ASi-5/ASi-3 openSAFETY over POWERLINK Gateway with integrated Safety Monitor

Bihl+Wiedemann

ASi-5 – Great data bandwidth, short cycle times

Compatible with all ASi generations

2 ASi-5/ASi-3 Master, POWERLINK-Device
• integrated hub

openSAFETY over POWERLINK

Up to 64 release circuits
• up to 6 release circuits SIL 3, cat. 4 on the Monitor, electronic safe outputs

Safe ASi outputs are supported
• up to 64 independent ASi outputs
Multiple safe ASi outputs possible via a single ASi address

OPC UA interface and REST API for IIoT applications

Integrated web server for simple diagnostics and maintenance

Selection of Mode of Safe Operation

Safe speed and standstill monitoring

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data

(Figure similar)

Figure	Interface, fieldbus	Inputs Safety, SIL 3, Kat. 4	Outputs Safety, SIL 3, cat. 4	ASi-5/ASi-3	ASi Safety	Safety communication	Number of ASi networks, number of ASi Master [1]	Integrated decoupling, ASi current measurement in the gateway [2]	Diagnostic and configuration interface [3]	Article No.
	POWERLINK, OPC UA	3 x 2-channels	6 release circuits; 6 x electronic safe outputs	ASi-5 + ASi-3 compatible	ASi-3 Safety compatible	openSafety over POWERLINK + Safe Link	2 ASi networks, 2 ASi-5/ASi-3 Masters	yes, max. 4 A/ASi network	Ethernet diagnostics	**BWU3865**

[1] **Number of ASi networks, number of ASi Master**
 "Single Master": 1 ASi network, 1 ASi-5/ASi-3 Master.
 "Doppel Master": 2 ASi networks, 2 ASi-5/ASi-3 Masters.

[2] **Integrated decoupling, ASi current measurement in the gateway**
 "yes, max. 4 A/ASi network": Data decoupling integrated in the gateway. Cost-effective power for 2 ASi networks with 1 power supply (optionally supply of multiple Single Gateways by 1 power supply). Operation with short cable lengths with standard 24 V power supply possible.

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

 The latest version of the device description file of the gateway is available in the "Downloads" section of the respective device.

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Article no.	BWU3865
Fieldbus Interface	
Type	POWERLINK; 2 x RJ45, integrated 2-Port-Hub
Baud rates	10/100 MBaud
Safety communication	openSAFETY
IT interface	–
Card slot	chip card (BW4055) for storage of configuration data
Diagnostics Interface	
Type	Ethernet, RJ-45 acc. to IEEE 802.3
Baud rates	10/100 MBaud half-duplex or full-duplex
Safety communication	Safe Link
IT interface	OPC UA server, web server, REST API
Safe Coupling [(1)]	no
ASi	
ASi specification	ASi-5 + ASi-3
Cycle time	**Cycle time ASi-5 (constant):** 1,27 ms for 384 bits input data + 384 bits output data
	Cycle time ASi-3 (variable): 150 µs * (number of ASi-3 nodes + 2)
ASi Safety	ASi-3 Safety compatible
Operating voltage	30 V (20 … 31.6 V)
Operating current	ca. 300 mA
Current per ASi network	max. 4 A
ASi Power24V capability [(2)]	yes
Length of ASi cable	with 24 V power supply: max. 50 m with 30 V power supply: max. 100 m with ASi-3 / max. 200 m with ASi-5
AUX	
Operating voltage	24 V_{DC} (19,2 ... 28,8 V)
Max current consumption	7,2 A
Display	
LCD	indication of ASi addresses and error messages in plain text
LED power (green)	power on
LED POWERLINK (green)	POWERLINK communication active
LED config error (red)	configuration error
LED U ASi (green)	ASi voltage OK
LED ASi active (green)	ASi 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 voltage source with a PELV/SELV voltage ≤30 V_{DC} must have internal or external current limiting.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.

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Article no.	BWU3865
Ambient	
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
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] Safe data exchange between safe protocols (e.g. CIP Safety, PROFIsafe etc.).
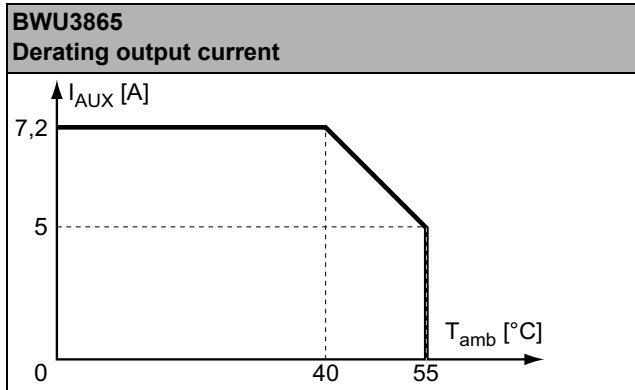
[2] **ASi Power24V**
The device can be operated directly on a 24 V (PELV) power supply. The gateway has been optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use of powerful 24 V power supplies.

Article no.	BWU3865
Safety Monitor	
ASi Safety	ASi-3 Safety compatible
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Antivalent switches for local inputs	yes
Standstill monitors for local inputs	6 axes, up to 50 Hz [1]
Speed monitors for local inputs	3 to 6 axes, up to 400 Hz [2]
Selection of Mode of Safe Operation	yes
Connection	
Connection	Push-in terminals
Length of connector cable	unlimited [3]
Input	
Inputs Safety, SIL3, cat. 4	3 x 2 channels [4]
Inputs digital, EDM	up to 6 standard inputs [4]
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AUX
Output	
Number of release circuits on the monitor	6
Outputs	semiconductor output max. contact load: 1,2 A_{DC-13} at 30 V, ∑= 7,2 A in sum [5]
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

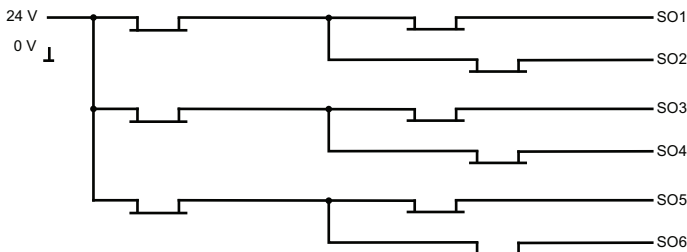[1] connection at all SI or SO terminals possible.

(2) connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU3865")

(3) Loop resistance ≤ 150 Ω

(4) see "Variations of terminal configuration for BWU3865"

(5)

BWU3865
Derating output current

	BWU3865
Integrated decoupling in the Gateway	•
Current measurement of the ASi circuits	•
Self-resetting adjustable fuses	•
ASi earth fault monitor distinguishes between ASi cable and sensor cable	•
Cost-effective power for 2 ASi networks with 1 power supply	•

Safety outputs block diagram BWU3865:

Variations of terminal configuration for BWU3865

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 must be supplied from the same 24V voltage source connected to the supply terminals of the local safe I/Os of the device.

(2) If outputs are configured as inputs, the input current has to be limited by an external element at ≤ 100mA (slow-blow fuse).

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Connections: Gateway + Safety Monitor:

BWU3865	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 ASi circuit
	ASI +PWR-	Power supply for Gateway and ASi networks

Labels in diagram:
- T2 | SI2 | SI4 | SI6
- T1 | SI1 | SI3 | SI5
- Safe inputs / Standard inputs
- SO5 | 24V | 0V | SO6
- SO1 | SO2 | SO3 | SO4
- Safe outputs
- +ASI 1–
- +ASI 1–
- +ASI 2–
- ASI +PWR– (max. 8A)

Accessories:

- **Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)**
- **Chip card, memory capacity 512 kB (art. no. BW4055)**
- **Bihl+Wiedemann Safety Suite - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)**
- **Power supplies, e.g.: 30 V power supply, 4 A, 1 phase (art. no. BW4218), 30 V power supply, 8 A, 1 phase (art. no. BW4219), 30 V power supply, 8 A, 3 phases (art. no. BW4220), 30 V Power Supply, 16 A, 1 phase (art. no. BW4221), 30 V Power Supply, 16 A, 3 phases (art. no. BW4222) (for further power supply units visit** _www.bihl-wiedemann.de/en/products/accessories/power-supplies_**)**

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