

# ASi-3 PROFINET Gateways with integrated Safety Monitor

## ASi-3 PROFINET Gateways with integrated Safety Monitor

2 / 1 ASi-3 Master, PROFINET device

Up to 32 release circuits

- up to 6 safe output circuits on the Monitor safe 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

1 Safety Monitor for 2 ASi networks

- Operation using a single Monitor configuration!  
Monitor processes safety nodes on two ASi networks
- Coupling between the two networks superfluous

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	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 (1)	Integrated decoupling, ASi current measurement in the gateway (2)	Diagnostic and configuration interface (3)	Article No.
	PROFINET	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	yes, max. 4 A/ASi network	Ethernet fieldbus; Ethernet diagnostics	<b>BWU2828</b>
	PROFINET	Safe Link	3 x 2 channels	6 release circuits; 6 x 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-3 Master	yes, max. 4 A/ASi network	Ethernet fieldbus; Ethernet diagnostics	<b>BWU2798</b>
	PROFINET	Safe Link	—	4 release circuits; 2 x relay, 2 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	yes, max. 4 A/ASi network	Ethernet fieldbus; RS 232	<b>BWU2642</b>

(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.

(2) **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.

"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.

# ASi-3 PROFINET Gateways with integrated Safety Monitor

### (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.

**"Ethernet fieldbus + RS 232"**: Access to ASi master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet fieldbus interface or RS 232 interface and adapter cable.

The latest version of the device description file of the gateway is available in the "Downloads" section of the respective device.

Article no.	BWU2642	BWU2798 / BWU2828
<b>Fieldbus Interface</b>		
Type	PROFINET; 2 x RJ-45, integrated 2-Port-Switch, IRT capability	
Conformance Class	Class B integrated switch complies with Class C (IRT capability)	
Baud rates	10/100 Mbaud	
Function	PROFINET IO Device Media Redundancy Protocol (MRP) Shared Device	
Card slot	Chip card for storage of configuration data	
<b>Diagnostic Interface</b>		
Type	Ethernet; RJ-45 acc. to IEEE 802.3	
<b>ASi</b>		
ASi specification	3.0	
Cycle time	150 $\mu$ s * (number of nodes + 2)	
Operating voltage	30 V <sub>DC</sub> (20 ... 31,6 V) (PELV voltage)	
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	1 A	7,2 A
<b>Display</b>		
LCD	indication of ASi addresses and error messages in plain text	
LED power (green)	power on	
LED PROFINET (green/red)	green: PROFINET communication active red: no PROFINET communication	
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 addresses programming enabled	
LED prj mode (yellow)	configuration mode active	
LED AUX (yellow)	auxiliary power	
LEDs 1.Y1, 1.Y2, 2.Y1, 2.Y2 (EDM/Start) (yellow)	state of inputs: off: open on: closed	–
LEDs K1 ... K4 (green)	state of outputs: off: open on: closed	–
LEDs SI1 ... SI6 (yellow)	–	state of inputs: off: open on: closed
LEDs SO1 ... SO6 (yellow)	–	state of outputs: off: open on: closed

# ASi-3 PROFINET Gateways with integrated Safety Monitor

Article no.	BWU2642	BWU2798 / BWU2828
<b>UL-specifications (UL508)</b>		
External protection	An isolated source with a secondary open circuit voltage of $\leq 30 V_{DC}$ has to be protected with a 3 A maximum over current. 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.	
cTÜVus	the device BWU2642 from Bihl+Wiedemann GmbH is safety certified by TÜV Rheinland of North America, Inc. according to UL-standards and meets the safety requirements for the North American market.	
<b>Ambient</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, Performance-Level e	
Ambient temperature	0 °C ... +55 °C	
Storage temperature	-25 °C ... +85 °C	
Operating altitude	max. 2000 m	
Housing	stainless steel, for DIN-rail mounting	
Protection category	IP20	
Tolerable loading referring to impacts and vibrations	according EN 61131-2	
Voltage of insulation	$\geq 500 V$	
Weight	800 g	
Dimensions (W / H / D in mm)	109 / 120 / 96	109 / 120 / 106

**(1) ASi Power24V**

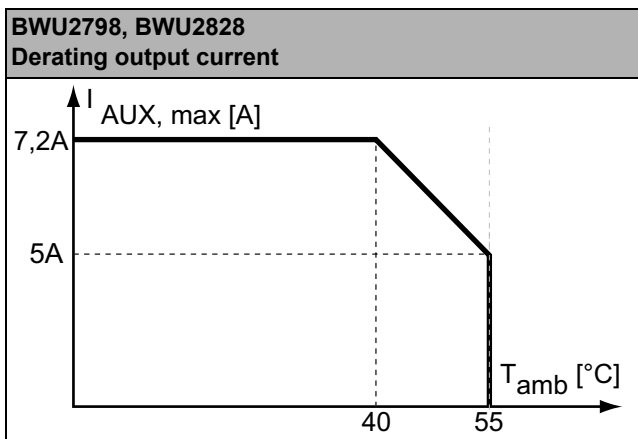
The device can be operated directly on a 24 V (PELV) power supply. The gateway has been optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use of powerful 24 V power supplies.

Article no.	BWU2642	BWU2798 / BWU2828
<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>(2)</sup>
Speed monitors for local inputs	–	3 to 6 axes up to 400 Hz <sup>(3)</sup>
<b>Connection</b>		
Connection	COMBICON	
Length of connector cable	I/O: max. 15 m	unlimited <sup>(4)</sup>
<b>Input</b>		
Inputs Safety, SIL3, cat. 4	–	3 x 2 channels <sup>(5)</sup>
Inputs digital, EDM	4	up to 6 standard inputs <sup>(5)</sup>
Switching current	30 mA (T = 100 $\mu$ s), continuously 4 mA at 24 V	15 mA (T = 100 $\mu$ s), continuously 4 mA at 24 V
Power supply	out of ASi	out of AUX

# ASi-3 PROFINET Gateways with integrated Safety Monitor

Article no.	BWU2642	BWU2798 / BWU2828
<b>Output</b>		
Number of release circuits on the monitor	4	6
Outputs	relay outputs (output circuits 1 and 2) max. contact load <sup>(1)</sup> : 3 AAC-15 at 30 V, 3 ADC-13 at 30 V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5 ADC-13 at 30 V	semiconductor output max. contact load: 1,2 A <sub>DC-13</sub> at 30 V, $\Sigma = 7,2$ A in sum <sup>(6)</sup>
Power supply (semiconductor outputs)	out of AUX	
Test pulse (semiconductor outputs)	if output is on: minimum interval between 2 test pulses: 250 ms (as from Safety Version 4.3); maximum pulse width 1,5 ms	if output is on: minimum interval between 2 test pulses: 250 ms; maximum pulse width 1 ms

- (1) Protection via external fuse, max. 4 A semi time-lag.
- (2) connection at all SI or SO terminals possible.
- (3) connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU2798, BWU2828")
- (4) loop resistance  $\leq 150 \Omega$
- (5) see "Variations of terminal configuration for BWU2798, BWU2828"
- (6)

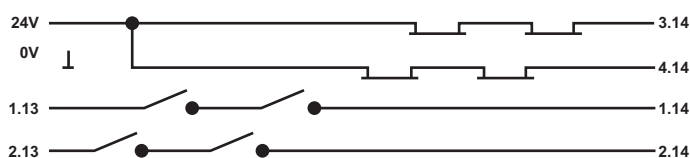


Article no.	Operating current		
	Master power supply, ca. 300 mA out of ASi circuits	Master power supply, max. 300 mA out of ASi circuit 1 (approx. 70 mA ... 300 mA), max. 300 mA out of ASi circuit 2 (approx. 70 mA ... 300 mA); in sum max. 370 mA	Cost-effective power for 2 ASi networks with 1 power supply, approx. 300 mA (PELV voltage)
BWU2642	-	-	•
BWU2798	-	-	•
BWU2828	-	-	•

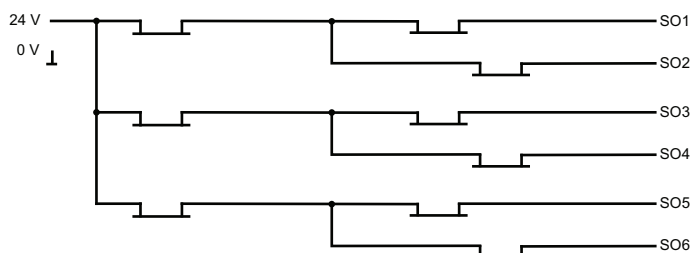
# ASi-3 PROFINET Gateways with integrated Safety Monitor

	BWU2642 / BWU2798 / BWU2828
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 BWU2642



## Safety outputs block diagram BWU2798, BWU2828



## Variations of terminal configuration for BWU2798, BWU2828

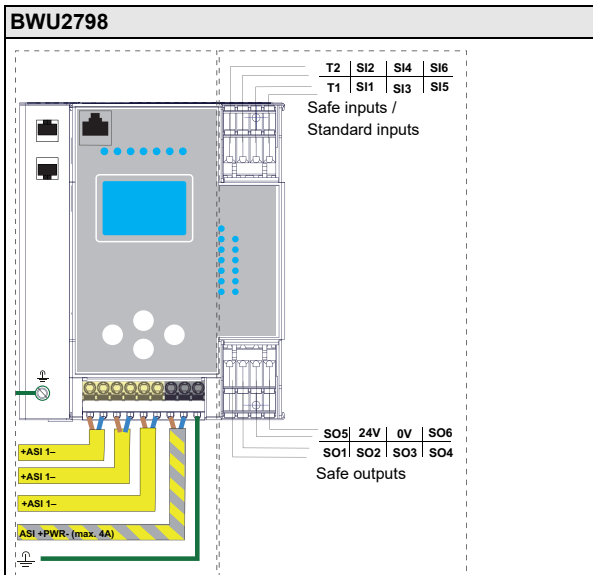
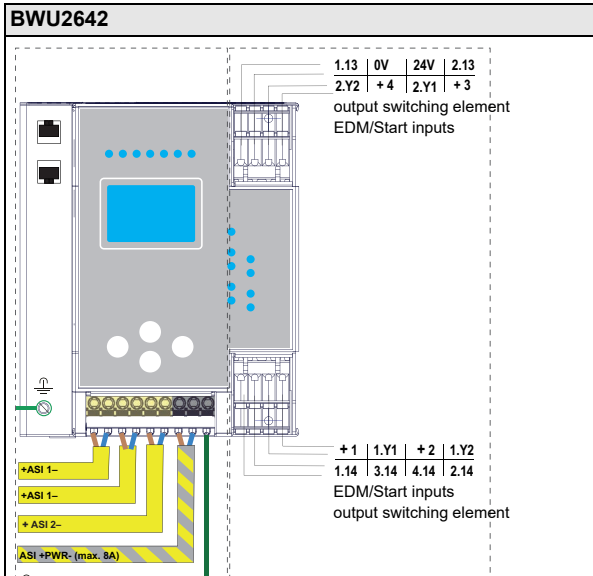
Terminal	Safe output	Safe input for mechanical contacts in combination with T1, T2 <sup>(1)</sup>	Safe antivalent input <sup>(1)</sup>	Safe electronic input <sup>(1)</sup>	Standard input <sup>(1)</sup>
SI1,2	–	•	•	•	•
SI3,4	–	•	•	•	•
SI5,6	–	•	•	•	•
SO1,2 <sup>(2)</sup>	•	•	•	–	•
SO3,4 <sup>(2)</sup>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

<sup>(1)</sup> Inputs must be supplied from the same 24V voltage source connected to the supply terminals of the local safe I/Os of the device.

<sup>(2)</sup> If outputs are configured as inputs, the input current has to be limited by an external element at ≤100 mA

# ASi-3 PROFINET Gateways with integrated Safety Monitor

## Connections: Gateway + Safety Monitor:



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

# ASi-3 PROFINET Gateways with integrated Safety Monitor

BWU2828	Connection	Description	
<p>The diagram shows the terminal block of the BWU2828 gateway. It is divided into several sections:         <ul style="list-style-type: none"> <li><b>Safe inputs / Standard inputs:</b> A top section with terminals labeled T1, T2, SI1, SI2, SI3, SI4, SI5, and SI6.</li> <li><b>Safe outputs:</b> A middle section with terminals labeled SO1, SO2, SO3, SO4, SO5, SO6, 24V, and 0V.</li> <li><b>ASi connections:</b> A bottom section with terminals labeled +ASI 1-, +ASI 1+, +ASI 2-, and ASI +PWR- (max. 8A).</li> </ul> </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 circuits	
	ASI +PWR-	Power supply for Gateway and ASi networks	

## Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- PROFINET Master Simulator (art. no. BW3057)
- Bihl+Wiedemann 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))