

ASi Safety Output Module with ASi Diagnostic node

Safety outputs, safety inputs and standard inputs in one module

4 x electronic safe outputs

2 x 2-channels safe inputs, adjustable as floating contacts or OSSDs or standard inputs

2 (up to 6) standard inputs



(figure similar)

Article no. BWU3064: ASi Safety Output Module with ASi Diagnostic node

The addresses are set by a configuration node via the ASIMON. All ASi Safety Output Modules with the same safety address switch simultaneously.

Additional AB addresses are available for diagnostics including 4 inputs for EDM and 4 standard outputs to control the safety outputs.

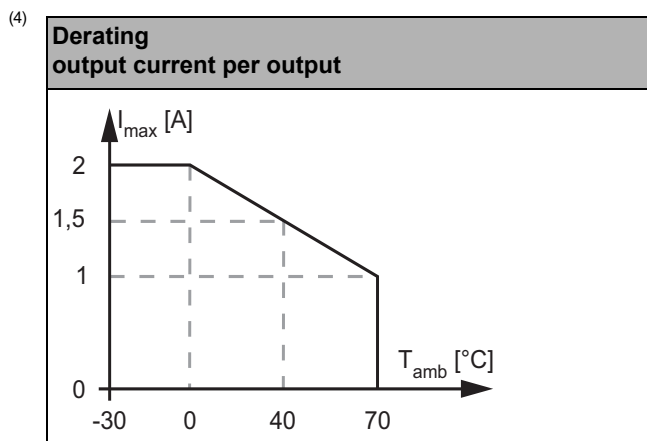
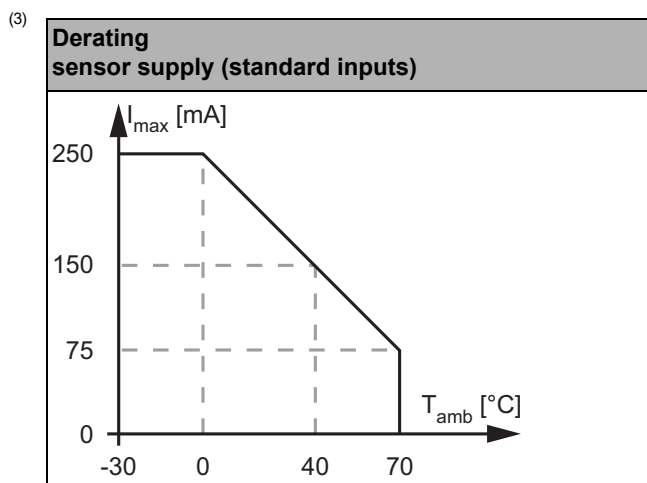
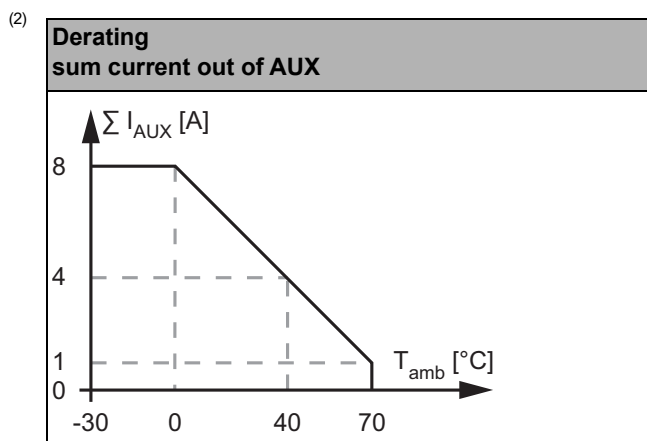
| | | |
|-------------------------------------|---|--|
| Article no. | BWU3064 | |
| Connection | | |
| ASi/AUX connection | profile cable and piercing technology | |
| Periphery connection | M12 | |
| Length of connector cable | unlimited ⁽¹⁾ | |
| ASi | | |
| Profile | safe ASi input nodes: S-0.B.0 (ID1=F) and S-0.B.1 (ID1=F) ASi diagnostic nodes: S-7.A.E (ID1=5) 4I/4O ASi nodes: S-7.E (ID1=F) ASi configuration node: S-7.A.5 (ID1=7) | |
| Addresses | depending on configuration | |
| Required Master profile | ≥M3 | |
| Since ASi specification | 3.0 | |
| Operating voltage | 30 V _{DC} (18 ... 31,6 V) | |
| Max. current consumption | <200 mA | |
| AUX | | |
| Voltage | 24 V (18 ... 30 V) | |
| Max. current consumption | 8 A ⁽²⁾ | |
| Input | | |
| Number | 2 standard inputs (up to 6, depending on configuration) 2 x 2-channels safe inputs (SIL3, cat. 4, PLe) for floating contacts or OSSD | |
| Switching current | 15 mA (T = 100 μs), continuously 4 mA at 24 V | |
| OSSD test pulses | 0 ... 50 Hz | |
| OSSD test pulse width | 0 ... 51 ms, adjustable | |
| Clock outputs for floating contacts | 1 test pulse per clock output per second, pulse duration approx. 1 ms | |
| Power supply | out of AUX | |
| Power supply of attached sensors | up to 0 °C | 250 mA, Σ(In/Out) 8 A ^{(2) (3)} |
| | at 40 °C | 150 mA, Σ(In/Out) 4 A ^{(2) (3)} |
| | at 70 °C | 75 mA, Σ(In/Out) 1 A ^{(2) (3)} |
| Max. current for OSSD | up to 0 °C | 1 A, Σ(In/Out) 8 A ^{(2) (4)} |
| | at 40 °C | 1 A, Σ(In/Out) 4 A ^{(2) (4)} |
| | at 70 °C | 1 A, Σ(In/Out) 1 A ^{(2) (4)} |
| Switching threshold | <5 V (low) >15 V (high) | |

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| | | |
|--|------------|---|
| Article no. | | BWU3064 |
| Output | | |
| Number | | 4 release circuits; 4 x electronic safe outputs |
| Max. contact load | | 2 A at 24 V (1,0 A _{DC-13} at 24 V) ⁽²⁾ ⁽⁴⁾ |
| Power supply | | out of AUX |
| Max. output current | up to 0 °C | 2 A per output, $\Sigma(\text{In/Out})$ 8 A ⁽²⁾ ⁽⁴⁾ |
| | at 40 °C | 1,5 A per output, $\Sigma(\text{In/Out})$ 4 A ⁽²⁾ ⁽⁴⁾ |
| | at 70 °C | 1 A per output, $\Sigma(\text{In/Out})$ 1 A ⁽²⁾ ⁽⁴⁾ |
| Test pulse | | if output is on: minimum interval between 2 test pulses: 250 ms pulse width: 1 ms |
| Display | | |
| LED ASI (green) | | on: ASi voltage on flashing: ASi voltage on, but peripheral fault or ASi address 0 off: no ASi voltage |
| LED FLT/FAULT (red) | | on: ASi address 0 or ASi node offline flashing: peripheral fault off: ASi node online |
| LED AUX (green) | | on: 24 V _{DC} AUX off: no 24 V _{DC} AUX |
| LED MP (green / yellow / red) | | off: no chip card plugged in or chip card defect green: chip card plugged in and recognized yellow flashing: copying configuration from chip card to unconfigured module or from module to empty chip card red: configuration on chip card and module different or configuration on chip card incompatible with the device |
| LEDs I1 ...Ix (yellow) | | state of standard inputs I1, I2 |
| LEDs S1 ... Sx (yellow) | | state of safety inputs S1 ... S4 |
| LEDs SO1 SOx (yellow) | | state of safety outputs SO1 ... SO4 |
| Environment | | |
| Applied standards | | EN 61000-2 EN 61000-3 EN 61131-2 EN 62061 EN ISO 13849-1 EN 60529 |
| It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe | | yes ⁽⁵⁾ |
| Operating altitude | | max. 2000 m |
| Ambient Operating temperature | | -30 °C ... +40 °C (-30 °C ... +70 °C ⁽²⁾ ⁽³⁾ ⁽⁴⁾) |
| Storage temperature | | -30 °C ... +85 °C |
| Housing | | plastic, for screw mounting |
| Pollution Degree | | 2 |
| Protection category | | IP67 ⁽⁶⁾ |
| Tolerable loading referring to humidity | | according to EN 61131-2 |
| Max. tolerable shock load | | 30g, 11 ms, acc. EN 61131-2 |
| Max. tolerable vibration stress | | 5 ... 8 Hz 50 mm _{pp} /8 ... 500 Hz 6g, acc. EN 61131-2 |
| Voltage of insulation | | ≥500 V |
| Weight | | 225 g |
| Dimension (W / H / D in mm) | | 60 / 151 / 46 |

⁽¹⁾ loop resistance ≤150 Ω

ASi Safety Output Module with ASi Diagnostic node



- (5) The module is suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors can be assumed for the connection of the two ASi and AUX potentials.
- (6) IP67 can only be achieved if all open M12 sockets are sealed with suitable protection caps (see accessories).

| UL-specifications (UL508) BWU3064 | |
|--|---|
| External protection | An isolated source with a secondary open circuit voltage of $\leq 30 V_{DC}$ 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 Safety Output Module with ASi Diagnostic node

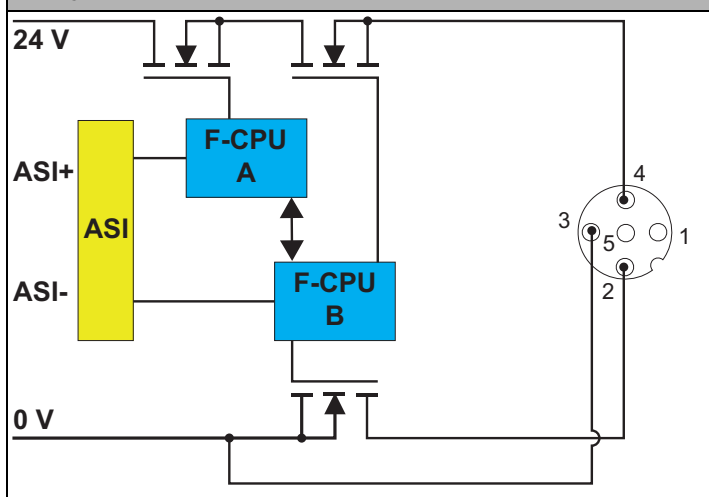
Pin assignment

| Signal name | Explanation |
|-------------------------|---|
| Ix | standard input x |
| Sx | safety input x, configurable as OSSD, floating contacts or standard input |
| SOx | safety output x |
| T1, T2 | clock output |
| 24 V _{ext.out} | power supply, out of external voltage, positive pole |
| 0 V _{ext.out} | power supply, out of external voltage, negative pole |
| n.c. | not connected |

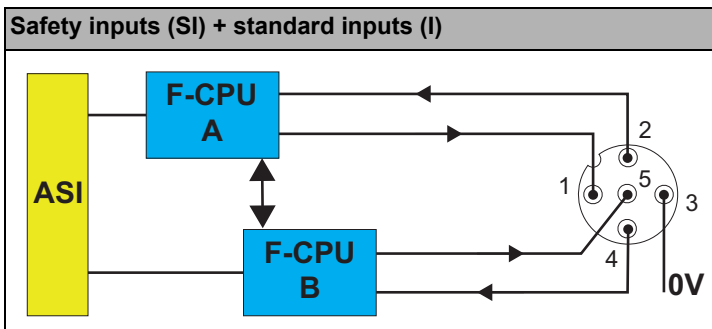
Connections

| Article no. | M12 connect. | Marking | Pin1 | Pin2 | Pin3 | Pin4 | Pin5 | | |
|-------------|---|---------|-------------------------|-------------------------|------------------------|------------------------|------|--|------|
| BWU3064 | X1 | I1 | 24 V _{ext.out} | I2 | 0 V _{ext.out} | I1 | n.c. | | |
| | X2 | I2 | 24 V _{ext.out} | n.c. | 0 V _{ext.out} | I2 | n.c. | | |
| | X3 | S11/S12 | standard | 24 V _{ext.out} | I5 | 0 V _{ext.out} | I3 | | n.c. |
| | | | float. cont. | T2 | S12 | n.c. | S11 | | T1 |
| | X4 | S21/S22 | standard | 24 V _{ext.out} | I6 | 0 V _{ext.out} | I4 | | n.c. |
| | | | float. cont. | T2 | S22 | n.c. | S21 | | T1 |
| | | | OSSD | 24 V _{ext.out} | S22 | 0 V _{ext.out} | S21 | | n.c. |
| | X5 | SO1 | n.c. | SO1- | 0 V _{ext.out} | SO1+ | n.c. | | |
| | X6 | SO2 | n.c. | SO2- | 0 V _{ext.out} | SO2+ | n.c. | | |
| | X7 | SO3 | n.c. | SO3- | 0 V _{ext.out} | SO3+ | n.c. | | |
| X8 | SO4 | n.c. | SO4- | 0 V _{ext.out} | SO4+ | n.c. | | | |
| ADDR | connection for ASi-3 addressing plug (protection cap) | | | | | | | | |
| MP | memory plug (protection cap) | | | | | | | | |

Safety outputs (SO)



ASi Safety Output Module with ASi Diagnostic node



Programming instructions (ASi bit assignment for safe inputs)

| Bit | D3 | D2 | D1 | D0 |
|--------------------------|-----|-----|-----|-----|
| Safe input SI1 (S11/S12) | S12 | S12 | S11 | S11 |
| Safe input SI2 (S21/S22) | S22 | S22 | S21 | S21 |

Programming instructions (bit assignment of ASi standard I/O nodes)

| Programming | ASi bit assignment | | | |
|-------------|--------------------|--------------|--------------|--|
| | D3 | D2 | D1 | D0 |
| Bit | D3 | D2 | D1 | D0 |
| | input | | | |
| Node 1 | I4 | I3 | I2 | I1 |
| Node 2 | not used | not used | I6 | I5 |
| | output | | | |
| Node 1 | if P0=1: SO4 | if P0=1: SO3 | if P0=1: SO2 | if P0=1: SO1 |
| Node 2 | not used | not used | not used | not used |
| | parameter bit | | | |
| | P3 | P2 | P1 | P0 |
| Node 1 | not used | not used | not used | 0: no influence on SO _n 1: switches output SO _n on, if safety release ⁽¹⁾ is active and bit D _{n-1} = 1 |
| Node 2 | not used | not used | not used | not used |

⁽¹⁾ see table „Release conditions“

Programming instructions (Bit values of the ASi diagnostic node 1, 2, 3 and 4)

| Bit | ASi Output | Bit | ASi Input |
|-----|--|-----|---|
| O3 | inexistent | I3 | Parameter P2 1: response input I _x (x = 1 ... 4) 0: response of state of release |
| O2 | not used | I2 | diagnostics (for definition see table „Device colors“) |
| O1 | not used | I1 | |
| O0 | Parameter P1=1 not used Parameter P1=0 1: switches output SO _n on, if the safety release ⁽¹⁾ is active 0: switches output SO _n off, even if the safety release ⁽¹⁾ is active | I0 | |

Peripheral fault indicates missing 24 V_{ext}.

⁽¹⁾ see table „Release conditions“

ASi Safety Output Module with ASi Diagnostic node

Programming instructions (bit values of the ASi parameter, diagnostic node)

| Bit | ASi Parameter |
|---------------|--|
| Bit P1 | |
| P1=0 | Safety output SO _n controlled by safety release ⁽¹⁾ and O0=1 |
| P1=1 | Safety output SO _n controlled by safety release only ⁽¹⁾ |

⁽¹⁾ see table „Release conditions“

Release conditions

| | | ASi Standard I/O nodes | | | |
|---------------------|---------------|------------------------|---------------------------|--------------------------|---------------------------|
| | | node 1 | | | |
| | | Parameter P0 = 0 | Parameter P0 = 1 | | |
| | | | Bit D _{n-1} = 0 | Bit D _{n-1} = 1 | |
| ASi diagnostic node | node 1 ... 4s | Parameter P1 = 1 | SO _n = release | SO _n = off | SO _n = release |
| | | Parameter P1 = 0 | SO _n = release | SO _n = off | SO _n = release |
| | | Bit O0 = 0 | SO _n = off | SO _n = off | SO _n = off |





















Diagnostics (device colors)


| Value | Color | Description | State change | LED SO _n |
|-------|-----------------|--|-----------------------------------|---------------------|
| 0 | green | output on | | on |
| 1 | green flashing | – | | – |
| 2 | yellow | restart inhibit | auxiliary signal 2 | 1 Hz |
| 3 | yellow flashing | – | | – |
| 4 | red | output off | | off |
| 5 | red flashing | waiting for "reset of error condition" or AUX is missing | auxiliary signal 1 or connect AUX | 8 Hz |
| 6 | gray | internal error, such as "fatal error" | only via "Power ON" on device | all LEDs flashing |
| 7 | green/yellow | output released, but not switched on | switching-on by setting of O0 | off |

LED status display

| LED | State | Signal / Description |
|-------------|-------|---|
| AUX (green) | | no 24 V _{DC} AUX |
| | | 24 V _{DC} AUX present |
| ASi (green) | | no ASi voltage |
| | | ASi voltage present, but at least one ASi node is addressed „0“ or peripheral fault |
| | | ASi voltage present |

ASi Safety Output Module with ASi Diagnostic node

| LED | State | Signal / Description |
|---|--|--|
| FLT (red) |  | ASi communication OK (at least one ASi node online) |
| |  1 Hz | at least one ASi node with peripheral fault |
| |  | no data exchange (with at least one correctly addressed ASi node) |
| I1, I2 (yellow) |  | input is switched off |
| |  | input is switched on |
| MP (green / yellow / red) |  | no chip card plugged in or chip card defect |
| |  1 Hz | copying configuration from chip card to unconfigured module or from module to empty chip card |
| |  | chip card plugged in and recognized |
| |  | configuration on chip card and device different or configuration incompatible with the device, user intervention is required. |
| S11 ... S22 (yellow) |  | safety input is switched off |
| |  1 Hz | cross-connection |
| |  8 Hz | internal error or double address |
| |  | safety input is switched on |
| SO1 ... SO4 (yellow) |  | safety output is switched off |
| |  1 Hz | restart block, waiting for the start signal to switch on the safety output again |
| |  8 Hz | unlockable error state; waiting for "reset of error condition signal", after receiving the signal the device turns into normal operation |
| |  | safety output is switched on |
|  LED on  LED flashing  LED off | | |

 In case all LEDs are blinking simultaneously in fast rhythm a fatal error has been detected. This message is reset by a short disconnection of the power supply (Power ON Reset).

Accessories:

- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BWU2916)
- ASi substructure module (CNOMO) for 8 channel module in 60 mm housing (art. no. BWU2351)
- Memory Plug, memory capacity 32 kByte (art. no. BW3241)
- Universal protection cap ASi-5/ASi-3 for M12 sockets, IP67 (art. no. BW4056)
- Memory plug cover (art. no. BW3155)
- Sealing profile IP67 (IDC plug), 60 mm (art. no. BW3282)
- Passive Distributor AUX to 1 x M12 cable plug, straight, 4 poles, depth 19 mm, IP67, optimized for load currents ≥ 100 mA (art. no. BWU4725)
- Passive Distributor AUX to 1 x M12 cable plug, straight, 4 poles, depth 19 mm, IP67, optimized for load currents ≤ 100 mA (art. no. BWU4760)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)