ASi-5/ASi-3 EtherCAT Gateway with integrated ASi-5/ASi-3 Safety Monitor, 6SI/6SO

Bihl+Wiedemann

ASi-5 – Great data bandwidth, short cycle times

Compatible with all ASi generations

Safety Monitor supports ASi-5 Safety and ASi-3 Safety

Safe Link

2 ASi-5/ASi-3 Masters, EtherCAT-Device

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

Safe speed and standstill monitoring

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data

(figure similar)

Figure	Interface, field-bus [1]	Safety communi-cation	Inputs Safety [2]	Outputs Safety	ASi-5/ASi-3	ASi Safety	Number of ASi networks, number of ASi Master [3]	Integrated de-coupling, ASi current mea-surement in the gateway [4]	Diagnostic and configuration interface [5]	Art. no.
	EtherCAT, OPC UA	Safe Link	6 x 1 channel or 3 x 2 channels	6 release circuits; 6 x electronic safe outputs	ASi-5 and ASi-3 com-patible	ASi-5 Safety and ASi-3 Safety compati-ble	2 ASi networks, 2 ASi-5/ASi-3 Masters	yes, max. 4 A/ASi network	Ethernet diagnostic	**BWU3964**

[1] **Interface, fieldbus**
Communication interface between fieldbus and gateway: interfaces for standardized fieldbus systems in industrial automation.
EtherCat ASi gateway: interface for an EtherCat fieldbus
OPC UA server: interface for the OPC UA communication

[2] **Inputs Safety**
Safe inputs can be configured as 1-channel or 2-channels depending on the desired application or PL and SIL level.
Suitable for applications up to category 4/PLe/SIL 3.

[3] **Number of ASi networks, number of ASi Master**
"Double Master": 2 ASi networks, 2 ASi-5/ASi-3 Masters.

[4] **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.

[5] **Diagnostic and configuration interface**
"Ethernet diagnostic": Access to ASi master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet dianostics 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.	BWU3964
Fieldbus interface	
Type	EtherCAT; RJ-45 acc. IEEE 802.3
Baud rates	100 MBaud
Safety communication	–
IT interface	–
Card slot	chip card (BW4785) for storage of configuration and additional data
Diagnostic interface	
Type	Ethernet; RJ-45 acc. IEEE 802.3
Baud rate	10/100 MBaud half-duplex or full-duplex
Safety communication	Safe Link
IT interface	OPC UA server, web server, REST API
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-5 Safety and ASi-3 Safety compatible
Operating voltage	30 V_{DC} (20 ... 31,6 V) (PELV voltage)
Operating current	300 mA
ASi Power24V capability [(1)]	yes
AUX	
Operating voltage	24 V_{DC} (19,2 ... 28,8 V)
Max current consumption	7,2 A
Display	
LCD	menu, indication of ASi addresses and error messages in plain text
LED power (green)	power on
LED ect run (green)	EtherCAT communication activ
LED config error (red)	configuration error
LED U ASi (green)	ASi voltage o.k.
LED ASi active (green)	ASi normal operation active
LED prg enable (green)	automatic addresses programming enabled
LED prj mode (yellow)	configuration mode active
LED AUX (green)	ASi power on and auxiliary power on
LEDs SI1 ... SI6 (yellow)	state of inputs: LED off: open LED on: closed
LEDs SO1 ... SO6 (yellow)	state of outputs: LED off: open LED on: closed
UL-specifications (UL508)	
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.

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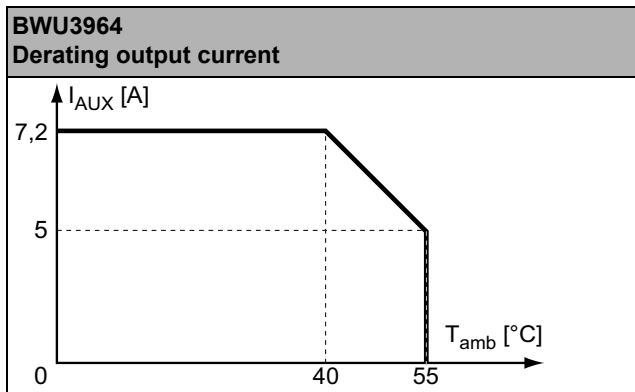| Article no.	BWU3964
Environment	
Standards	EN 62026-2 EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, Performance-Level e EN ISO 13849-2
Operating altitude	2000 m
Ambient temperature	-25 °C … +55 °C (no condensation permitted)
Storage temperature	-25 °C … +85 °C
Housing	stainless steel, for DIN rail mounting
Pollution Degree	2
Protection category	IP20
Tolerable loading referring to humidity	according to EN 61131-2
Maximum tolerable shock and vibration stress	according to EN 61131-2
Voltage of insulation	≥500 V
Weight	800 g
Dimensions (W / H / D in mm)	109 / 120 / 106

[1] **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.	BWU3964
Safety monitor	
ASi Safety	ASi-5 Safety and 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	6 x 1 channel safe inputs (SIL1, cat 2, PLc) or 3 x 2 channels safe input (SIL3, cat. 4, PLe) [4]
Inputs digital, EDM	up to 12 standard inputs [4]
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AUX
Sensor supply	short-circuit and overload protected according to EN 61131-2

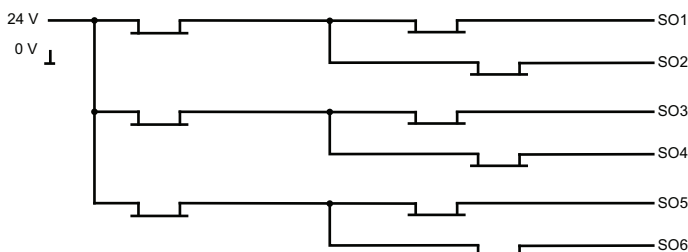| Article no.	BWU3964
Output	
Number of release circuits on the monitor	6 release circuits; 6 x electronic safe outputs [4]
Outputs	semiconductor output
	max. contact load: 1,2 A_{DC-13} at 30 V, $\sum$ = 7,2 A in sum [5]
Power supply (semiconductor outputs)	out of AUX
Output	short-circuit and overload protected according to EN 61131-2
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 BWU3964")

[3] loop resistance ≤150 Ω

[4] see "Variations of terminal configuration for BWU3964"

[5]

BWU3964
Derating output current

	BWU3964
Data decoupling integrated 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 BWU3964:

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Variations of terminal configuration for BWU3964

Terminal	up to 6 safe outputs	up to 6 x 2 channels safe input for floating contacts in combination with T1, T2 [1]	up to 6 x 2 channels safe inputs for antivalent switches [1]	up to 3 x 2 channels safe inputs for OSSDs [1]	up to 12 x 1 channel safe inputs [1]	up to 12 standard inputs [1]
SI1	–	•	•	•	•	•
SI2	–				•	•
SI3	–	•	•	•	•	•
SI4	–				•	•
SI5	–	•	•	•	•	•
SI6	–				•	•
SO1 [2]	•	•	•	–	•	•
SO2 [2]	•			–	•	•
SO3 [2]	•	•	•	–	•	•
SO4 [2]	•			–	•	•
SO5 [2]	•	•	•	–	•	•
SO6 [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 ≤ 100 mA.

Connections: Gateway + Safety Monitor:

BWU3964	Connection	Description
safe inputs/ standard inputs T2 SI2 SI4 SI6 T1 SI1 SI3 SI5 SO5 24V 0V SO6 SO1 SO2 SO3 SO4 safe outputs +ASI 1– +ASI 1– +ASI 2– ASI +PWR– (max. 8A)	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 circuits
	ASI +PWR-	Power supply for Gateway and ASi networks

Accessories:

- **Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)**
- **Chip card for storage of configuration and additional data (art. no. BW4785)**
- **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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