

AS-i 3.0 Sercos Gateways with integrated Safety Monitor

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CIP Safety and Safe Link in one device

- up to zu 450 Devices

Safely monitoring safety drives with CIP Safety on Sercos

2 / 1 AS-i master, Sercos slave

- switch integrated

Up to 64 release circuits

- up to 6 release circuits SIL 3, cat. 4 on the monitor

Safe AS-i outputs are supported

- up to 64 independent AS-i outputs
Multiple safe AS-i outputs possible via a single AS-i address

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 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⁾ | Art. no. |
|--------|----------------|---|---|---|---|---|--|---|----------------|
| | Safety, Sercos | max. 62 x 2 channels, max. 1922 in max. configuration | 6 release circuits; 6 x fast electronic safe outputs | max. 64, max. 1984 in max. configuration | CIP Safety over Sercos + Safe Link | 2 AS-i networks, 2 AS-i masters | yes, max. 4 A/AS-i network | Ethernet diagnostic | BWU3160 |
| | Safety, Sercos | max. 62 x 2 channels, max. 1922 in max. configuration | 6 release circuits; 6 x fast electronic safe outputs | max. 64, max. 1984 in max. configuration | Schneider drives via Sercos + Safe Link | 2 AS-i networks, 2 AS-i masters | yes, max. 4 A/AS-i network | Ethernet diagnostic | BWU2984 |
| | Safety, Sercos | 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, 1 AS-i master | yes, max. 4 A/AS-i network | Ethernet diagnostic | BWU2588 |

(1) **Number of AS-i networks, number of AS-i Master**

"Double Master": 2 AS-i networks, 2 AS-i Masters.

"Optional AS-i Safety coupling circuit": 2 AS-i networks, 1 AS-i Master.

(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). Operation with short cable lengths with standard 24 V power supply possible.

(3) **Diagnostic and configuration interface**

"Ethernet diagnostic": Access to AS-i Master and Safety Monitor with Bihl+Wiedemann software by using the Ethernet diagnostic 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. | BWU2588 | BWU2984 | BWU3160 |
|--|---|---|---------|
| Interface | | | |
| Ethernet interface | 2 x RJ-45: 100MBaud, 2-Port-Switch, Sercos III | | |
| Baud rates | 100 MBaud | | |
| Card slot | chip card for storage of configuration data | | |
| AS-i | | | |
| AS-i specification | 3.0 | | |
| Cycle time | 150 μ s * (number of slaves + 2) | | |
| Operating voltage | 30 V (20 ... 31.6 V) | | |
| AS-i Power24V capability ⁽¹⁾ | yes | | |
| 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 Sercos (green) | Sercos communication active | | |
| LED config error (red) | configuration error | | |
| LED U AS-i (green) | AS-i voltage o.k. | | |
| 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 (green) | auxiliary power | | |
| LEDs 1.Y1, 1.Y2, 2.Y1, 2.Y2 (EDM/Start) (yellow) | state of inputs: LED off:open LED on:closed | - | |
| LEDs K1 ... K4 (green) | state of outputs: LED off: open LED on: closed | - | |
| LEDs SI1 ... SI6 (yellow) | - | state of inputs: LED off:open LED on:closed | |
| LEDs SO1 ... SO6 (yellow) | - | state of inputs: 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. | | |
| Applied standards | EN 60529 EN 62026-2 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PLe | | |
| Environment | | | |
| Operating altitude | 2000 m | | |
| Ambient temperature | 0 °C ... +55 °C | | |
| Storage temperature | -25 °C ... +85 °C | | |
| Pollution degree | 2 | | |
| Housing | stainless steel, for DIN rail mounting | | |
| 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 | | |

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| Article no. | BWU2588 | BWU2984 | BWU3160 |
|------------------------------|-----------------|---------|---------|
| Weight | 800 g | | |
| Dimensions (W / H / D in mm) | 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. | BWU2588 | BWU2984 | BWU3160 |
|---|---|---|---------|
| 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 ⁽⁴⁾ | 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 | |
| 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 outputs (output circuits 3 and 4): max. contact load: 0,5 A _{DC-13} at 30 V | semiconductor output max. contact load: 1,2 A _{DC-13} at 30 V, Σ = 7,2 A in sum ⁽⁶⁾ | |
| 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.

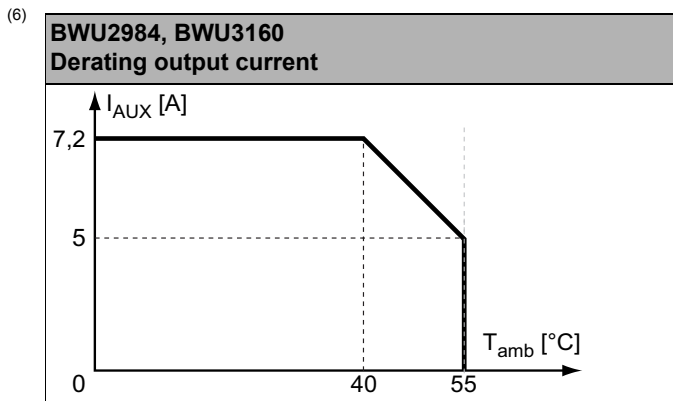
⁽²⁾ connection at all SI or SO terminals possible.

⁽³⁾ connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU2984, BWU3160")

⁽⁴⁾ loop resistance ≤150 Ω

⁽⁵⁾ see "Variations of terminal configuration for BWU2984, BWU3160"

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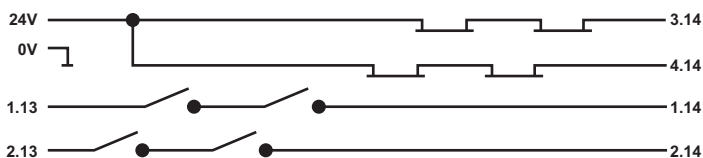


| Article no. | Operating current | | |
|-------------|--|---|--|
| | master power supply, approx 300 mA out of AS-i network | master power supply, max. 300 mA out of AS-i circuit 1 (approx. 70 mA ... 300 mA), max. 300 mA out of AS-i circuit 2 (approx. 70 mA ... 300 mA); in sum max. 370 mA | Version „1 Gateway, 1 power supply for 2 AS-i circuits“, ca. 350 mA (PELV voltage) |
| BWU2588 | - | - | • |
| BWU3160 | - | - | • |
| BWU2984 | - | - | • |

| | BWU2588 | BWU2984 / BWU3160 |
|--|---------|-------------------|
| 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 | - | • |

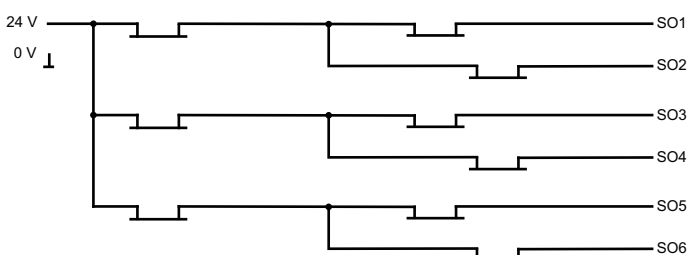
Safety outputs block diagram

BWU2588:



Safety outputs block diagram

BWU2984, BWU3160:



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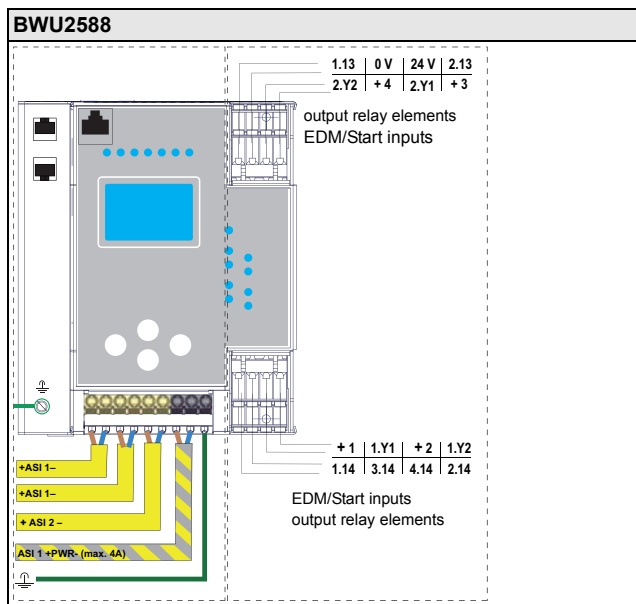
Variations of terminal configuration for BWU2984, BWU3160

| 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⁾ | • | • | • | – | • |

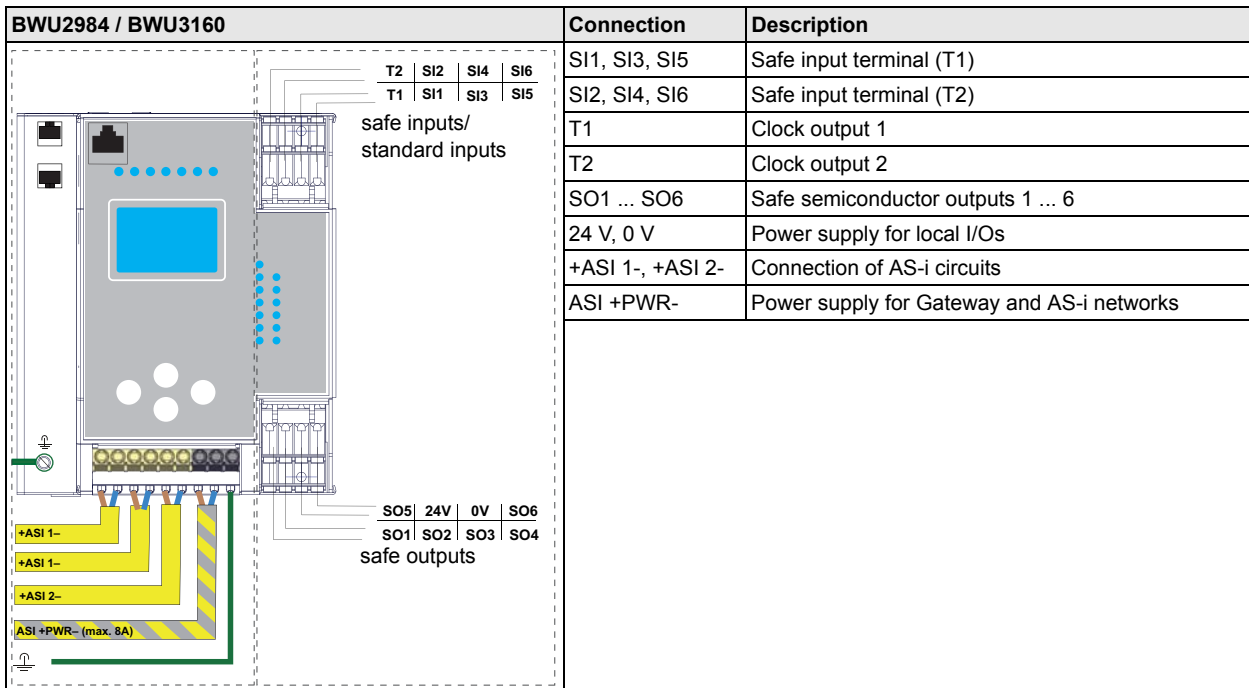
⁽¹⁾ Inputs may only be supplied by the same 24 V source as the device itself.

⁽²⁾ If outputs are configured as inputs, the input current has to be limited by an external element at $\leq 100\text{mA}$ (slow-blow fuse).

Connections: Gateway + Safety Monitor:



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Accessories:

- Safe contact expander, 1 or 2 independent channels (art. no. BWU2548 / BWU2539)
- Bihl+Wiedemann Suite - Safety Software for Configuration, Diagnostics and Commissioning (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)