

# AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

## AS-i 3.0 Gateways with integrated Safety Monitor

2 / 1 AS-i Master, PROFIBUS Slave

1 AS-i Safety Monitor for 2 AS-i networks

- Operation using a single Monitor configuration!  
Monitor processes safety slaves on two AS-i networks  
Coupling between the two networks superfluous



(Figure similar)

Up to 16 release circuits

- up to 4 CAT4, SIL 3 safe output circuits on the Monitor  
safe relays or fast electronic safe outputs

Safe AS-i outputs are supported

- up to 16 independent AS-i outputs  
Multiple safe AS-i outputs possible via a single AS-i address

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



Figure	Type	Inputs safety, expandable to	Outputs Safety, SIL 3, cat. 4	Safety outputs, independent according to SIL 3, expandable to	Safety communication	Number of AS-i networks, number of AS-i Master <sup>1</sup>	1 power supply, 1 gateway for 2 AS-i networks, inexpensive power supplies <sup>2</sup>	Diagnostic and configuration interface <sup>3</sup>	Article no.
	Safety, PROFIBUS	max. 62 x 2 channels	4 release circuits; 2 x relay, 2 x fast electronic safe outputs	max. 16	-	2 AS-i networks, 2 AS-i masters	yes, max. 4 A/ AS-i network	RS 232	<b>BWU2002</b>
	Safety, PROFIBUS	max. 62 x 2 channels	4 release circuits; 2 x relay, 2 x fast electronic safe outputs	max. 16	-	2 AS-i networks, 2 AS-i masters	no, max. 8 A/ AS-i network, redundant supply	RS 232	<b>BWU2001</b>
	Safety, PROFIBUS	max. 62 x 2 channels	4 release circuits; 2 x relay, 2 x fast electronic safe outputs	max. 16	-	2 AS-i networks, 1 AS-i master	no, max. 8 A/ AS-i network, redundant supply	RS 232	<b>BWU2003</b>
	Safety, PROFIBUS	max. 62 x 2 channels	4 release circuits; 2 x relay, 2 x fast electronic safe outputs	max. 16	-	2 AS-i networks, 1 AS-i master	yes, max. 4 A/ AS-i network	RS 232	<b>BWU2004</b>
	Safety, PROFIBUS	max. 62 x 2 channels	2 release circuits; 2 x 2 relay	max. 16	-	2 AS-i networks, 1 AS-i master	no, max. 8 A/ AS-i network, redundant supply	RS 232	<b>BWU2187</b>
	Safety, PROFIBUS	max. 62 x 2 channels	2 release circuits; 2 x 2 relay	max. 16	-	2 AS-i networks, 1 AS-i master	yes, max. 4 A/ AS-i network	RS 232	<b>BWU2188</b>

<sup>1</sup> Number of AS-i networks, number of AS-i Master: Safety devices:

"Double Master": 2 AS-i networks, 2 AS-i Masters.

"Optional AS-i Safety coupling circuit": 2 AS-i networks, 1 AS-i Master.

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## 2 1 power supply, 1 gateway for 2 AS-i networks, inexpensive power supplies:

"yes, max. 4 A/AS-i network": Cost-effective power for 2 AS-i networks with 1 power supply (optionally supply of multiple Single Gateways by 1 power supply).

"no, max. 8 A/AS-i network, redundant supply": 1 power supply per AS-i network. Gateway is powered in normal operation from one of the two AS-i power supplies. Should one AS-i power supply fail, switching to the other AS-i power supply allows all the diagnostics functions to be maintained and the unaffected AS-i network continues to operate.

## 3 Diagnostic and configuration interface

"RS 232": Access to AS-i master and safety monitor via Bihl+Wiedemann proprietary software over RS 232 interface and adapter cable. **GSD file for the Gateway is built into the web server.**

Article no.	BWU2001 / BWU2002 / BWU2003 / BWU2004	BWU2187 / BWU2188
<b>Interface</b>		
PROFIBUS interface	according to IEC 61158 / IEC 61784-1	
Baud rates	9,6 Kbaud up to 12 000 Kbaud, automatic recognition	
DP functions	imaging of the AS-i slaves as I/O data of the PROFIBUS complete diagnosis and configuration via the PROFIBUS DP	
<b>AS-i</b>		
AS-i cycle time	150 $\mu$ s * (number of slaves + 2)	
Operating voltage	AS-i voltage 30 V <sub>DC</sub>	
<b>Display</b>		
LCD	menu, indication of slave addresses and error messages in plain text	
LED power	power ON	
LED PROFIBUS	PROFIBUS communication active	
LED config error	configuration error	
LED U AS-i	AS-i voltage o.k.	
LED AS-i active	AS-i normal operation active	
LED prg enable	automatic addresses programming enabled	
LED prj mode	configuration mode active	
LED AUX	auxiliary power	–
LEDs 1.Y1, 1.Y2, 2.Y1, 2.Y2 (EDM/Start)	state of inputs: off: open on: closed	–
LEDs K1 ... K4	state of outputs: off: open on: closed	–
<b>UL-specifications (UL508)</b>		
External protection	an isolated source with a secondary open circuit voltage of $\leq 30$ V <sub>DC</sub> 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.	
cTÜV <sub>us</sub>	the devices • BWU2001 • BWU2002 • BWU2003 • BWU2004 • BWU2187 • BWU2188  from Bihl + Wiedemann GmbH were safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meet the safety requirements for the North American market.	
Applied standards	EN 61000-6-2 EN 61000-6-4 EN 62061:2005, SIL 3 EN 61508:2010/A1:2013, SIL 3 EN ISO 13849-1:2008/AC:2009, performance-level e	

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Article no.	BWU2001 / BWU2002 / BWU2003 / BWU2004	BWU2187 / BWU2188
<b>Environment</b>		
Operating altitude	max. 2000 m	
Ambient temperature	0 °C ... +55 °C	
Storage temperature	-25 °C ... +85 °C	
Housing	stainless steel, for DIN rail mounting	
Protection category (EN 60529)	IP20	
Maximum tolerable shock and vibration stress	according EN 61131-2	
Voltage of insulation	≥ 500 V	
Weight	800 g	
Dimensions (W / H / D in mm)	100 / 120 / 96	

Article no.	BWU2187 / BWU2188	BWU2001 / BWU2002 / BWU2003 / BWU2004
<b>Safety monitor</b>		
Start delay	< 10 ms	
Max. turn-off time	< 40 ms	
Card slot	Chip card for storage of configuration data	
<b>Connection</b>		
Connection	COMBICON	
Length of connector cable	I/O: max. 15 m	
<b>Input</b>		
Inputs digital, EDM	4	
Switching current	statical 4 mA at 24 V, dynamic 30 mA at 24 V (T=100 µs)	
Power supply	out of AS-i	
<b>Output</b>		
Number of release circuits on the monitor	2	4
Outputs	relay outputs (output circuits 1 and 2), each 2 current paths max. contact load <sup>1</sup> : 3 A <sub>AC-15</sub> at 30 V, 3 A <sub>DC-13</sub> at 30 V	relay outputs (output circuits 1 and 2) max. contact load <sup>1</sup> : 3 A <sub>AC-15</sub> at 30 V, 3 A <sub>DC-13</sub> at 30 V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5 A <sub>DC-13</sub> at 30 V
Power supply (semiconductor outputs)	–	out of AUX
Test pulse (semiconductor outputs)	–	if output is on: minimum interval between 2 test pulses: 250 ms (as from Safety Version 4.3); maximum pulse width 1,5 ms

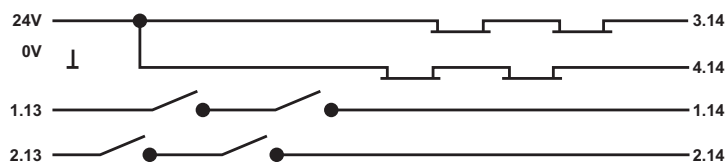
<sup>1</sup> Protection via external fuse, max. 4 A semi time-lag.

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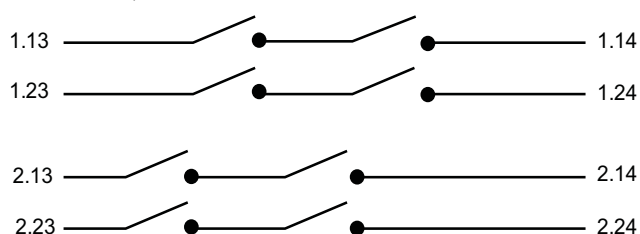
Article No.	Operating current		
	master power supply, approx 300 mA out of AS-i network	master power supply, max. 300 mA out of AS-i circuit 1 (approx. 70 mA ... 300 mA), max. 300 mA out of AS-i circuit 2 (approx. 70 mA ... 300 mA); in sum max. 370 mA	Version „1 gateway, 1 power supply, for 2 AS-i networks“, approx. 300 mA (PELV voltage)
BWU2001	-	•	-
BWU2002	-	-	•
BWU2003	•	-	-
BWU2004	-	•	-
BWU2187	•	-	-
BWU2188	-	•	-

	BWU2001 / BWU2003 / BWU2187	BWU2002 / BWU2004 / BWU2188
Redundant power supply out of AS-i: all fundamental functions of the device remain available even in case of power failure in one of the two AS-i networks	•	-
Current measurement of the AS-i circuits	-	-
Self-resetting adjustable fuses	-	-
AS-i earth fault monitor distinguishes between AS-i cable and sensor cable	-	-
In version „1 gateway, 1 power supply for 2 AS-i circuits“: only 1 gateway + 1 AS-i power supply is needed for both 2 AS-i circuits	-	•

## Safety outputs block diagram BWU2001, BWU2002, BWU2003, BWU2004



## Safety outputs block diagram BWU2187, BWU2188



# AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor

## Connections: Gateway + Safety Monitor



## AS-i 3.0 PROFIBUS Gateways with integrated Safety Monitor



### Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- ASIMON 3 G2 and AS-i Control Tools with serial cable for AS-i Masters/Monitors in stainless steel (art. no. BW2071)
- PROFIBUS DP Master Simulator (art. no. BW1257)
- AS-i Power Supply 4 A (art. no. BW1649) / AS-i Power Supply 8 A (art. no. BW1997)