	off: no chip card plugged in or chip card defect green: chip card plugged in and recognized yellow flashing: copying configuration from chip card to unconfigured module or from module to empty chip card red: configuration on chip card and module different or configuration on chip card incompatible with the device	
LEDs I1 ...Ix (yellow)	state of standard inputs I1, I2	
LEDs S1 ... Sx (yellow)	state of safety inputs S1 ... S4	
LEDs SO1 ... SOx (yellow)	state of safety outputs SO1 ... SO4	
Environment		
Applied standards	EN 61000-2 EN 61000-3 EN 61131-2 EN 62061 EN ISO 13849-1 EN 60529	
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	yes ⁽⁶⁾	
Operating altitude	max. 2000 m	
Ambient Operating temperature	-30 °C ... +40 °C (-30 °C ... +70 °C ⁽²⁾ ⁽³⁾ ⁽⁴⁾)	
Storage temperature	-30 °C ... +85 °C	
Housing	plastic, for screw mounting	
Pollution Degree	2	
Protection category	IP67 ⁽⁷⁾	
Tolerable loading referring to humidity	according to EN 61131-2	
Max. tolerable shock load	30g, 11 ms, acc. EN 61131-2	
Max. tolerable vibration stress	5 ... 8 Hz 50 mm _{pp} /8 ... 500 Hz 6g, acc. EN 61131-2	
Voltage of insulation	≥500 V	
Weight	225 g	
Dimension (W / H / D in mm)	60 / 151 / 46	

⁽¹⁾ loop resistance ≤150 Ω

ASi Safety Output Module with ASi Diagnostic node



(3) Antivalent OSSDs from Ident. No. ≥21432



(6) 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.

(7) IP67 can only be achieved if all open M12 sockets are sealed with suitable protection caps (see accessories).

UL-specifications (UL508)	
BWU3064	
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.

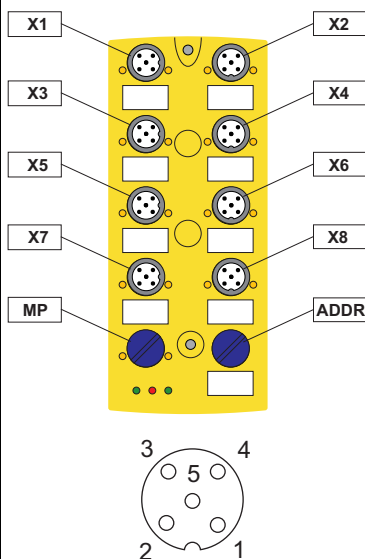
ASi Safety Output Module with ASi Diagnostic node

Pin assignment

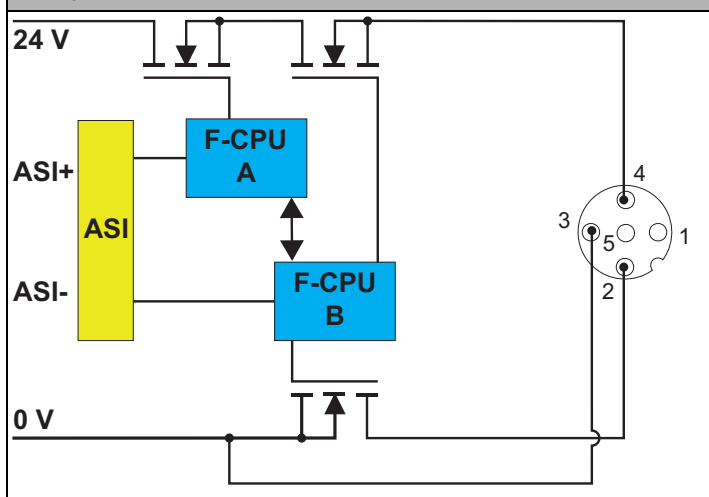
Signal name	Explanation
Ix	standard input x
Sx	safety input x, configurable as OSSD, antivalent OSSDs, floating contacts or standard input
SOx	safety output x
T1, T2	clock output
24 V _{ext.out}	power supply, out of external voltage, positive pole
0 V _{ext.out}	power supply, out of external voltage, negative pole
n.c.	not connected

Connections

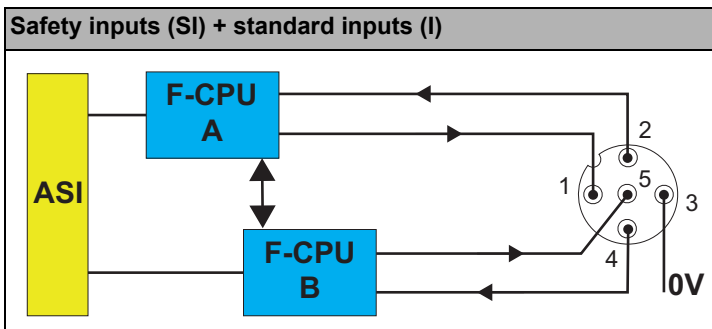
Article no.	M12 connect.	Marking	Pin1	Pin2	Pin3	Pin4	Pin5		
BWU3064	X1	I1	24 V _{ext.out}	I2	0 V _{ext.out}	I1	n.c.	X1	
	X2	I2	24 V _{ext.out}	n.c.	0 V _{ext.out}	I2	n.c.	X2	
	X3	S11/S12	standard	24 V _{ext.out}	I5	0 V _{ext.out}	I3	n.c.	X3
			float. cont.	T2	S12	n.c.	S11	T1	X4
	X4	S21/S22	standard	24 V _{ext.out}	I6	0 V _{ext.out}	I4	n.c.	X5
			float. cont.	T2	S22	n.c.	S21	T1	X6
	X5	SO1	OSSD	24 V _{ext.out}	S22	0 V _{ext.out}	S21	n.c.	X7
			standard	n.c.	SO1-	0 V _{ext.out}	SO1+	n.c.	X8
	X6	SO2	n.c.	SO2-	0 V _{ext.out}	SO2+	n.c.	MP	
	X7	SO3	n.c.	SO3-	0 V _{ext.out}	SO3+	n.c.	ADDR	
X8	SO4	n.c.	SO4-	0 V _{ext.out}	SO4+	n.c.			
ADDR	connection for ASi-3 addressing plug (protection cap)								
MP	memory plug (protection cap)								



Safety outputs (SO)



ASi Safety Output Module with ASi Diagnostic node



Programming instructions (ASi bit assignment for safe inputs)

Bit	D3	D2	D1	D0
Safe input SI1 (S11/S12)	S12	S12	S11	S11
Safe input SI2 (S21/S22)	S22	S22	S21	S21

Programming instructions (bit assignment of ASi standard I/O nodes)

Programming	ASi bit assignment			
	D3	D2	D1	D0
Bit	D3	D2	D1	D0
	input			
Node 1	I4	I3	I2	I1
Node 2	not used	not used	I6	I5
	output			
Node 1	if P0=1: SO4	if P0=1: SO3	if P0=1: SO2	if P0=1: SO1
Node 2	not used	not used	not used	not used
	parameter bit			
	P3	P2	P1	P0
Node 1	not used	not used	not used	0: no influence on SO _n 1: switches output SO _n on, if safety release ⁽¹⁾ is active and bit D _{n-1} = 1
Node 2	not used	not used	not used	not used

⁽¹⁾ see table „Release conditions“

Programming instructions (Bit values of the ASi diagnostic node 1, 2, 3 and 4)

Bit	ASi Output	Bit	ASi Input
O3	inexistent	I3	Parameter P2 1: response input I _x (x = 1 ... 4) 0: response of state of release
O2	not used	I2	diagnostics (for definition see table „Device colors“)
O1	not used	I1	
O0	Parameter P1=1 not used	I0	
	Parameter P1=0 1: switches output SO _n on, if the safety release ⁽¹⁾ is active 0: switches output SO _n off, even if the safety release ⁽¹⁾ is active		

Peripheral fault indicates missing 24 V_{ext}.

⁽¹⁾ see table „Release conditions“

ASi Safety Output Module with ASi Diagnostic node

Programming instructions (bit values of the ASi parameter, diagnostic node)

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

⁽¹⁾ see table „Release conditions“

Release conditions

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

Diagnostics (device colors)

Value	Color	Description	State change	LED SO _n
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 is 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

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LED status display

LED	State	Signal / Description
AUX (green)		no 24 V _{DC} AUX
		24 V _{DC} AUX present
ASi (green)		no ASi voltage
	1 Hz	ASi voltage present, but at least one ASi node is addressed „0“ or peripheral fault
		ASi voltage present
FLT (red)		ASi communication OK (at least one ASi node online)
	1 Hz	at least one ASi node with peripheral fault
		no data exchange (with at least one correctly addressed ASi node)
I1, I2 (yellow)		input is switched off
		input is switched on
MP (green / yellow / red)		no chip card plugged in or chip card defect
	1 Hz	copying configuration from chip card to unconfigured module or from module to empty chip card
		chip card plugged in and recognized
		configuration on chip card and device different or configuration incompatible with the device, user intervention is required.
S11 ... S22 (yellow)		safety input is switched off
	1 Hz	cross-connection
	8 Hz	internal error or double address
		safety input is switched on
SO1 ... SO4 (yellow)		safety output is switched off
	1 Hz	restart block, waiting for the start signal to switch on the safety output again
	8 Hz	unlockable error state; waiting for "reset of error condition signal", after receiving the signal the device turns into normal operation
		safety output is switched on
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 disconnection of the power supply (Power ON Reset).

ASi Safety Output Module with ASi Diagnostic node



Accessories:

- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BWU2916)
- ASi substructure module (CNOMO) for 8 channel module in 60 mm housing (art. no. BWU2351)
- Memory Plug, memory capacity 32 kByte (art. no. BW3241)
- Universal protection cap ASi-5/ASi-3 for M12 sockets, IP67 (art. no. BW4056)
- Memory plug cover (art. no. BW3155)
- Sealing profile IP67 (IDC plug), 60 mm (art. no. BW3282)
- Passive Distributor AUX to 1 x M12 cable plug, straight, 4 poles, depth 19 mm, IP67, optimized for load currents ≥ 100 mA (art. no. BWU4725)
- Passive Distributor AUX to 1 x M12 cable plug, straight, 4 poles, depth 19 mm, IP67, optimized for load currents ≤ 100 mA (art. no. BWU4760)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)