

# ASi-3 PROFINET Gateways with integrated Safety Monitor

## ASi-3 PROFINET Gateways with integrated Safety Monitor

2 / 1 Master, PROFINET Slave

Up to 32 release circuits

- up to 6 safe output circuits on the Monitor  
safe relays or fast 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 slaves 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	Type	Inputs safety, expandable to	Outputs Safety, SIL 3, cat. 4	Safety outputs, independent according to SIL 3, expandable to	Safety communication	Number of ASi networks, number of ASi Master <sup>(1)</sup>	1 power supply, 1 gateway for 2 ASi networks, inexpensive power supplies <sup>(2)</sup>	Diagnostic and configuration interface <sup>(3)</sup>	Article No.
	Safety, PROFINET	max. 62 x 2 channels, max. 1922 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 32, max. 992 in max. configuration	Safe Link	2 ASi networks, 2 ASi Masters	yes, max. 4 A/ ASi network	Ethernet fieldbus; Ethernet diagnostics	<b>BWU2828</b>
	Safety, PROFINET	max. 62 x 2 channels, max. 1922 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 32, max. 992 in max. configuration	Safe Link	2 ASi networks, 2 ASi Masters	no, max. 8 A/ ASi network, redundant supply	Ethernet fieldbus; Ethernet diagnostics	<b>BWU3080</b>
	Safety, PROFINET	max. 31 x 2 channels, max. 1891 in max. configuration	6 release circuits; 6 x fast electronic safe outputs	max. 31, max. 991 in max. configuration	Safe Link	1 ASi network, 1 ASi Master	yes, max. 4 A/ ASi network	Ethernet fieldbus; Ethernet diagnostics	<b>BWU2798</b>
	Safety, PROFINET	max. 62 x 2 channels, max. 1922 in max. configuration	4 release circuits; 2 x relay, 2 x fast electronic safe outputs	max. 32, max. 992 in max. configuration	Safe Link	2 ASi networks, 2 ASi Masters	yes, max. 4 A/ ASi network	Ethernet fieldbus + RS 232	<b>BWU2642</b>

<sup>(1)</sup> **Number of ASi networks, number of ASi Master**

"Single Master": 1 ASi network, 1 ASi Master.

"Double Master": 2 ASi networks, 2 ASi Masters.

<sup>(2)</sup> **1 power supply, 1 gateway for 2 ASi networks, inexpensive power supplies**

"yes, max. 4 A/ASi network": Cost-effective power for 2 ASi networks with 1 power supply (optionally supply of multiple Single Gateways by 1 power supply).

"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.

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### (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	BWU3080
<b>Interface</b>			
PROFINET interface	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>ASi</b>			
ASi specification	3.0		
Cycle time	150 $\mu$ s * (number of slaves + 2)		
Operating voltage	30 V <sub>DC</sub> (20 ... 31,6 V) (PELV voltage)		
ASi Power24V capability <sup>(1)</sup>	yes		no
<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 slave 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

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Article no.	BWU2642	BWU2798 / BWU2828	BWU3080
<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.		
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		
<b>Ambient</b>			
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**

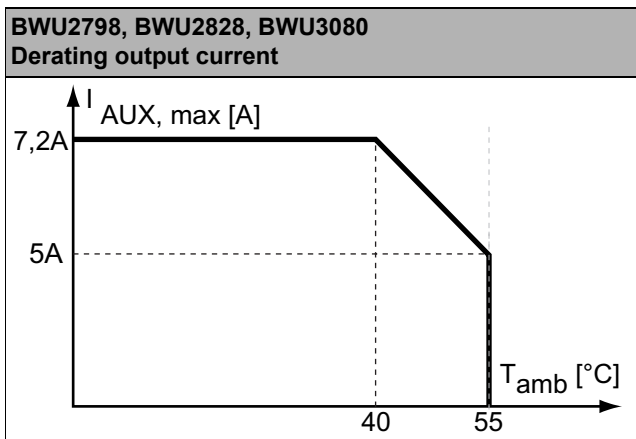
The device can be operated directly on a 24 V (PELV) power supply. The gateway has been optimized with integrated data coupling coils and adjustable self-resetting fuses for safe use of powerful 24 V power supplies.

Article no.	BWU2642	BWU2798 / BWU2828 / BWU3080
<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 / BWU3080
<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 A <sub>AC-15</sub> at 30 V, 3 A <sub>DC-13</sub> at 30 V semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5 A <sub>DC-13</sub> 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, BWU3080")
- (4) loop resistance  $\leq 150 \Omega$
- (5) see "Variations of terminal configuration for BWU2798, BWU2828, BWU3080"
- (6)



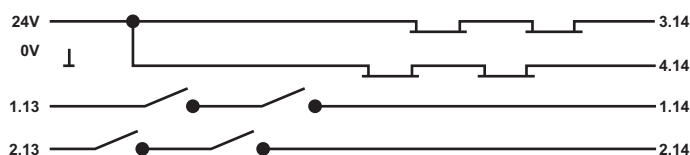
Article no.	Operating current		
	Master power supply, ca. 300 mA out of ASi circuits	Master power supply, max. 300 mA out of ASi circuit 1 (approx. 70 mA ... 300 mA), max. 300 mA out of ASi circuit 2 (approx. 70 mA ... 300 mA); in sum max. 370 mA	Version „1 gateway, 1 power supply, for 2 ASi networks“, approx. 300 mA (PELV voltage)
BWU2642	-	-	•
BWU2798	-	-	•
BWU2828	-	-	•
BWU3080	-	•	-

# ASi-3 PROFINET Gateways with integrated Safety Monitor

	BWU3080	BWU2642 / BWU2798 / BWU2828
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	–	•
In version „1 gateway, 1 power supply for 2 ASi circuits“: only 1 gateway + 1 ASi power supply is needed for both 2 ASi circuits	–	•

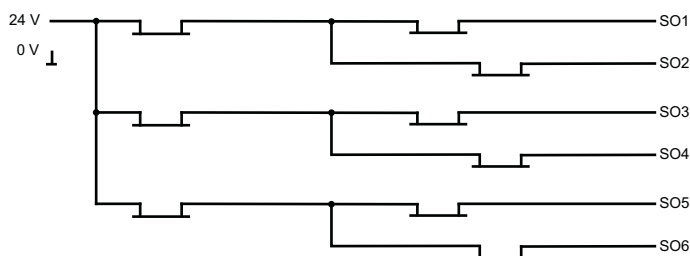
## Safety outputs block diagram

### BWU2642:



## Safety outputs block diagram

### BWU2798, BWU2828, BWU3080



## Variations of terminal configuration for

### BWU2798, BWU2828, BWU3080

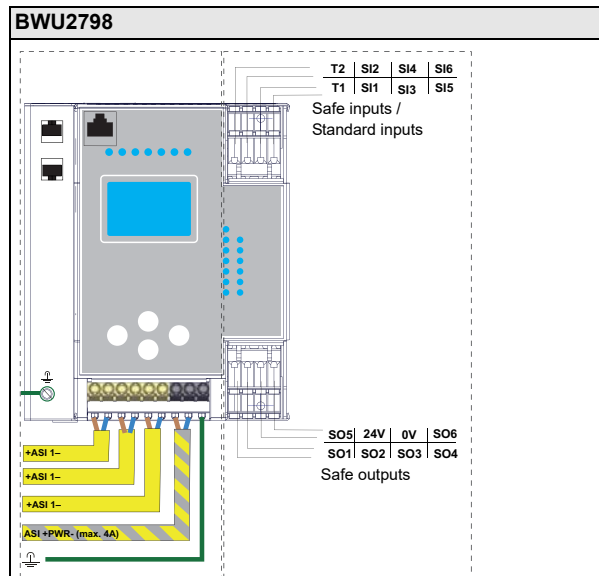
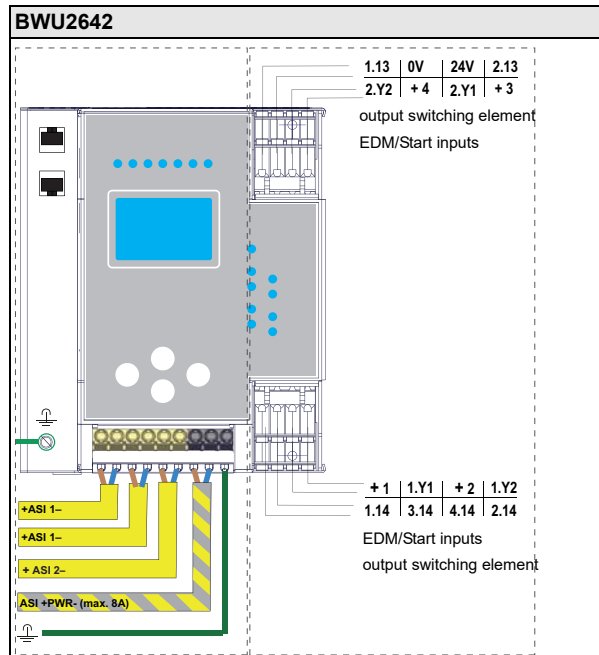
Terminal	Safe output	Safe input for mechanical contacts in combination with T1, T2 <sup>(1)</sup>	Safe antivalent input <sup>(1)</sup>	Safe electronic input <sup>(1)</sup>	Standard input <sup>(1)</sup>
SI1,2	–	•	•	•	•
SI3,4	–	•	•	•	•
SI5,6	–	•	•	•	•
SO1,2 <sup>(2)</sup>	•	•	•	–	•
SO3,4 <sup>(2)</sup>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

<sup>(1)</sup> Inputs may only be supplied by the same 24 V source as the device itself.

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

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## 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>Safe inputs / Standard inputs</p> <p>Safe outputs</p> <p>+ASI 1- +ASI 1- +ASI 2- +ASI +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 circuits	
	ASI +PWR-	Power supply for Gateway and ASi networks	

BWU3080	Connection	Description	
<p>Safe inputs / Standard inputs</p> <p>Safe outputs</p> <p>+AS1- +AS12 +PWR- (max. 8A) +AS12- +AS12 +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	
	24V, 0V	Power supply for local I/Os	
	+AS1 1-, +AS1 2-	Connection of ASi circuits	
	AS11 +PWR-, AS12 +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.: 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](http://www.bihl-wiedemann.de/en/products/accessories/power-supplies))