

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

ASi-5 – Great data bandwidth, short cycle times

Compatible with alls ASi generations

Safety monitor supports ASi-5 Safety and ASi-3 Safety

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

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

- switch integrated

Up to 31 release circuits

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

Safe ASi outputs are supported

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

OPC UA server and integrated web server for simplified diagnostics

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 similar)



| Figure | Fieldbus Interface | Safety communication | Inputs Safety, SIL 3, cat. 4 | Outputs Safety, SIL 3, cat. 4 | ASi-5/ASi-3 | ASi Safety | Number of ASi networks, number of ASi Master ⁽¹⁾ | Integrated decoupling, ASi current measurement in the gateway ⁽²⁾ | Diagnostic and configuration interface ⁽³⁾ | Art. no. |
|--------|----------------------------------|----------------------|------------------------------|--|----------------------------|--|---|--|---|----------|
| | EtherNet/IP + Modbus TCP, OPC UA | Safe Link | 3 x 2 channels | 6 release circuits; 6 x fast electronic safe outputs | ASi-5 and 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 diagnostic | BWU3957 |

(1) **Number of ASi networks, number of ASi Master**
"Single Master": 1 ASi network, 1 ASi-5/ASi-3 Master.

(2) **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.

(3) **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 Safety Monitor

| | |
|---|--|
| Article no. | BWU3957 |
| Fieldbus interface | |
| Type | EtherNet + Modbus TCP acc. to IEEE 802.3 2 x RJ-45, integrated 2-Port-Switch |
| Baud rate | 10/100 MBaud |
| OPC UA interface | OPC UA server + web server |
| Safety communication | Safe Link |
| Variably configurable Assembly Objects | yes |
| Function | Device Level Ring (DLR) (EtherNet/IP only) |
| Card slot | chip card (BW4785) for storage of configuration and additional data |
| Diagnostic interface | |
| Type | Ethernet; RJ-45 acc. to IEEE 802.3 |
| Baud rate | 10/100 MBaud half-duplex or full-duplex |
| OPC UA interface | OPC UA server + web server |
| 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 communication 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 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. |

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

| | |
|--|---|
| Article no. | BWU3957 |
| 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.

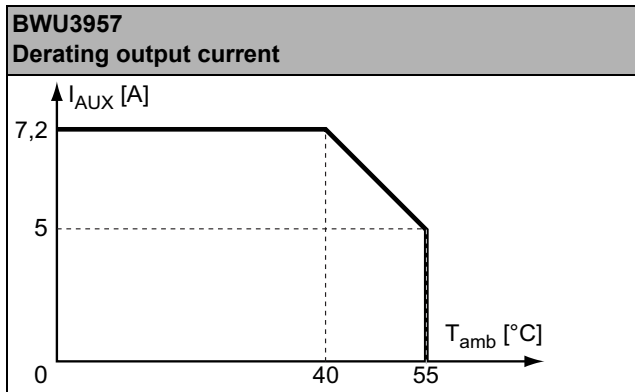
| | |
|---|--|
| Article no. | BWU3957 |
| Safety monitor | |
| ASi Safety | ASi-5 Safety and ASi-3 Safety compatible |
| Start delay | < 10 ms |
| Max. turn-off time | < 40 ms |
| Antivalent switches for local inputs | yes |
| Standstill monitors for local inputs | 6 axes, up to 50 Hz ⁽¹⁾ |
| Speed monitors for local inputs | 3 to 6 axes, up to 400 Hz ⁽²⁾ |
| Connection | |
| Connection | COMBICON |
| Length of connector cable | unlimited ⁽³⁾ |
| Input | |
| Inputs Safety, SIL3, cat. 4 | 3 x 2 channels ⁽⁴⁾ |
| Inputs digital, EDM | up to 6 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 |
| 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 |
| 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 |

⁽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 BWU3957")

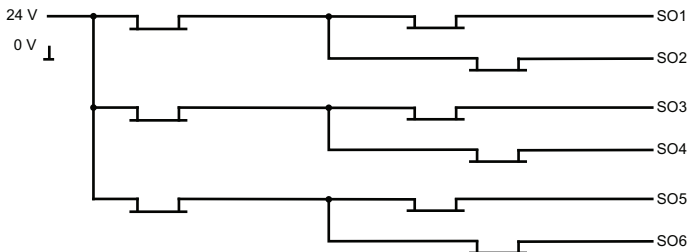
ASi-5/ASi-3 EtherNet/IP + Modbus TCP-Gateway with integrated Safety Monitor

- (3) loop resistance $\leq 150 \Omega$
- (4) see "Variations of terminal configuration for BWU3957"
- (5)



| | BWU3957 |
|---|---------|
| 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 BWU3957:



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

Variations of terminal configuration for BWU3957

| 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 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 ≤ 100 mA.

Connections: Gateway + Safety Monitor:

| BWU3957 | Connection | Description |
|--|---------------|---|
| <p>The diagram shows the terminal block layout for the BWU3957. It is divided into two main sections: 'safe inputs/standard inputs' and 'safe outputs'. The top section contains terminals T1, T2, SI1, SI2, SI3, SI4, SI5, and SI6. The bottom section contains terminals SO1, SO2, SO3, SO4, SO5, SO6, 24V, and 0V. There are also terminals for +ASI 1- and ASI +PWR- (max. 4A) shown with yellow and green wiring.</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 ≥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)