


## ASi Safety Output Module

Safe outputs and standard inputs in one module

Protection category IP20



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

**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:**

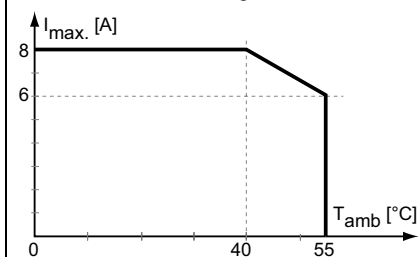
AB Slave (max. 62 AB Slaves/ASi network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/ASi network), mixed use allowed (upon request, slaves are available with specific ASi Slave profiles).

<b>Article no.</b>	<b>BWU2836</b>
<b>Connection</b>	
Connection	COMBICON plug
Length of connector cable	unlimited <sup>1</sup>
<b>ASi</b>	
Profile	configuration slave: S-7.A.5 4I/4O slaves: S-7.A.7 diagnostics slaves: 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
<b>AUX</b>	
Voltage	20 ... 30 V (PELV)
Max. current consumption	8 A
<b>Inputs</b>	
Number	8 digital inputs
Power supply	out of AUX
Input level	U < 5 V (low) U > 15 V (high)
<b>Outputs</b>	
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, $\Sigma = \text{max. } 8 \text{ A}$ (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
<b>Display</b>	
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 <sub>DC</sub> AUX on off: no 24 V <sub>DC</sub> AUX
<b>Environment</b>	
Applied standards	EN 62026-2:2013 EN 61508:2010 EN 62061:2005/A1:2013 EN ISO 13 849-1:2008/AC:2009 EN 60529
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

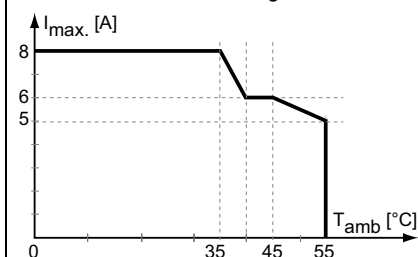
<sup>1</sup> loop resistance ≤ 150 Ω

## 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.

## Diagnostic slave 1-8 (depending on number of release circuits)

### Bit setting of in- and outputs

Bit	ASi output	Bit	ASi input
O0	Parameter P1=1	I0	Diagnostic (see table („Diagnostic (device colors)“))
	Parameter P1=0		
	not used		
	1: output controlled by safety release		
	0: inhibits output on irrespective of safety release		
O1	not used	I1	
O2	not used	I2	
O3	inexistent	I3	Parameter P2=0
			Parameter P2=1
			1: feedback for user: safety release on
			0: feedback for user: safety release off
			In <sup>1</sup>

Peripheral fault indicates unavailable AUX or overload on the outputs

<sup>1</sup> state of the assigned input.

## Release conditions

Diagnostic slaves			Standard I/O slaves		
			Slave 1		
			Parameter P0 = 0	Parameter P0 = 1	
				Bit D <sub>n-1</sub> = 0	Bit D <sub>n-1</sub> = 1
Slave 1 ... 4	Parameter P1 = 1	SO <sub>n</sub> = release	SO <sub>n</sub> = off	SO <sub>n</sub> = release	
	Parameter P1 = 0	SO <sub>n</sub> = release	SO <sub>n</sub> = off	SO <sub>n</sub> = release	
	Bit O0 = 0	SO <sub>n</sub> = off	SO <sub>n</sub> = off	SO <sub>n</sub> = off	

Diagnostic slaves			Standard I/O slaves		
			Slave 2		
			Parameter P0 = 0	Parameter P0 = 1	
				Bit D <sub>n-1</sub> = 0	Bit D <sub>n-1</sub> = 1
Slave 5 ... 8	Parameter P1 = 1	SO <sub>n</sub> = release	SO <sub>n</sub> = off	SO <sub>n</sub> = release	
	Parameter P1 = 0	SO <sub>n</sub> = release	SO <sub>n</sub> = off	SO <sub>n</sub> = release	
	Bit O0 = 0	SO <sub>n</sub> = off	SO <sub>n</sub> = off	SO <sub>n</sub> = off	

## Diagnostic (device colors)

Value	Color	Description	State change	LED SO <sub>n</sub>
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 diagnostic slave (bit setting)

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

<sup>1</sup> state of the assigned input.

## 4I/4O slave

### Programming 4I/4O slaves (bit setting)

Bit	ASi output		Bit	ASi output	
	Slave 1	Slave 2		Slave 1	Slave 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

Programming instructions 4I/4O slave (bit setting)	
<b>Bit P0</b>	
P0=1	safety output controlled by safety release and output bit = 1
P0=0	safety output controlled by safety release only
<b>Bits P1, P2,P3:</b>	
not used	

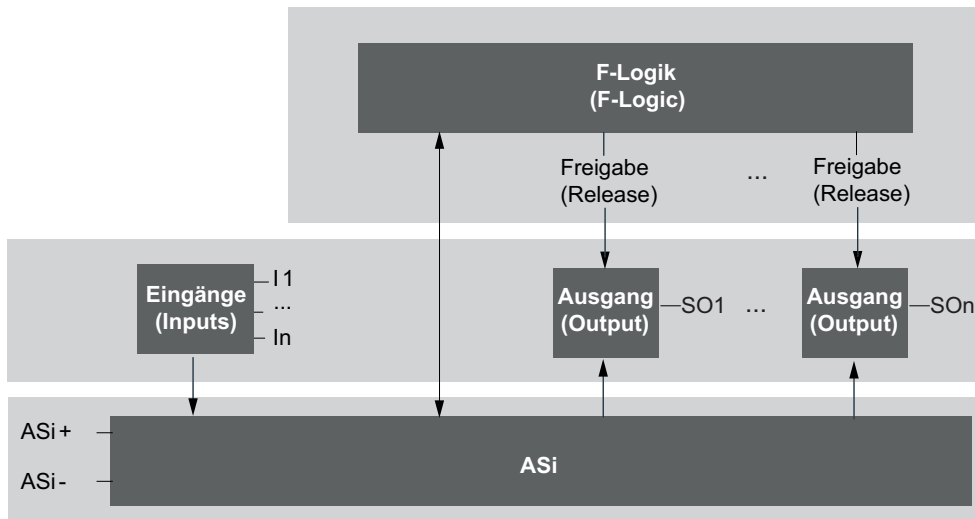
## Configuration slave

Programming hints			
Bit	ASi output	Bit	ASi input
<b>00,</b> <b>01</b>	communication CTT2	<b>10,</b> <b>11</b>	not used
<b>02,</b> <b>03</b>	LED ALARM not used	<b>12,</b> <b>13</b>	communication CTT2

Peripheral fault indicates unavailable AUX.

BWU2836	Clamps	Description
	Ix	digital input x
	SOx	safe output x
	ASi +, ASi -	connection to the ASi bus
	AUX + <sub>ext.in</sub>	supply voltage out of external 24 V, positive pole
	AUX - <sub>ext.in</sub>	supply voltage of external 24 V, negative pole

## Block diagram



As long as the F-logic has - by means of the safe ASi output slaves- released, the physical outputs can be switched via the data bits of the 4I/4O slaves 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 slave. However, it is also possible to install one safe ASi output slave for each single physical output. Each intermediate setting is possible, e.g. one safe ASi output slave for 2 physical outputs.