AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

AS-i 3.0 PROFINET Gateways with integrated Safety Monitor

(Figure similar)

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 AS-i outputs are supported

- **up to 32 independent AS-i outputs Multiple safe AS-i outputs possible via a single AS-i address**

1 Safety Monitor for 2 AS-i networks

- **Operation using a single Monitor configuration! Monitor processes safety slaves on two AS-i 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	Type	Inputs safety, expandable to	Outputs Safety, SIL 3, cat. 4	Safety outputs, independent according to SIL 3, expandable to	Safety communication	Number of AS-i networks, number of AS-i Master (1)	1 power supply, 1 gateway for 2 AS-i networks, inexpensive power supplies (2)	Diagnostic and configuration interface (3)	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 AS-i networks, 2 AS-i Masters	yes, max. 4 A/ AS-i network	Ethernet fieldbus; Ethernet diagnostics	**BWU2828**
	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 AS-i networks, 2 AS-i Masters	no, max. 8 A/ AS-i network, redundant supply	Ethernet fieldbus; Ethernet diagnostics	**BWU3080**
	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 AS-i network, 1 AS-i Master	yes, max. 4 A/ AS-i network	Ethernet fieldbus; Ethernet diagnostics	**BWU2798**
	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 AS-i networks, 2 AS-i Masters	yes, max. 4 A/ AS-i network	Ethernet fieldbus + RS 232	**BWU2642**

(1) **Number of AS-i networks, number of AS-i Master**
"Single Master": 1 AS-i network, 1 AS-i Master.
"Double Master": 2 AS-i networks, 2 AS-i Masters.

(2) **1 power supply, 1 gateway for 2 AS-i networks, inexpensive power supplies**
"yes, max. 4 A/AS-i network": Cost-effective power for 2 AS-i networks with 1 power supply (optionally supply of multiple Single Gateways by 1 power supply).
"no, max. 8 A/AS-i network, redundant supply": 1 power supply per AS-i network. Gateway is powered in normal operation from one of the two AS-i power supplies. Should one AS-i power supply fail, switching to the other AS-i power supply allows all the diagnostics functions to be maintained and the unaffected AS-i network continues to operate.

(3) **Diagnostic and configuration interface**
"Ethernet fieldbus + Ethernet diagnostic": Access to AS-i master and safety monitor via Bihl+Wiedemann proprietary software over Ethernet diagnostics interface or Ethernet fieldbus interface.
"Ethernet fieldbus + RS 232": Access to AS-i 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
Interface			
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		
AS-i			
AS-i specification	3.0		
Cycle time	150 µs * (number of slaves + 2)		
Operating voltage	30 V_{DC} (20 ... 31,6 V) (PELV voltage)		
AS-i Power24V capability (1)	yes		no
AUX			
Operating voltage	24 V_{DC} (19,2 ... 28,8 V)		
Max current consumption	1 A	7,2 A	
Display			
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 AS-i (green)	AS-i voltage OK		
LED AS-i active (green)	AS-i 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	

Article no.	BWU2642	BWU2798 / BWU2828	BWU3080
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.		
c**TÜV**us	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		
Ambient			
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	≥500 V		
Weight	800 g		
Dimensions (W / H / D in mm)	109 / 120 / 96	109 / 120 / 106	

(1) **AS-i 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
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 (2)
Speed monitors for local inputs	–	3 to 6 axes up to 400 Hz (3)
Connection		
Connection	COMBICON	
Length of connector cable	I/O: max. 15 m	unlimited (4)
Input		
Inputs Safety, SIL3, cat. 4	–	3 x 2 channels (5)
Inputs digital, EDM	4	up to 6 standard inputs (5)
Switching current	30 mA (T = 100 µs), continuously 4 mA at 24 V	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AS-i	out of AUX
Tolerated test pulse	–	adjustable

Article no.	BWU2642	BWU2798 / BWU2828 / BWU3080
Output		
Number of release circuits on the monitor	4	6
Outputs	relay outputs (output circuits 1 and 2) max. contact load (1): 3 A_{AC-15} at 30 V, 3 A_{DC-13} at 30 V	semiconductor output max. contact load: 1,2 A_{DC-13} at 30 V, ∑= 7,2 A in sum (6)
	semiconductor outputs (output circuits 3 and 4) max. contact load: 0,5 A_{DC-13} at 30 V	
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.

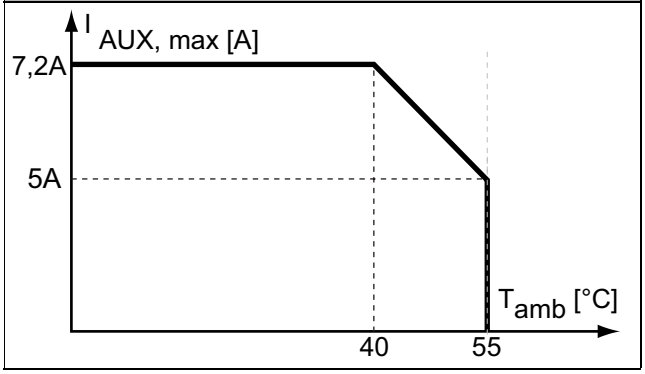
(3) connection only at terminals SO1 ... SO6 configured as standard inputs (see “Variations of terminal configuration for BWU2798, BWU2828, BWU3080”)

(4) loop resistance ≤ 150 Ω

(5) see “Variations of terminal configuration for BWU2798, BWU2828, BWU3080”

(6)

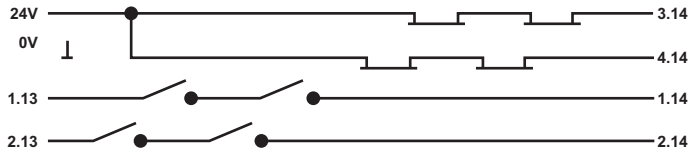
BWU2798, BWU2828, BWU3080
Derating output current



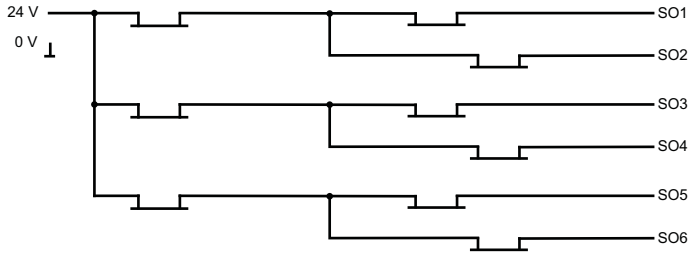
Article no.	Operating current		
	Master power supply, ca. 300 mA out of AS-i circuits	Master power supply, max. 300 mA out of AS-i circuit 1 (approx. 70 mA ... 300 mA), max. 300 mA out of AS-i circuit 2 (approx. 70 mA ... 300 mA); in sum max. 370 mA	Version „1 gateway, 1 power supply, for 2 AS-i networks“,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

	BWU3080	BWU2642 / BWU2798 / BWU2828
Redundant power supply out of AS-i: all fundamental functions of the device remain available even in case of power failure in one of the two AS-i networks	•	–
Current measurement of the AS-i circuits	–	•
Self-resetting adjustable fuses	–	•
AS-i earth fault monitor distinguishes between AS-i cable and sensor cable	–	•
In version „1 gateway, 1 power supply for 2 AS-i circuits“: only 1 gateway + 1 AS-i power supply is needed for both 2 AS-i circuits	–	•

Safety outputs block diagram BWU2642:



Safety outputs block diagram BWU2798, BWU2828, BWU3080



Variations of terminal configuration for BWU2798, BWU2828, BWU3080

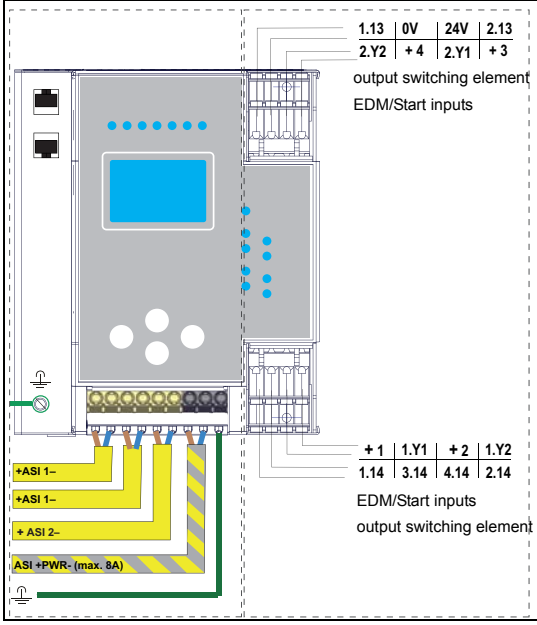
Terminal	Safe output	Safe input for mechanical contacts in combination with T1, T2 (1)	Safe antivalent input (1)	Safe electronic input (1)	Standard input (1)
SI1,2	–	•	•	•	•
SI3,4	–	•	•	•	•
SI5,6	–	•	•	•	•
SO1,2 (2)	•	•	•	–	•
SO3,4 (2)	•	•	•	–	•
SO5,6 (2)	•	•	•	–	•

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

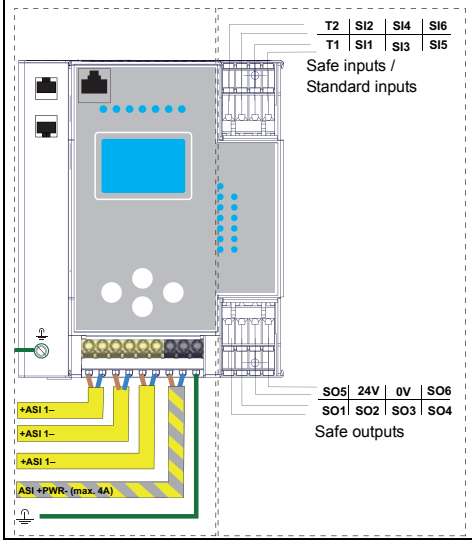
(2) If outputs are configured as inputs, the input current has to be limited by an external element at ≤100 mA

Connections: Gateway + Safety Monitor:

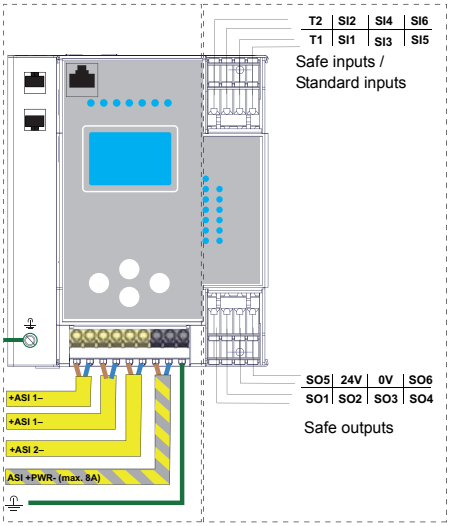
BWU2642

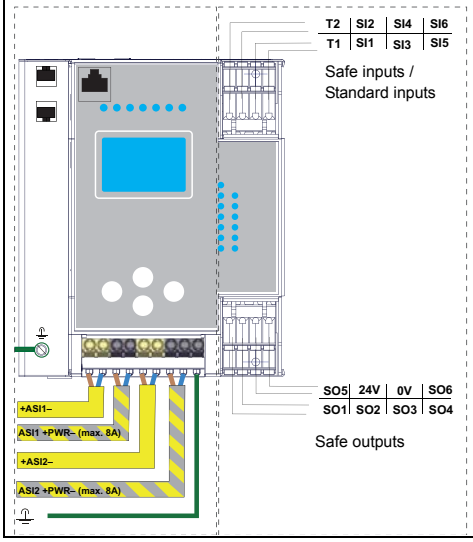


BWU2798



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 AS-i circuit
ASI +PWR-	Power supply for Gateway and AS-i networks

BWU2828	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 AS-i circuits
	ASI +PWR-	Power supply for Gateway and AS-i networks

BWU3080	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
	24V, 0V	Power supply for local I/Os
	+ASI 1-, +ASI 2-	Connection of AS-i circuits
	ASI1 +PWR-, ASI2 +PWR-	Power supply for Gateway and AS-i 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 Programming (art. no. BW2916)**
- **Power supplies, e.g.: AS-i power supply, 4 A (art. no. BW1649), AS-i power supply, 8 A (art. no. BW1997) (further power supply units can be found at *www.bihl-wiedemann.de/en/products/accessories/power-supplies*)**