

# AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

**Safety + standard I/O in one module**

**Safety relay output with galvanically isolated contact sets, approved up to 230 V**

**Additionally 1 EDM input, 1 x 2 channel safe input**

**IEC 61508 SIL 3, EN ISO 13849-1/PLe Cat 4, EN 62061 SIL 3**

**Protection category IP20**



(Figure similar)

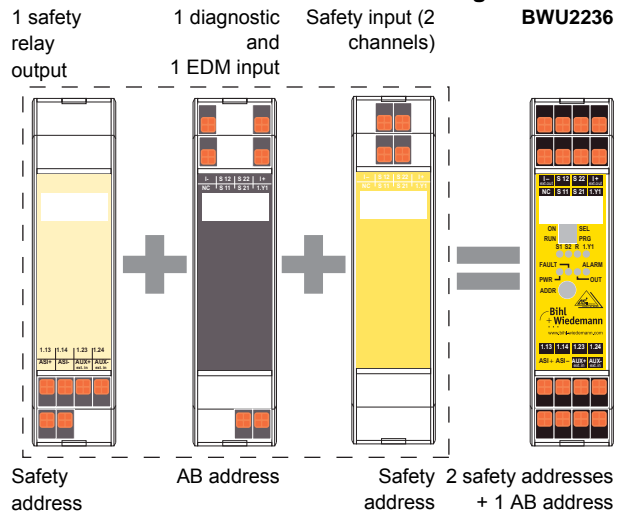


## Article no. BWU2236 AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

The stainless steel AS-i Safety Monitor controls the safety relays of the AS-i Safety Relay Output Module by using a safety AS-i single address. To set the safety AS-i address, the dip-switch has to be in the ON/PRG position. Addressing can then be accomplished by using an AS-i addressing device, for example. Several AS-i Safety Relay Output modules can have the same safety address and can be controlled via this same safety address on a AS-i circuit. All AS-i Safety Relay Output Modules with the same safety address are controlled simultaneously.

In addition to the safety single address the module also supports an AB-address e.g. used to transmit the states of the standard inputs and a safety input address.

### BWU2236: 3 AS-i modules in one housing!



<b>Article no.</b>	<b>BWU2236</b>
<b>Connection</b>	
Connection	4 x COMBICON
Length of connector cable	unlimited <sup>(1)</sup>
<b>AS-i</b>	
Profile	diagnostic AB slave: S-7.A.E; $5_{hex}$ (default), value adjustable safety input S-7.B.0; $F_{hex}$ (default), value adjustable
Address	2 single slaves + 1 AB slave
Required master profile	$\geq M3$
As of AS-i specification	2.1
Operating voltage	30 V <sub>DC</sub> (18 ... 31,6 V)
Max. current consumption	< 200 mA

# AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

<b>Article no.</b>	<b>BWU2236</b>
<b>AUX</b>	
Voltage	24 V <sub>DC</sub> (± 20%)
Current input out of AUX <sub>ext. in</sub>	< 30 mA
<b>Input</b>	
Number	1 EDM, diagnostic, 1 x 2 channel safe input (cat. 4 / SIL 3)
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AUX
Power supply of attached sensors	30 mA
Max. resistance between S 11 - S12; S 21 - S 22	150 Ω
Current capacity max. I+	max. 30 mA
External device monitoring (EDM)	reference potential over I+, I-
<b>Output</b>	
Number	1 relay output max. contact load: 3 A DC-13 at 24 V or 3 A AC-15 at 230 V
Max. output current	max. 3 A
Max. inrush current	20 A for 20 ms
<b>Number of switching operations</b>	
Usage category (EN 60347-4-1 / EN 60947-5-1)	AC1: 230V/3A (ca. 150 x 10 <sup>3</sup> cycles) AC 15: 230V/3A (ca. 80 x 10 <sup>3</sup> cycles) DC 1: 24V/3A (ca. 500 x 10 <sup>3</sup> cycles) DC 13: 24V/3A/0,1 Hz (ca. 50 x 10 <sup>3</sup> cycles)
<b>Display</b>	
LED S1, S2 (yellow)	state of safety inputs (S 11 - S 12, S 21 - S 22)
LED R (yellow)	release status
LED 1.Y.1 (yellow)	state of EDM input 1.Y1
LED PWR (green)	AS-i voltage ON
LED FAULT (red)	AS-i Fault
LED OUT (yellow)	for definition see table "device colors"
LED ALARM (red)	PLC indicates alarm
<b>Environment</b>	
Applied standards	IEC 61508 SIL 3 EN ISO 13849-1 PLe cat 4 EN 62061 SIL 3 EN 60529
Operating height max.	2000 m
Ambient temperature	-30 °C ... +55 °C <sup>(2)</sup> , no condensation permitted
Storage temperature	-25 °C ... +85 °C
Pollution Degree	2
Protection category	IP20
Tolerable loading referring to humidity	according to EN 61131-2
Housing	plastic, Din-rail mounting
Voltage of insulation (relay contact for AS-i resp. AUX <sub>ext. in</sub> )	≥6 kV
Voltage of insulation AS-i to AUX <sub>ext. in</sub>	≥500 V
Weight	150 g
Dimensions (L / W / H in mm)	22,5 / 99 / 114

(1) loop resistance ≤ 150 Ω

(2) temperature range up to -30°C from Ident.No. ≥16368

# AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

## Wiring rules

Push-in terminals	
<b>General</b>	
Nominal cross section	2,5 mm <sup>2</sup>
<b>Conductor cross section</b>	
Conductor cross section solid	0,2 ... 2,5 mm <sup>2</sup>
Conductor cross section flexible	0,2 ... 2,5 mm <sup>2</sup>
Conductor cross section flexible, with ferrule	without plastic sleeve: 0,2 ... 2,5 mm <sup>2</sup>
	with plastic sleeve: 0,25 ... 2,5 mm <sup>2</sup>
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0,5 ... 1,5 mm <sup>2</sup>
AWG	24 ... 14
Stripped insulation length	10 mm

## Diagnostic Slave (Programming instructions (Bit values of the inputs/outputs, AB slave))

Bit	AS-i output	Bit	AS-i input
O0	1: Alarm LED <i>on</i> 0: Alarm LED <i>off</i>	I0	Diagnostic (for definition see table "device colors")
O1	Parameter P1=1 not used	I1	Parameter P1=0 1: output controlled by safety release 0: inhibits output on irrespective of safety release
	1: output controlled by safety release 0: inhibits output on irrespective of safety release		
O2	not used	I2	
O3	inexistent	I3	Parameter P2=0 1: feedback for user: <i>safety release on</i> 0: feedback for user: <i>safety release off</i>
			Parameter P2=1 1.Y1

Peripheral fault indicates unavailable 24 V ext.

## Diagnostic (device colors)

Value	Color	Description	State change	LED "Out"
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"	auxiliary signal 1	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 O1	off

## Programming instructions Diagnostic Slave (bit values of the AS-i parameter)

<b>Bit P1</b>	
P1=1	safety output controlled by safety release only
P1=0	safety output controlled by output O1 in addition to safety release
<b>Bit P2</b>	
P2=1	input 1.Y1 at AS-i bit I 3
P2=0	feedback for user: release <i>on</i>
<b>Bits P0, P3:</b>	
	not used

# AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

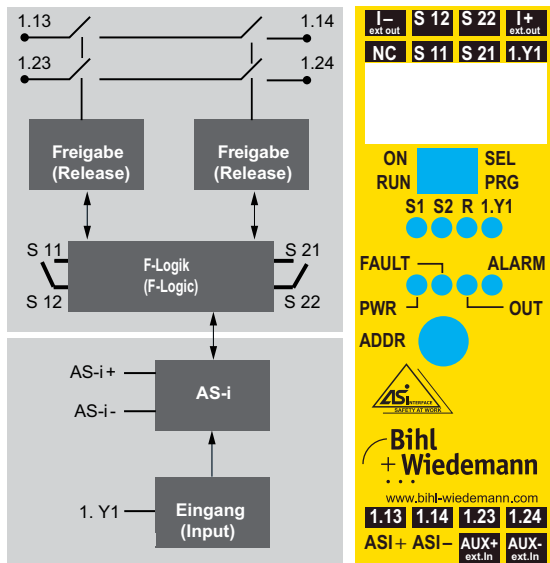
Release		AS-i Safety Relay Output Module, safety release from the AS-i safety monitor...	
		... not received	... received
AS-i parameter (AB slave) changes the function of output bit O1	AS-i Parameter P1=1 (default) O1=0	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=1 O1=1	safety output contact set open	safety output contact set closed
	AS-i Parameter P1=0 O1=0	safety output contact set open	safety output contact set open
	AS-i Parameter P1=0 O1=1	safety output contact set open	safety output contact set closed

## Safety input (Programming instructions (bit values of the safety input address))

Bit	AS-i output	Bit	AS-i input
	outputs not used	I0, I1	safety input S 1
		I2, I3	safety input S 2






















Peripheral fault indicates cross-connection between the safety inputs.

## Operating elements and clamp assignment



Clamps	Description
S11, S12, S21, S22	safety input clamps
1.13, 1.14	safety output contact set 1
1.23, 1.24	safety output contact set 2
I <sup>-</sup> ext. out	reference potential for EDM-/start input (1.Y1)
I <sup>+</sup> ext. out	
1.Y1	EDM / start input
AS-i+, AS-i-	AS-i network connection
AUX <sup>+</sup> ext.in	voltage supply for safety input (24V <sub>DC</sub> ext.)
AUX <sup>-</sup> ext.in	

## AS-i Safety Relay Output Module with Diagnostic Slave, 1 EDM, 1 x 2 channel Safe Input

LEDs	State	Signal / Description
PWR (green)		no operating voltage
	 1 Hz	operating voltage present, safety-related AS-i address and/or AS-i AB address is „0“ or no 24V ext. in (auxiliary power)
		operating voltage present
FAULT (red)		AS-i communication OK
		no 24V ext. in (auxiliary power)
		no data exchange with AB slave and/or safety-related AS-i address
OUT (yellow)		output relays contacts open
	 1 Hz	restart inhibit, waiting for the start signal, the output relays switch-on after the start signal
	 8 Hz	device is in unlockable error state. Waiting for "reset of error condition signal". After receiving this signal the device follows up with normal operation.
		output relays contacts closed
ALARM (red)		AS-i output bit 0 is <i>not</i> set
		AS-i output bit 0 is set
S1, S2, 1.Y1 (yellow)		the corresponding input is <i>not</i> connected
		the corresponding input is connected
S1, S2 (yellow)	 2 Hz	cross-connection at the safety inputs
R (yellow)		release not issued
		release issued
S1, S2, R, 1.Y1 (yellow)	 (running light)	switch is adjust to ON/PRG position
 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-run disconnection of the power supply (Power ON Reset).

### Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)