ASi-5/ASi-3 PROFIsafe via PROFINET Gateway with integrated Safety Monitor

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

PROFIsafe and Safe Link in one device

2 ASi-5/ASi-3 Master, PROFINET device
- ASi Safety input nodes report via PROFIsafe
- ASi Safety output nodes switch via PROFIsafe

Up to 64 release circuits
- up to 6 safe output circuits CAT4, SIL 3 on the Monitor
  safe relays or 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 server and
integrated web server for simplified diagnostics

Safe speed and standstill monitoring

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration and additional data

(Figure similar)

Figure	Fieldbus Interface	Safety communication	Inputs Safety, SIL 3, cat. 4	Outputs Safety, SIL 3, cat. 4	ASi-5/ASi-3	ASi Safety	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.
	PROFINET, OPC UA	PROFIsafe (F-CPU) + Safe Link	3 x 2 channels	6 release circuits; 6 x electronic safe outputs	ASi-5 and ASi-3 compatible	ASi-5 Safety and ASi-3 Safety compatible	2 ASi networks, 2 ASi-5/ASi-3 masters	yes, max. 4 A/ ASi network	Ethernet fieldbus; Ethernet diagnostics	BWU3953

[1] **Number of ASi networks, number of ASi Master**
"Single Master": 1 ASi network, 1 ASi-3 Master.
"Double Master": 2 ASi networks, 2 ASi-3 Masters.
"Optional ASi Safety coupling circuit": 2 ASi networks, 1 ASi-3 Master.

[2] **Integrated decoupling, ASi current measurement in the gateway**
"yes, max. 4A/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 fieldbus + Ethernet diagnostic": Access to ASi master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet diagnostics interface or Ethernet fieldbus interface.
The latest version of the device description file of the gateway with integrated safety monitor is available in the "Downloads" section of the respective device.

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Article no.	BWU3953
Fieldbus Interface	
Type	PROFINET Conformance Class B. integrated switch complies with Conformance Class C (IRT capability) 2 x RJ-45,integrated 2-Port-Switch IRT capability
Baud rates	10/100 MBaud
Safety communication	PROFIsafe via PROFINET + Safe Link
OPC UA interface	OPC UA server + web server
Function	PROFINET IO Device Media Redundancy Protocol (MRP) Shared Device
Card slot	chip card (BW4785) for storage of configuration and additional data
Ethernet interface	
Type	Ethernet; RJ-45 according IEEE 802.3
Baud rate	10/100 MBaud half-duplex or full-duplex
Safety communication	Safe Link
OPC UA interface	OPC UA server + web server
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	indication of ASi addresses and error messages in plain text
LED PROFINET (green / red)	green: PROFINET communication active red: no PROFINET communication
LED power (green)	power on
LED config error (red)	configuration error
LED U ASi (green)	ASi voltage OK
LED ASi active (green)	ASi normal operation active
LED prg enable (green)	automatic address 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: off: open on: close
LEDs SO1 ... SO6 (yellow)	state of outputs: off: open on: close
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.

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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| Article no.	BWU3953
Environment	
Applied standards	EN 62026-2 EN 60529 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 61326-3-1 EN 50581 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, Performance-Level e EN ISO 13849-2
Operating altitude	max. 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
Maximum tolerable shock and vibration stress	according EN 61131-2
Tolerable loading reffering to humidity	according 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.	BWU3953
Safety monitor	
ASi Safety	ASi-5 Safety and ASi-3 Safety compatible
Start delay	< 10 s
Max. turn-off time	< 40 s
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	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

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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Article no.	BWU3953
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 [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 BWU3953")

[3]   loop resistance ≤ 150 Ω

[4]   see "Variations of terminal configuration for BWU3953"

[5]

BWU3953
Derating output current
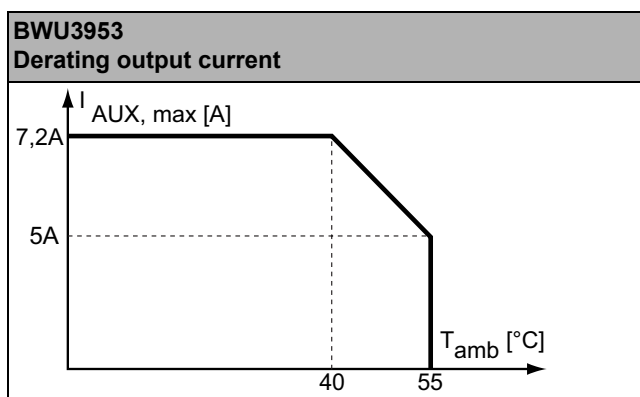
	BWU3953
Data decoupling integrated in the gateway	•
Redundant power supply out of ASi: all fundamental functions of the device remain available even in case of power failure in one of the two ASi networks	–
Current measurement of the ASi circuits	•
Self-resetting adjustable fuses	•
ASi earth fault monitor distinguishes between ASi cable and sensor cable	•
Cost-effective power for 2 ASi networks with 1 power supply	•

Safety outputs block diagram BWU3953

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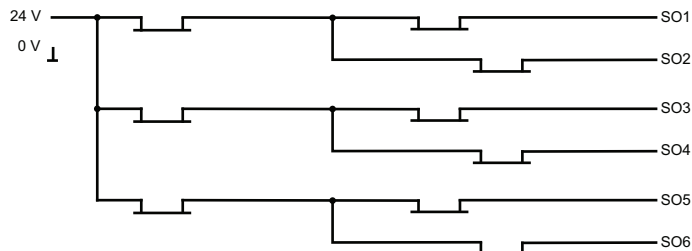
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Variations of terminal configuration for BWU3953

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 24 V 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

Connections: Gateway + Safety Monitor:

BWU3953	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
	24V, 0V	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, memory capacity ≥16 GB (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*)**
- **PROFINET Master Simulators Licenses (art. no. BW4754, BW4755)**

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