

ASi-5/ASi-3 PROFINET Gateway with integrated ASi-5/ASi-3 Safety Monitor



ASi-5 – Great data bandwidth, short cycle times

Compatible with all ASi generations

Safety Monitor supports ASi-5 Safety and ASi-3 Safety

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

Up to 31 release circuits

- up to 6 safe output circuits CAT4, SIL 3 on the Monitor, electronic safe outputs

Safe ASi outputs are supported

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



(Figure similar)

OPC UA interface and REST API for IIoT applications

Integrated web server for simple diagnostics and maintenance


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 and additional data



| Figure | Fieldbus Interface | Safety communication | Inputs Safety ⁽¹⁾ | Outputs Safety, SIL 3, cat. 4 | ASi-5/ASi-3 | ASi Safety | Number of ASi networks, number of ASi Master ⁽²⁾ | Integrated decoupling, ASi current measurement in the gateway ⁽³⁾ | Diagnostic and configuration interface ⁽⁴⁾ | Article No. |
|---|--------------------|----------------------|---------------------------------|---|--------------------------|--|---|--|---|----------------|
|  | PROFINET, OPC UA | Safe Link | 6 x 1 channel or 3 x 2 channels | 6 release circuits; 6 x electronic safe outputs | ASi-5 + ASi-3 compatible | ASi-5 Safety and ASi-3 Safety compatible | 1 ASi network, 1 ASi-5 /ASi-3 Master | yes, max. 4 A/ASi network | Ethernet fieldbus; Ethernet diagnostics | BWU3955 |

- Inputs Safety**
Safe inputs can be configured as 1-channel or 2-channel depending on the desired application or PL and SIL level. Suitable for applications up to category 4/PLe/SIL3.
- Number of ASi networks, number of ASi Master**
"Single Master": 1 ASi network, 1 ASi-5/ASi-3 Master.
- 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.
- 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.
The latest version of the device description file of the gateway is available in the "Downloads" section of the respective device.

ASi-5/ASi-3 PROFINET Gateway with integrated ASi-5/ASi-3 Safety Monitor

| | |
|--|---|
| Article no. | BWU3955 |
| Fieldbus Interface | |
| Type | PROFINET; 2 x RJ-45, integrated 2-Port-Switch, IRT capability Class B, integrated switch complies with Class C (IRT capability) |
| Baud rates | 10/100 MBaud |
| IT Interface | OPC UA server, integrated web server, REST API |
| Safety communication | Safe Link |
| Function | PROFINET IO Device Media Redundancy Protocol (MRP) Shared Device |
| Card slot | Chip card (BW4785) for storage of configuration and additional data |
| Diagnostic Interface | |
| Type | Ethernet; RJ-45 acc. to IEEE 802.3 |
| Baud rates | 10/100 MBaud half-/full duplex |
| IT Interface | OPC UA server, integrated web server, REST API |
| Safety communication | Safe Link |
| ASi | |
| ASi specification | ASi-5 + ASi-3 |
| Cycle time | Cycle time ASi-5 (constant): 1,27 ms for 384 bits input data + 384 bits output data Cycle time ASi-3 (variable): 150 μ s * (number of ASi-3 nodes + 2) |
| ASi Safety | ASi-5 Safety + ASi-3 Safety compatible |
| Operating voltage | 30 V _{DC} (20 ... 31,6 V) (PELV voltage) |
| Operating current | 300 mA |
| ASi Power24V capability ⁽¹⁾ | yes |
| AUX | |
| Operating voltage | 24 V _{DC} (19,2 ... 28,8 V) |
| Max current consumption | 7,2 A |
| Display | |
| LCD | menu, 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 on |
| 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 voltage source with a PELV/SELV voltage \leq 30 V _{DC} 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 PROFINET Gateway with integrated ASi-5/ASi-3 Safety Monitor

| | |
|---|---|
| Article no. | BWU3955 |
| Ambient | |
| 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 | -25 °C ... +55 °C (no condensation permitted) |
| Storage temperature | -25 °C ... +85 °C |
| Operating altitude | max. 2000 m |
| Housing | stainless steel, for DIN-rail mounting |
| Pollution degree | 2 |
| 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 / 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. | BWU3955 |
| Safety Monitor | |
| ASi Safety | ASi-5 Safety + ASi-3 Safety compatible |
| 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 ⁽¹⁾ |
| Speed monitors for local inputs | 3 to 6 axes up to 400 Hz ⁽²⁾ |
| Connection | |
| Connection | Push-in terminals |
| Length of connector cable | unlimited ⁽³⁾ |
| Input | |
| Inputs Safety, SIL3, cat. 4 | up to 6 x 1-channel safe inputs (SIL1, cat. 2, PLc) or up to 3 x 2-channel safe inputs (SIL3, cat. 4, PLe) ⁽⁴⁾ |
| Inputs digital, EDM | up to 12 standard inputs ⁽⁴⁾ |
| Switching current | 15 mA (T = 100 µs), continuously 4 mA at 24 V |
| Power supply | out of AUX |
| Output | |
| Number of release circuits on the monitor | 6 release circuits; 6 x electronic safe outputs ⁽⁴⁾ |
| Outputs | semiconductor output max. contact load: 1,2 A _{DC-13} at 30 V, $\Sigma = 7,2$ A in sum ⁽⁵⁾ |
| Power supply (semiconductor outputs) | out of AUX |
| 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.

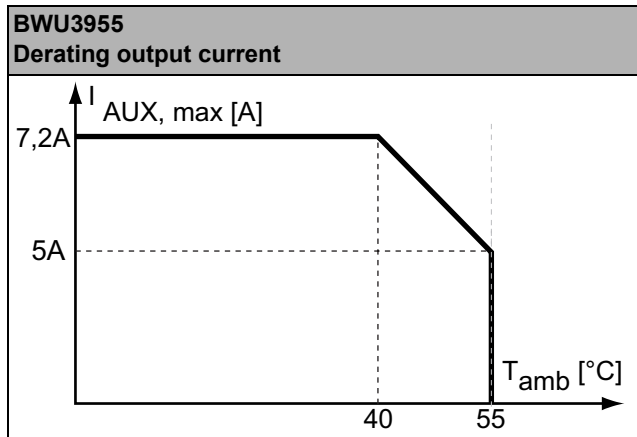
⁽²⁾ connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU3955")

⁽³⁾ loop resistance ≤ 150 Ω

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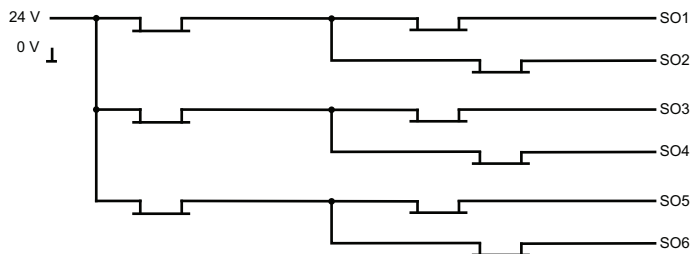
(4) see "Variations of terminal configuration for BWU3955"

(5)



| | BWU3955 |
|---|---------|
| 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 BWU3955



ASi-5/ASi-3 PROFINET Gateway with integrated ASi-5/ASi-3 Safety Monitor

Variations of terminal configuration for BWU3955

| Terminal | up to 6 safe outputs | up to 6 safe 2 channel inputs for floating contacts in combination with T1, T2 ⁽¹⁾ | up to 6 safe 2 channel inputs for antivalent switches ⁽¹⁾ | up to 3 safe 2 channel inputs for OSSDs | up to 12 safe 1 channel inputs ⁽¹⁾ | up to 12 standard inputs ⁽¹⁾ |
|--------------------|----------------------|---|--|---|---|---|
| SI1 | - | • | • | • | • | • |
| SI2 | - | • | • | • | • | • |
| SI3 | - | • | • | • | • | • |
| SI4 | - | • | • | • | • | • |
| SI5 | - | • | • | • | • | • |
| SI6 | - | • | • | • | • | • |
| SO1 ⁽²⁾ | • | • | • | - | • | • |
| SO2 ⁽²⁾ | • | • | • | - | • | • |
| SO3 ⁽²⁾ | • | • | • | - | • | • |
| SO4 ⁽²⁾ | • | • | • | - | • | • |
| SO5 ⁽²⁾ | • | • | • | - | • | • |
| SO6 ⁽²⁾ | • | • | • | - | • | • |

(1) Inputs must be supplied from the same 24 V 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 $\leq 100\text{mA}$

Connections: Gateway + Safety Monitor:

| BWU3955 | Connection | Description |
|---|---------------|---|
| <p>The diagram shows the terminal block layout for the BWU3955. It includes connections for safe inputs (SI1-SI6), safe outputs (SO1-SO6), clock outputs (T1, T2), and power supply terminals (+ASI 1-, ASI +PWR-, 24V, 0V). The safe inputs and outputs are grouped into two columns: T2 SI2 SI4 SI6 and T1 SI1 SI3 SI5. The power supply terminals are labeled as SO5 24V 0V SO6 and SO1 SO2 SO3 SO4.</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- | 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 for storage of configuration and additional data, memory capacity $\geq 16\text{ GB}$ (art. no. BW4785)
- 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)
- PROFINET Master Simulators Licenses (art. no. BW4754, BW4755)