AS-i 3.0 PROFINET-Gateways with integrated Safety Monitor

Bihl+Wiedemann

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2 AS-i Master, 1 PROFINET Slave

Up to 32 release circuits
- up to 6 safe output circuits on the Monitor
  safe relays or fast electronic safe outputs
- up to 32 independent AS-i outputs
  Multiple safe AS-i outputs possible via a single AS-i address

1 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

Safe Link via PROFINET fieldbus interface

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data

BWU2633   BWU2634, BWU3275

Figure	Type	Inputs safety, expandable to	Outputs Safety, SIL 3, cat. 4	Safety outputs, independent according to SIL 3, expandable to	Safety communi-cation	Number of AS-i networks, number of AS-i Master [1]	1 power supply, 1 gateway for 2 AS-i networks, inexpensive power sup-plies [2]	Diagnostic and configuration interface [3]	Power-Boost [4]	Article No.
	Safety, PROFI-NET	max. 62 x 2 channels, max. 1922 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 32, max. 992 in max. configuration	Safe Link	2 AS-i networks, 2 AS-i Masters	yes, max. 4 A/ AS-i network	Ethernet fieldbus + RS 232	yes	**BWU3274**
	Safety, PROFI-NET	max. 62 x 2 channels, max. 1922 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 32, max. 992 in max. configuration	Safe Link	2 AS-i networks, 2 AS-i Masters	yes, max. 4 A/ AS-i network	Ethernet fieldbus + RS 232	no	**BWU2634**
	Safety, PROFI-NET	max. 62 x 2 chan-nels, max. 1922 in max. configuration	—	max. 32, max. 992 in max. configuration	Safe Link	2 AS-i networks, 2 AS-i Masters	yes, max. 4 A/ AS-i network	Ethernet fieldbus + RS 232	no	**BWU2633**

[1] **Number of AS-i networks, number of AS-i Master**
"Double Master": 2 AS-i networks, 2 AS-i Masters.

[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 Gate-ways by 1 power supply).

[3] **Diagnostic and configuration interface**
"Ethernet fieldbus + RS 232": Access to AS-i master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet field-bus interface or RS 232 interface and adapter cable. **GSDML file for the Gateway is built into the web server.**

[4] Ruggedized power supply for stable supply of load-dependent currents on AS-i.

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Article no.	BWU2634 / BWU3274	BWU2633
Interfaces		
PROFINET interface	2 x RJ-45, integrated 2-Port-Switch, IRT capability	
Conformance Class	B	
Baud rates	10/100 MBaud	
Function	PROFINET IO Device Media Redundancy Protocol (MRP) Shared Device	
Diagnostic and configuration interface	PROFINET fieldbus interface + RS232	
Card slot	Chip card for storage of configuration data	
AUX		
Operating voltage	24 V$_{DC}$ (19,2 ... 28,8 V)	—
Max current consumption	7,2 A	—
AS-i		
AS-i specification	3.0	
Cycle time	150 µs * (number of slaves + 2)	
Operating voltage	30 V$_{DC}$ (20 ... 31,6 V) (PELV voltage)	
AS-i Power24V capability [(1)]	yes	
Display		
LCD	indication of slave addresses and error messages in plain text	
LED power (green)	power on	
LED PROFINET (green)	green: PROFINET communication active red: PROFINET communication not active	
LED config error (red)	configuration error	
LED U AS-i (green)	AS-i voltage OK	
LED AS-i active (green)	AS-i normal operation active	
LED prg enable (green)	automatic addresses programming enabled	
LED prj mode (yellow)	configuration mode active	
LED AUX (green)	auxiliary power	—
LEDs SI1 ... SIn (green)	state of inputs: off: open on: closed	—
LEDs SO1 ... SOn (green)	state of outputs: off: open on: closed	—
UL-specifications (UL508)		
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.	
Applied standards	EN60529 EN 61 000-6-2 EN 61 000-6-4 EN 62 061:2005, SIL 3 EN 61 508:2010, SIL 3 EN ISO 13 849-1:2008, Performance-Level e	
Ambient		
Ambient temperature	0 °C … +55 °C	
Storage temperature	-25 °C … +85 °C	
Housing	stainless steel, for DIN-rail mounting	
Protection category	IP20	
Tolerable loading referring to impacts and vibrations	according EN 61131-2	
Voltage of insulation	≥ 500 V	
Weight	800 g	
Dimensions (W / H / D in mm)	109 / 120 / 96	86 / 120 / 96

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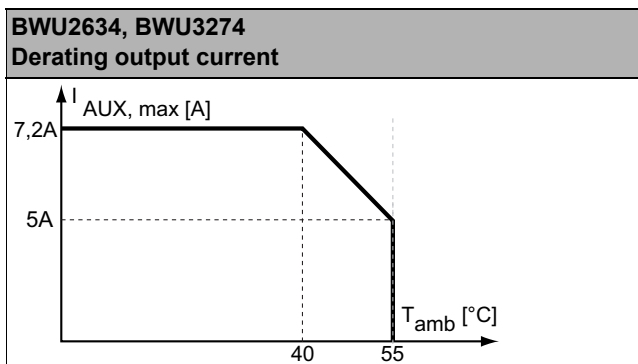
(1) **AS-i Power24V**
The device can be operated directly on a 24 V (PELV) power supply. The gateway has been optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use of powerful 24 V power supplies.

Article no.	BWU2634 / BWU3274	BWU2633
Safety Monitor		
Start delay	< 10 ms	
Max. turn-off time	< 40 ms	
Connection		
Connection	COMBICON	
Length of connector cable	unlimited [1]	–
Input		
Inputs Safety, SIL3, cat. 4	3 x 2 channels [2]	–
Inputs digital, EDM	up to 6 standard inputs [2]	–
Switching current	statical 4 mA at 24 V, dynamic 15 mA at 24 V (T = 100 µs)	–
Power supply	out of AUX	–
Tolerated test pulse	adjustable	–
Output		
Number of release circuits in device	6	–
Outputs	semiconductor output max. contact load: 1,2 A_{DC-13} at 30 V, Σ= 7,2 A in sum [3]	–
Power supply (semiconductor outputs)	out of AUX	–
Test pulse (semiconductor outputs)	if output is on: minimum interval between 2 test pulses: 250 ms; maximum pulse width 1 ms	–

[1] loop resistance ≤ 150 Ω

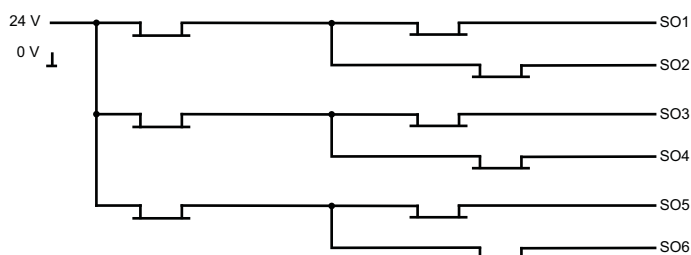[2] see "Variations of terminal connection BWU2634, BWU3274"

[3]

BWU2634, BWU3274
Derating output current

	Operating current		
Article No.	**master power supply, approx 300mA out of AS-i network**	**master power supply, max. 300mA out of AS-i circuit 1 (approx. 70mA ... 300mA), max. 300mA out of AS-i circuit 2 (approx. 70mA ... 300mA); in sum max. 370mA**	**Version „1 Gateway, 1 Power supply, for 2 AS-i Networks", approx. 300mA (PELV voltage)**
BWU2633	–	–	•
BWU2634	–	–	•
BWU3274	–	–	•

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	BWU2634 / BWU2633 / BWU3274
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 an sensor cable	●
In Version „1 Gateway, 1 Power supply, for 2 AS-i Networks": only 1 Gateway + 1 AS-i power supply for 2 AS-i networks required	●

Block diagram of semiconductor outputs BWU2634, BWU3274

Variations of terminal connection BWU2634, BWU3274

Terminal	Safe output	Safe input for mechanical contacts in combination with T1, T2 [1]	Safe antivalent input [1]	Safe electronic input [1]	Standard input [1]
SI1,2	–	●	●	●	●
SI3,4	–	●	●	●	●
SI5,6	–	●	●	●	●
SO1,2 [2]	●	●	●	–	●
SO3,4 [2]	●	●	●	–	●
SO5,6 [2]	●	●	●	–	●

[1]   Inputs may only be supplied by the same 24 V source as the device itself.

[2]   If outputs are configured as inputs, the input current has to be limited by an external element at ≤ 100 mA

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Connections: Gateway + Safety Monitor

BWU2634, BWU3274

Terminals	Description
SI1, SI3, SI5	safe input terminals (T1)
SI2, SI4, SI6	safe input terminals (T2)
T1	clock output 1
T2	clock output 2
SO1 ... SO6	safe semiconductor outputs1 ... 6
24V, 0V	power supply for local I/Os
+ASI 1-, +ASI 2-	connection of AS-i networks
ASI +PWR-	power supply for Gateway and AS-i networks

BWU2633

Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- PROFINET Master Simulator (art. no. BW3057)
- Bihl+Wiedemann Suite - Safety Software for Configuration, Diagnostics and Programming (art. no. BW2916)
- Power supplies, e.g.: AS-i power supply, 4 A (art. no. BW1649), AS-i power supply, 8 A (art. no. BW1997)
  (further power supply units can be found at *www.bihl-wiedemann.de/en/products/accessories/power-supplies*)

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