

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

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2 ASi-3 Master, EtherNet/IP + Modbus TCP-Device ⁽¹⁾

- switch integrated

Up to 64 release circuits

- up to 6 release circuits SIL 3, cat. 4 on the Monitor, relays or electronic safe outputs

Safe ASi outputs are supported

- up to 32 independent ASi outputs
Multiple safe ASi outputs possible via a single ASi address



(figure similar)

optionally with OPC UA server and
integrated web server for simplified diagnostics

Significantly improved response times


Safe speed and standstill monitoring

Applications up to category 4/PLe/SIL 3

Chip card for storage of configuration data



⁽¹⁾ Modbus TCP from Ident.no.: 13076 (see lateral label).

Figure	Fieldbus Interface ⁽¹⁾	Safety communication	Inputs Safety, SIL 3, Cat. 4	Outputs Safety, SIL 3, cat. 4	Inputs Safety, expandable to	Safety outputs, independent according to SIL 3, expandable to	Number of ASi networks, number of ASi Master ⁽²⁾	Integrated decoupling, ASi current measurement in the gateway ⁽³⁾	Diagnostic and configuration interface ⁽⁴⁾	Art. no.
	EtherNet/IP + Modbus TCP	Safe Link	3 x 2 channels	6 release circuits; 6 x electronic safe outputs	max. 62 x 2 channels, max. 1922 in max. configuration	max. 32, max. 992 in max. configuration	2 ASi networks, 2 ASi-3 Masters	no, max. 8A/ASi network, redundant supply	Ethernet fieldbus, Ethernet diagnostic	BWU3544

⁽¹⁾ **Fieldbus interface**

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

EtherNet/IP+ Modbus TCP ASi gateway: interface for an EtherNet/IP+ ModbusTCP 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-3 Masters.

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

"no, max. 8 A/ASi network, redundant supply": 1 power supply per ASi network. Gateway is powered in normal operation from one of the two ASi power supplies. Should one ASi power supply fail, switching to the other ASi power supply allows all the diagnostics functions to be maintained and the unaffected ASi network continues to operate.

⁽⁴⁾ **Diagnostic and configuration interface**

"Ethernet fieldbus + Ethernet diagnostic": Access to ASi Master and Safety Monitor with Bihl+Wiedemann software by using the Ethernet diagnostic interface or Ethernet fieldbus 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.	BWU3544
Fieldbus interface	
Type	Ethernet + Modbus TCP acc. to IEEE 802.3 2 x RJ-45, integrated 2-Port-Switch,
Baud rate	10/100 MBaud
Variably configurable Assembly Objects	yes
OPC UA interface	–
Function	Device Level Ring (DLR) (Ethernet/IP only)
Card slot	chip card (128 KB) for storage of configuration data
Diagnostic interface	
Type	Ethernet; RJ-45 acc. to IEEE 802.3
Baud rate	10/100 MBaud half-duplex or full-duplex ⁽³⁾
Safety communication	Safe Link
Safe coupling ⁽¹⁾	–
ASi	
ASi specification	3.0
Cycle time	150 μ s * (number of ASi-3 nodes + 2)
Operating voltage	30 V _{DC} (20 ... 31,6 V) (PELV voltage)
Operating current	max. 370 mA
ASi Power24V capability ⁽²⁾	no
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 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)	auxiliary power
LEDs 1.Y1, 1.Y2, 2.Y1, 2.Y2 (EDM/Start) (yellow)	–
LEDs K1 ... K4 (green)	–
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)	
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.

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Article no.	BWU3544
Environment	
Standards	EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PL _e
Operating altitude	max. 2000 m
Ambient temperature	0 °C ... +55 °C
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) 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.

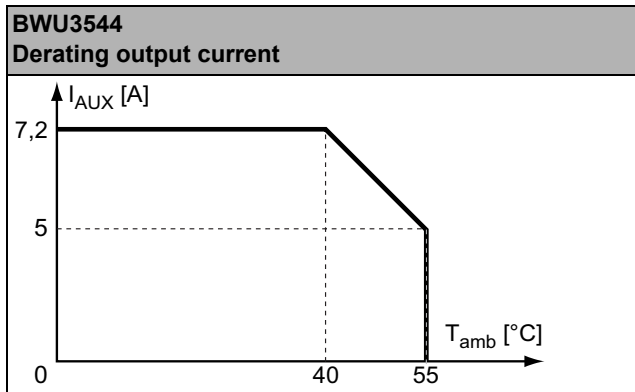
(3) BWU3544 from Ident. No. ≥16798, Ident. No. <16798 10 Mbaud half-duplex.

Article no.	BWU3544
Safety monitor	
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⁾
Connection	
Connection	COMBICON
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
Sensor supply	short-circuit and overload protected according to EN 61131-2

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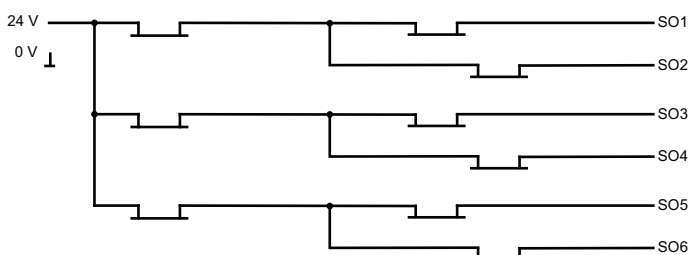
Article no.	BWU3544
Output	
Number of release circuits on the monitor	6
Outputs	– semiconductor output max. contact load: 1,2 A _{DC-13} at 30 V, $\Sigma = 7,2$ A in sum ⁽⁵⁾
Power supply (semiconductor outputs)	out of AUX
Output	short-circuit and overload protected according to EN 61131-2
Test pulse (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 BWU3544")
 (3) loop resistance $\leq 150 \Omega$
 (4) see "Variations of terminal configuration for BWU3544"
 (5)



	BWU3544
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 BWU3544:



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Variations of terminal configuration for BWU3544

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 ≤ 100 mA.

Connections: Gateway + Safety Monitor:

BWU3544	Connection	Description
<p>The diagram shows the terminal block layout for the BWU3544. It is divided into two main sections: 'safe inputs/standard inputs' and 'safe outputs'. The top section contains terminals T1, T2, SI1, SI2, SI3, SI4, SI5, and SI6. The bottom section contains terminals SO1, SO2, SO3, SO4, SO5, 24V, 0V, and SO6. Below the terminal block, there are four yellow labels for ASi connections: +ASi1-, ASi1 +PWR- (max. 8A), +ASi2-, and ASi2 +PWR- (max. 8A).</p>	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
	ASi1 +PWR-, ASi2 +PWR-	Power supply for Gateway and ASi networks

Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- Chip card, memory capacity 128 KB (art. no. BW2222)
- Bihl+Wiedemann Suite - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)
- Power supplies, e.g.: ASi power supply, 4 A (art. no. BW1649), ASi power supply, 8 A (art. no. BW1997)
(further power supply units can be found at www.bihl-wiedemann.de/en/products/accessories/power-supplies)