

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

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New standard ASi-5

ASi-5 master and ASi-3 master in one device

1 ASi-5/ASi-3 Master, EtherNet/IP + Modbus TCP device

- switch integrated

Up to 64 release circuits

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

Safe ASi outputs are supported

- up to 31 independent ASi outputs  
Multiple safe ASi outputs possible via a single ASi address

OPC UA server and integrated web server for simplified diagnostics

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	Fieldbus Interface <sup>(1)</sup>	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 <sup>(2)</sup>	Integrated decoupling, ASi current measurement in the gateway <sup>(3)</sup>	Diagnostic and configuration interface <sup>(4)</sup>	Art. no.
	EtherNet/IP + Modbus TCP, OPC UA	Safe Link	3 x 2 channels	6 release circuits; 6 x fast electronic safe outputs	max. 31 x 2 channels, max. 1891 in max. configuration	max. 31, max. 991 in max. configuration	1 ASi network, 1 ASi-5/ASi-3 master	yes, max. 4 A/ASi network	Ethernet fieldbus, Ethernet diagnostic	BWU3866

**(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**

**"Single Master":** 1 ASi network, 1 ASi-5/ASi-3 Master.

**(3) 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.

**(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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<b>Article no.</b>	<b>BWU3866</b>
<b>Fieldbus interface</b>	
Type	EtherNet + Modbus TCP acc. to IEEE 802.3 2 x RJ-45, integrated 2-Port-Switch
Baud rate	10/100 MBaud
OPC UA interface	OPC UA server + web server
Safety communication	Safe Link
Variably configurable Assembly Objects	yes
Function	Device Level Ring (DLR) (EtherNet/IP only)
Card slot	chip card (BW4055) for storage of configuration data
<b>Diagnostic interface</b>	
Type	Ethernet; RJ-45 acc. to IEEE 802.3
Baud rate	10/100 MBaud half-duplex or full-duplex
OPC UA interface	OPC UA server + web server
Safety communication	Safe Link
<b>ASi</b>	
ASi specification	ASi-5 + ASi-3
Cycle time	<b>Cycle time ASi-5 (constant):</b> 1,27 ms for 384 bits input data + 384 bits output data
	<b>Cycle time ASi-3 (variable):</b> 150 $\mu$ s * (number of ASi-3 nodes + 2)
Operating voltage	30 V <sub>DC</sub> (20 ... 31,6 V) (PELV voltage)
Operating current	300 mA
ASi Power24V capability <sup>(1)</sup>	yes
<b>AUX</b>	
Operating voltage	24 V <sub>DC</sub> (19,2 ... 28,8 V)
Max current consumption	7,2 A
<b>Display</b>	
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 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: LED off: open LED on: closed
LEDs SO1 ... SO6 (yellow)	state of outputs: LED off: open LED on: closed
<b>UL-specifications (UL508)</b>	
External protection	An isolated voltage source with a PELV/SELV voltage $\leq 30$ V <sub>DC</sub> 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.

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

<b>Article no.</b>	<b>BWU3866</b>
<b>Environment</b>	
Applied standards	EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PL <sub>e</sub>
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.

<b>Article no.</b>	<b>BWU3866</b>
<b>Safety monitor</b>	
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 <sup>(1)</sup>
Speed monitors for local inputs	3 to 6 axes, up to 400 Hz <sup>(2)</sup>
<b>Connection</b>	
Connection	Push-in terminals
Length of connector cable	unlimited <sup>(3)</sup>
<b>Input</b>	
Inputs Safety, SIL3, cat. 4	3 x 2 channels <sup>(4)</sup>
Inputs digital, EDM	up to 6 standard inputs <sup>(4)</sup>
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
<b>Output</b>	
Number of release circuits on the monitor	6
Outputs	– semiconductor output max. contact load: 1,2 A <sub>DC-13</sub> at 30 V, Σ = 7,2 A in sum <sup>(5)</sup>
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

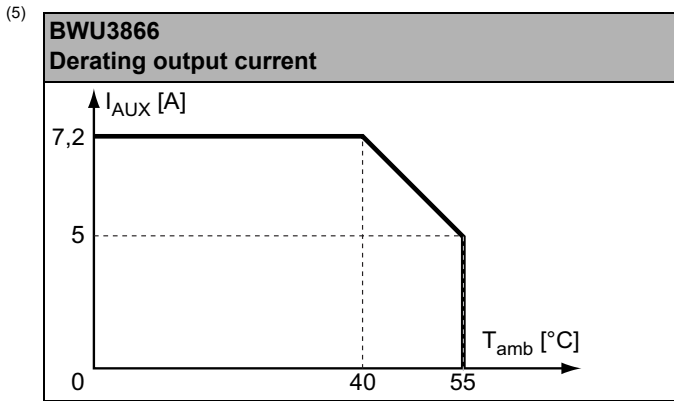
(1) connection at all SI or SO terminals possible.

(2) connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU3866")

(3) loop resistance ≤150 Ω

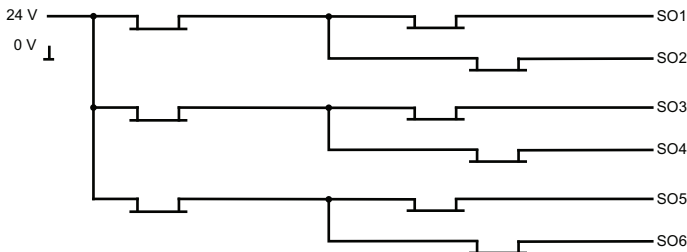
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(4) see "Variations of terminal configuration for BWU3866"



	BWU3866
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 BWU3866:



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## Variations of terminal configuration for BWU3866

Terminal	Safe output	Safe input for mechanical contacts in combination with T1, T2 <sup>(1)</sup>	Safe antivalent input <sup>(1)</sup>	Safe electronic input <sup>(1)</sup>	Standard input <sup>(1)</sup>
SI1,2	–	•	•	•	•
SI3,4	–	•	•	•	•
SI5,6	–	•	•	•	•
SO1,2 <sup>(2)</sup>	•	•	•	–	•
SO3,4 <sup>(2)</sup>	•	•	•	–	•
SO5,6 <sup>(2)</sup>	•	•	•	–	•

(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:

BWU3866	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-	Connection of ASi circuit
	ASI +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 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](http://www.bihl-wiedemann.de/en/products/accessories/power-supplies))