

ASi-5/ASi-3 EtherNet/IP + Modbus TCP-Gateway with integrated Safety Monitor



ASi-5 – Great data bandwidth, short cycle times

Compatible with all ASi generations

2 ASi-5/ASi-3 masters, EtherNet/IP ⁽¹⁾ + Modbus TCP device

- switch integrated

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



(figure similar)

Safe Link

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 data



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Figure	Fieldbus Interface ⁽¹⁾	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 ⁽²⁾	Integrated decoupling, ASi current measurement in the gateway ⁽³⁾	Diagnostic and configuration interface ⁽⁴⁾	Article No.
	EtherNet/IP + ModbusTCP, OPC UA	Safe Link	6 x 1 channel or 3 x 2 channels	6 release circuits; 6 x electronic safe outputs	ASi-5 + ASi-3 compatible	ASi-5 Safety + ASi-3 Safety compatible	2 ASi networks, 2 ASi-5/ASi-3 masters	yes, max. 8A/ASi network	Ethernet fieldbus; Ethernet diagnostics	BWU4244

(1) **Fieldbus interface**

Communication interface between fieldbus and gateway: interfaces for standardized fieldbus systems in industrial automation.

EtherNet/IP + ModbusTCP ASi gateway: interface for a EtherNet/IP + Modbus TCP fieldbus

OPC UA server: interface for the OPC UA communication.

(2) **Number of ASi networks, number of ASi Master**

"Double Master": 2 ASi networks, 2 ASi-5/ASi-3 Masters.

(3) **Integrated decoupling, ASi current measurement in the gateway**

"yes, max. 8 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.

(4) **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.

ASi-5/ASi-3 EtherNet/IP + Modbus TCP- Gateway with integrated Safety Monitor

Article no.	BWU4244
Fieldbus interface	
Type	EtherNet/IP + Modbus TCP acc. to IEEE 802.3 2 x RJ-45, integrated 2-Port-Switch
Transmission rate	10/100 MBit/s
IT interface	OPC UA server, web server, REST API
Safety communication	Safe Link
Variably configurable Assembly Objects	yes
Function	Device Level Ring (DLR) (Ethernet/IP only)
Card slot	chip card (BW4785) for storage of configuration and additional data
Diagnostic interface	
Type	Ethernet; RJ-45 acc. to IEEE 802.3
Transmission rate	10/100 MBit/s
OPC UA interface	OPC UA server, web server, REST API
Safety communication	Safe Link
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)
Operating voltage	30 V _{DC} (20 ... 31,6 V) (PELV voltage)
Operating current	max. 350 mA
Current per ASi network	max. 8 A
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 net (green)	Ethernet network active
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 (UL61010)	
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.

ASi-5/ASi-3 EtherNet/IP + Modbus TCP-Gateway with integrated Safety Monitor

Article no.	BWU4244
Environment	
Applied standards	EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PLe
Operating altitude	2000 m
Ambient temperature	-25 °C ... +50 °C (up to max. 55 °C) ⁽²⁾ (no condensation permitted)
Storage temperature	-25 °C ... +85 °C
Intended environment	for indoor use only
Housing	stainless steel, for DIN rail mounting
Pollution Degree	2
Overvoltage category	III
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	860 g
Dimensions (W / H / D in mm)	111 / 126 / 148

(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.

(2) Maximum ambient operating temperature +50 °C according UL certificate for the use in the USA and Canada.

Article no.	BWU4244
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, SIL3, cat. 4	up to 6 x 1 channel safe inputs (SIL1, Cat. 2, PLc) or up to 3 x 2 channel safe inputs (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

ASi-5/ASi-3 EtherNet/IP + Modbus TCP- Gateway with integrated Safety Monitor

Article no.	BWU4244
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, $\Sigma = 7,2$ 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.

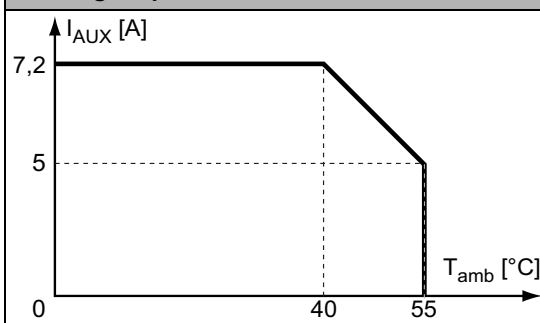
(2) connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU4244")

(3) loop resistance $\leq 150 \Omega$

(4) see "Variations of terminal configuration for BWU4244"

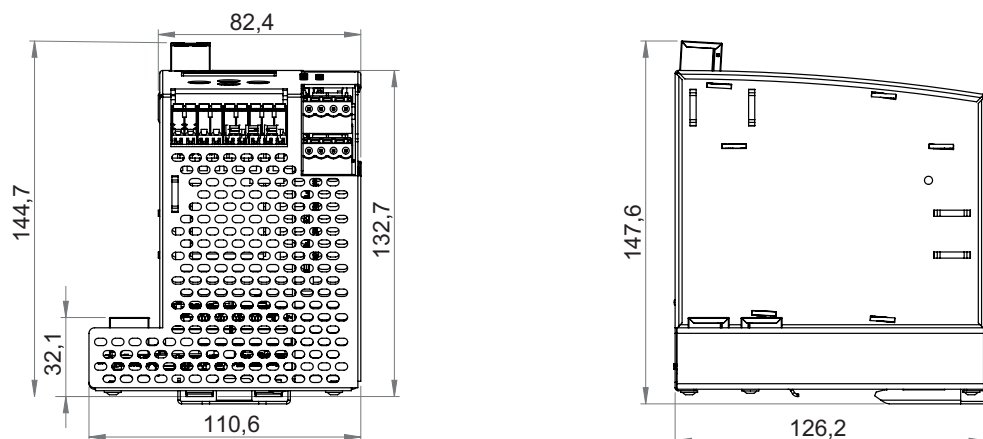
(5)

BWU4244
Derating output current



Dimensional drawings

BWU4244



ASi-5/ASi-3 EtherNet/IP + Modbus TCP-Gateway with integrated Safety Monitor

Wiring rules ASi connection + local I/Os

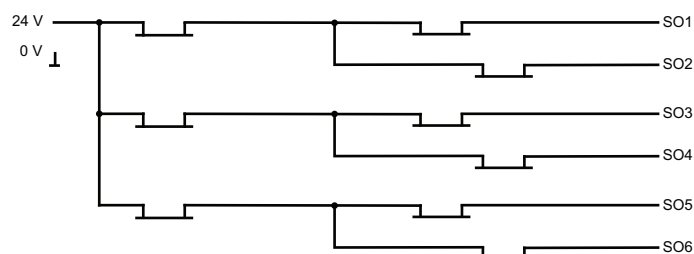
	Push-in terminals, 2 /3 /4 poles (pitch 5 mm)
General	
Nominal cross section	2.5 mm ²
Conductor cross section	
Conductor cross section solid	0.2 ... 2.5 mm ²
Conductor cross section flexible	0.2 ... 2.5 mm ²
Conductor cross section flexible, with ferrule	without plastic sleeve: 0.25 ... 2.5 mm ²
	with plastic sleeve: 0.25 ... 2.5 mm ²
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0.5 ... 1.5 mm ²
AWG	24 ... 14
Stripped insulation length	10 mm

Wiring rules power supply

	Push-in terminals, 3 poles (pitch 7.62 mm)
General	
Nominal cross section	2.5 mm ²
Conductor cross section	
Conductor cross section solid	0.5 ... 1.5 mm ²
Conductor cross section flexible	0.5 ... 2.5 mm ² (with or without plastic sleeve)
AWG	20 ... 12
Stripped insulation length	10 mm

	BWU4244
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 BWU4244:



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Variations of terminal configuration for BWU4244

Terminal	up to 6 safe outputs	up to 6 safe 2 channel inputs for floating contacts in combination with T1, T2 ⁽¹⁾	up to 6 safe 2 channel inputs for antivalent switches ⁽¹⁾	up to 3 safe 2 channel inputs for OSSDs	up to 12 safe 1 channel 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 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 $\leq 100\text{mA}$

Connections: Gateway + Safety Monitor:

BWU4244	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 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, 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)