

ASi-5/ASi-3 EtherNet/IP + Modbus TCP- 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

CIP Safety™ (1) over EtherNet/IP™ (1) and Safe Link in one device

1 ASi-5/ASi-3 master, EtherNet/IP + Modbus TCP device

- switch integrated

Up to 64 release circuits

- up to 6 release circuits SIL 3, cat. 4 on the Monitor, electronic safe outputs

Safe ASi outputs are supported

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

OPC UA interface and REST API for IIoT applications

Integrated web server for simple diagnostics and maintenance

Safe speed and standstill monitoring

Applications up to category 4/PLe/SIL 3


Chip card for storage of configuration data



(figure similar)



(1) EtherNet/IP™, CIP™ and CIP Safety™ are registered trademarks of ODVA®, Inc.

| Figure | Interface, fieldbus | Safety communication | Inputs Safety (1) | Outputs Safety, SIL 3, cat. 4 | 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) | Art. no. |
|---|----------------------------------|---|---------------------------------|---|--|--|---|--|----------------|
|  | EtherNet/IP + Modbus TCP, OPC UA | CIP Safety over EtherNet/IP + Safe Link | 6 x 1 channel or 3 x 2 channels | 6 release circuits; 6 x electronic safe outputs | ASi-5 Safety + ASi-3 Safety compatible | 1 ASi network, 1 ASi-5/ASi-3 Master | yes, max. 4 A/ASi network | Ethernet fieldbus, Ethernet diagnostic | BWU4006 |

(1) 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.

(2) Number of ASi networks, number of ASi Master

"Single Master": 1 ASi network, 1 ASi-5/ASi-3 Master.

(3) 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.

(4) Diagnostic and configuration interface

"Ethernet fieldbus + Ethernet diagnostic": Access to ASi Master and Safety Monitor with Bihl+Wiedemann software by using the Ethernet diagnostic 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 EtherNet/IP + Modbus TCP- Gateway with integrated ASi-5/ASi-3 Safety Monitor

| | |
|--|--|
| Article no. | BWU4006 |
| Fieldbus interface | |
| Type | Ethernet + Modbus TCP acc. to IEEE 802.3 2 x RJ-45, integrated 2-Port-Switch |
| Baud rate | 10/100 MBaud |
| IT interface | OPC UA server, web server, REST API |
| Safety communication | CIP Safety over EtherNet/IP + Safe Link |
| Variably configurable Assembly Objects | yes |
| Function | Device Level Ring (DLR) (Ethernet/IP only) |
| Card slot | chip card (BW4785) for storage of configuration data |
| Diagnostic interface | |
| Type | Ethernet; RJ-45 acc. to IEEE 802.3 |
| Baud rate | 10/100 MBaud half-duplex or full-duplex |
| IT interface | OPC UA server, 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 and 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 net (green) | Ethernet network active |
| LED config error (red) | configuration error |
| LED U ASi (green) | ASi voltage o.k. |
| LED ASi active (green) | ASi normal operation active |
| LED prg enable (green) | automatic address programming enabled |
| LED prj mode (yellow) | configuration mode active |
| LED AUX (green) | ASi power on and auxiliary power on |
| LEDs SI1 ... SI6 (yellow) | state of inputs: LED off: open LED on: closed |
| LEDs SO1 ... SO6 (yellow) | state of outputs: LED off: open LED on: closed |
| UL-specifications (UL508) | |
| External protection | An isolated voltage source with a PELV/SELV voltage ≤ 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 EtherNet/IP + Modbus TCP- Gateway with integrated ASi-5/ASi-3 Safety Monitor

| | |
|--|---|
| Article no. | BWU4006 |
| Environment | |
| Applied standards | EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL 3 EN 61508, SIL 3 EN ISO 13849-1, PL _e |
| Operating altitude | 2000 m |
| Ambient temperature | -25 °C ... +55 °C (no condensation permitted) |
| Storage temperature | -25 °C ... +85 °C |
| Housing | stainless steel, for DIN rail mounting |
| Pollution Degree | 2 |
| 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 |
| Weight | 800 g |
| Dimensions (W / H / D in mm) | 109 / 120 / 106 |

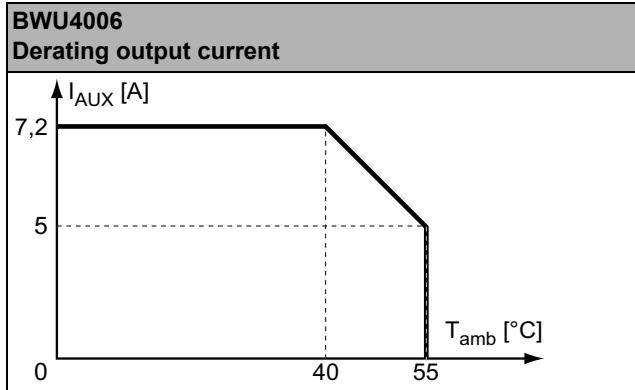
(1) ASi Power24V

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. | BWU4006 |
| Safety monitor | |
| ASi Safety | ASi-5 Safety and 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⁾ |
| Selection of Mode of Safe Operation | yes |
| 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, PL _c) or up to 3 x 2-channel safe inputs (SIL3, cat. 4, PL _e) ⁽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 |
| Sensor supply | short-circuit and overload protected according to EN 61131-2 |
| Output | |
| Number of release circuits on the monitor | 6 release circuits; 6 x electronic safe outputs |
| Outputs | semiconductor output max. contact load: 1,2 A _{DC-13} at 30 V, Σ = 7,2 A in sum ⁽⁵⁾ |
| Power supply (semiconductor outputs) | out of AUX |
| Output | short-circuit and overload protected according to EN 61131-2 |
| Test pulse (semiconductor outputs) | if output is on: minimum interval between 2 test pulses: 250 ms; maximum pulse width 1 ms |

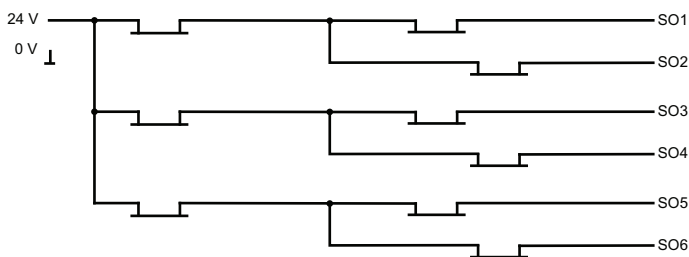
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- (1) connection at all SI or SO terminals possible.
- (2) connection only at terminals SO1 ... SO6 configured as standard inputs (see "Variations of terminal configuration for BWU4006")
- (3) loop resistance $\leq 150 \Omega$
- (4) see "Variations of terminal configuration for BWU4006"
- (5)



| | BWU4006 |
|---|----------------|
| 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 BWU4006:



ASi-5/ASi-3 EtherNet/IP + Modbus TCP- Gateway with integrated ASi-5/ASi-3 Safety Monitor

Variations of terminal configuration for BWU4006

| 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⁾ |
|--------------------|----------------------|---|--|---|---|---|
| SI | – | • | • | • | • | • |
| 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 ≤ 100mA

Connections: Gateway + Safety Monitor:

| BWU4006 | 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 circuits | |
| | 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 ≥16 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)