AS-i 3.0 POWERLINK Gateways with integrated Safety Monitor

AS-i 3.0 POWERLINK-Gateways with integrated Safety Monitor

2 / 1 Master, POWERLINK-Slave
• integrated switch

Up to 32 release circuits
• up to 6 release circuits SIL 3, Cat. 4 on the Monitor

Safe AS-i outputs are supported
• up to 64 independent AS-i outputs
  Multiple safe AS-i outputs possible via single AS-i address

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data

(Figure similar)

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 [1]	1 power supply, 1 gateway for 2 AS-i networks, inexpensive power supplies [2]	Diagnostic and configuration interface [3]	Article No.
	Safety, POWERLINK	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 diagnostics	**BWU3176**
	Safety, POWERLINK	max. 31 x 2 channels, max. 1891 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 31, max. 991 in max. configuration	Safe Link	1 AS-i network, 1 AS-i Master	yes, max. 4 A/ AS-i network	Ethernet diagnostics	**BWU3177**

[1] **Number of AS-i networks, number of AS-i Master**
"Single Master": 1 AS-i network, 1 AS-i Master.
"Doppel 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 Gateways by 1 power supply).

[3] **Diagnostic and configuration interface**
"Ethernet diagnostic": Access to AS-i master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet diagnostics interface.

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Article no.	BWU3176 / BWU3177
Interface	
Ethernet interface	RJ45
Baud rates	100 MBaud
AS-i	
AS-i specification	3.0
Cycle time	150 µs * (number of slaves + 2)
Operating voltage	30 V (20 … 31.6 V)
AS-i Power24V capability [(1)]	yes
AUX	
Operating voltage	24 V_{DC} (19,2 ... 28,8 V)
Max current consumption	7,2 A
Display	
LCD	indication of slave addresses and error messages in plain text
LED power (green)	power on
LED POWERLINK (green)	Ethernet communication 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
LED prg enable (green)	automatic addresses programming enabled
LED prj mode (yellow)	configuration mode active
LED AUX (green)	auxiliary power
LEDs SI1 ... SI6 (yellow)	state of inputs: LED off: open LED on: closed
LEDs SO1 ... SO6 (yellow)	state of inputs: LED off: offen LED 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	EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PLe EN 60529
Ambient	
Operating altitude	max. 2000 m
Ambient temperature	0 °C … +55 °C
Storage temperature	-25 °C … +85 °C
Pollution degree	2
Housing	stainless steel, for DIN-rail mounting
Protection category	IP20
Tolerable loading referring to humidity	according to EN 61131-2
Tolerable loading referring to impacts and vibrations	according EN 61131-2
Voltage of insulation	≥ 500V
Weight	800 g
Dimensions (W / H / D in mm)	109 / 120 / 106

[(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.
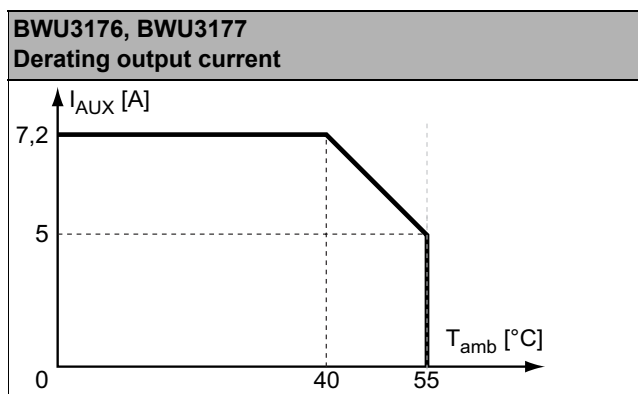
Article no.	BWU3176 / BWU3177
Safety Monitor	
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Card slot	Chip card for storage of configuration data
Connection	
Connection	COMBICON
Length of connector cable	unlimited [1]
Input	
Inputs Safety, SIL3, cat. 4	3 x 2 channels [2]
Inputs digital, EDM	up to 6 standard inputs [2]
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AUX
Tolerated test pulse	adjustable
Output	
Number of release circuits on the monitor	6
Outputs	semiconductor output max. contact load: 1,2 A_{DC-13} at 30 V, $\sum$ = 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

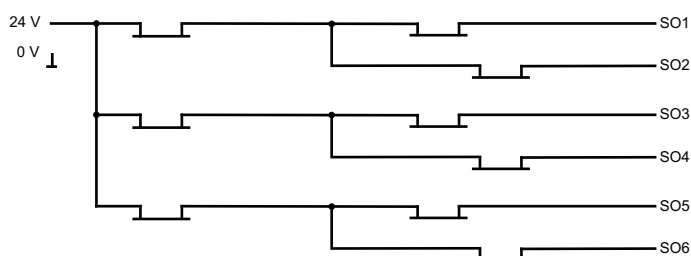[2] see "Variations of terminal configuration for BWU3176, BWU3177"

[3]

BWU3176, BWU3177
Derating output current

	Operating current		
Article no.	**Master power supply, ca. 300 mA out of AS-i circuits**	**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)**
BWU3176	–	–	●
BWU3177	–	–	●

	BWU3176 / BWU3177
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 BWU3176, BWU3177:

Variations of terminal configuration for BWU3176, BWU3177

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 ≤ 100mA (slow-blow fuse).

Bihl+Wiedemann GmbH · Floßwörthstr. 41 · D-68199 Mannheim · Phone: (+49) 621/33996-0 · Fax: (+49) 621/3392239 · eMail: mail@bihl-wiedemann.de

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Connections: Gateway + Safety Monitor:

BWU3176

Connection	Description
SI1, SI3, SI5	Safe input terminal (T1)
SI2, SI4, SI6	Safe input terminal (T2)
T1	Clock output 1
T2	Clock output 2
SO1 ... SO6	Safe semiconductor outputs 1 ... 6
24 V, 0 V	Power supply for local I/Os
+ASI 1-, +ASI 2-	Connection of AS-i circuit
ASI +PWR-	Power supply for Gateway and AS-i networks

BWU3177

Connection	Description
SI1, SI3, SI5	Safe input terminal (T1)
SI2, SI4, SI6	Safe input terminal (T2)
T1	Clock output 1
T2	Clock output 2
SO1 ... SO6	Safe semiconductor outputs 1 ... 6
24 V, 0 V	Power supply for local I/Os
+ASI 1-	Connection of AS-i circuits
ASI +PWR-	Power supply for Gateway and AS-i networks

Accessories:

- **Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)**
- **Bihl+Wiedemann Suite - Safety Software for Configuration, Diagnostics and Commissioning (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_)