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# Analog Modules ASi, IP67, M12

## 2 x 2 connectors for profile cable

## compact housing, IP67

(Figure similar)

| Figure | Type | Inputs analog | Outputs analog | M12 connection | Input voltage (sensor supply) (1) | Output voltage (actuator supply) (2) | ASi connection (3) | ASi address (4) | Art. no. |
|---|---|---|---|---|---|---|---|---|---|
| | IP67, 4 x M12 | 2 x 4 ... 20 mA | – | Signal at pin 2 / pin 4 | out of ASi | – | ASi profile cable | 1 AB slave | **BWU3100** |
| | IP67, 4 x M12 | 2 x 0 ... 10V | – | Signal at pin 2 / pin 4 | out of ASi | – | ASi profile cable | 1 AB slave | **BWU3102** |
| | IP67, 4 x M12 | 2 x Pt100 | – | Signal at pin 1 / pin 3 | out of ASi | – | ASi profile cable | 1 AB slave | **BWU3104** |
| | IP67, 4 x M12 | – | 2 x 0 ... 20 mA | Signal at pin 1 / pin 3 | – | out of AUX | ASi profile cable | 1 single slave | **BWU3105** |
| | IP67, 4 x M12 | – | 2 x 0 ... 20 mA | Signal at pin 2 / pin 4 | – | out of AUX | ASi profile cable | 1 single slave | **BWU3106** |
| | IP67, 4 x M12 | – | 2 x 0 ... 10 V | Signal at pin 1 / pin 3 | – | out of AUX | ASi profile cable | 1 single slave | **BWU3107** |

(1) I**nput voltage (sensor supply):** inputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, inputs shall not be connected to earth or to external potential.

(2) **Output voltage (actuator supply):** outputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, outputs shall not be connected to earth or to external potential

(3) **ASi connection:** the connection to ASi as well to AUX (auxiliary 24 V power) is made via yellow resp. black ASi profile cable with piercing technology or via M12 socket (in IP20 via clamps).

(4) **ASi address:** AB Slave (max. 62 AB Slaves/ASi network), 2 AB Slaves (max. 31 modules with 2 AB Slaves), Single Slaves (max. 31 Single Slaves/ASi network), mixed use allowed.
For modules with two slaves the second slave is turned off as long as the first slave is addressed to address "0".
Upon request, slaves are available with specific ASi Slave profiles.



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# Analog Modules ASi, IP67, M12

| Article No. | BWU3100 | BWU3102 | BWU3104 |
|---|---|---|---|
| **General data** | | | |
| Device type | input | | |
| **Connection** | | | |
| ASi/AUX connection | profile cable and piercing | | |
| Periphery connection | M12,<br>signal at pin 2 / pin 4 | | M12,<br>signal at pin 1 / pin 3 |
| Length of connector cable | I/O: max. 15 m (1) | | |
| **ASi** | | | |
| Profile | S-7.A.9 | | |
| Address | 1 AB slave | | |
| Required Master profile | ≥ M4 | | |
| As of ASi specification | 3.0 | | |
| Operating voltage | 30 $V_{DC}$ (18 ... 31,6 V) | | |
| Max. current consumption | 165 mA | | < 80 mA |
| Max. current consumption without sensor / actuator supply | 45 mA | | < 80 mA |
| **AUX** | | | |
| Operating voltage | – | | |
| Max. current consumption | – | | |
| **Input** | | | |
| Number | 2 | | |
| Resolution | normal: 14 bit,<br>fast: 12 bit | | 14 Bit |
| Range of value | 4000 ... 20000 dec. /<br>0 ... 27648 dec. (2) | 0 ... 10000 dec. /<br>0 ... 27648 dec. (2) | -2000 ... +8500 dec. /<br>-12000 ... 13000 dec |
| Internal resistance | – | 130 kΩ | – |
| Max. voltage drop | < 5 V | – | |
| Max. input voltage | – | 25 V | – |
| Max. input current | 26 mA (internally limited) | – | |
| Power supply | out of ASi | | |
| Power supply of attached sensors | max. 80 mA (max. 120 mA at +40 °C) (3) | | – |
| **Display** | | | |
| LED PWR (green) | on: ASi voltage on<br>flashing: ASi voltage on, but peripheral fault (4) or address 0<br>off: no ASi voltage | | |
| LED FLT/FLAUT (red) | on: no data exchange, slave address 0 or slave offline<br>flashing: peripheral fault (4)<br>off: no ASi voltage | | |
| LED AUX (green) | – | | |
| LED I1, I2 (yellow) | state of channel I1, I2:<br>on: analog signal within range of values<br>flashing: analog signal outside range of values<br>out: channel is switched off | | state of channel I1, I2:<br>on: analog signal within range of values<br>flashing: analog signal outside range of values<br>out: no Pt100 sensor connected |



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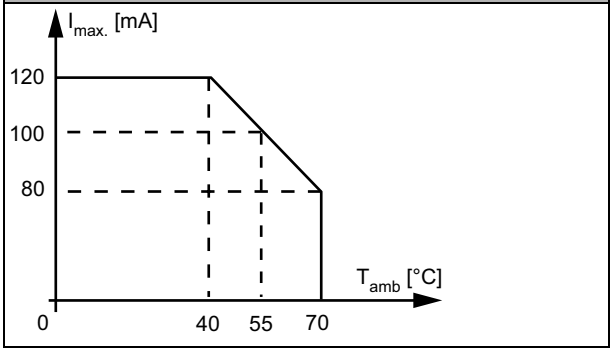
| Article No. | BWU3100 | BWU3102 | BWU3104 |
|---|---|---|---|
| **Environment** | | | |
| Applied standards | EN 61000-6-2<br>EN 61000-6-4<br>EN 60529 | | |
| Can be used in passively safe paths up to SIL3/PLe | yes (5) | | |
| Operating altitude | max. 2000 m | | |
| Ambient temperature | -30 °C … +70 °C (3) | | |
| Storage temperature | -25 °C … +85 °C | | |
| Housing | plastic, for DIN rail mounting or<br>for screw mounting (6) | | |
| Protection category | IP67 | | |
| Maximum tolerable shock and vibration stress | ≤15*g*, T≤11 ms<br>5 ... 500 Hz: 5 Hz, 50 $mm_{pp}$; 7,6 Hz, 50 $mm_{pp}$/6*g*; 500 Hz, 6*g* | | |
| Insulation voltage | ≥500 V | | |
| Weight | 100 g | | |
| Dimensions (W / H / D) in mm | 45 / 80 / 42 | | |

(1) loop resistance: ≤150 Ω

(2) Siemens scale

(3)

**Derating power supply of attached sensors**




(4) **See table "Peripheral fault indication"**

(5) The module is suitable for use in passively safe paths as it has no connection to an AUX potential.

(6) Depending on substructure module (see accessories). The substructure module is not included in the scope of delivery.

| Article No. | BWU3105 | BWU3106 | BWU3107 |
|---|---|---|---|
| **General data** | | | |
| Device type | output | | |
| **Connection** | | | |
| ASi/AUX connection | profile cable and piercing | | |
| Periphery connection | M12,<br>signal at pin 1 / pin 3 | M12,<br>signal at pin 2 / pin 4 | M12,<br>signal at pin 1 / pin 3 |
| Length of connector cable | I/O: max. 15 m (1) | | |
| **ASi** | | | |
| Profile | S-7.3.5 | | |
| Address | 1 single slave | | |
| Required Master profile | ≥M3 | | |
| As of ASi specification | 2.1 | | |
| Operating voltage | 30 $V_{DC}$ (18 ... 31,6 V) | | |
| Max. current consumption | <100 mA | | |
| **AUX** | | | |
| Operating voltage | 24 $V_{DC}$ (18 ... 30 V) | | |
| Max. current consumption | 4 A | | |



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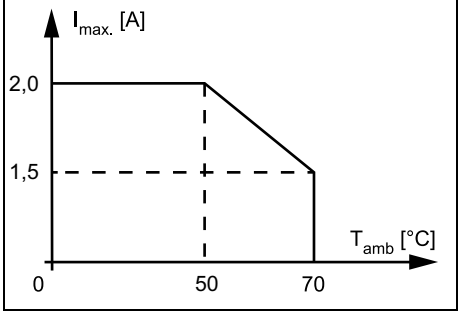
| Article No. | BWU3105 | BWU3106 | BWU3107 |
|---|---|---|---|
| **Output** | | | |
| Number | 2 | | |
| Resolution | 16 Bit (1 µA) | | 16 Bit (1 mV) |
| Range of value | 0 ... 20000 dec. | | 0 ... 10000 dez. |
| Actuator resistance | max. 600 Ω | | min. 3,3 kΩ |
| Max. output voltage | – | | 11,5 V |
| Max. output current | 23 mA | | – |
| Power supply | out of AUX | | |
| Power supply of attached actuators | max. 1,5 A (max. 2 A at +50 °C) per output (2) | | |
| **Display** | | | |
| LED PWR (green) | on: ASi voltage on<br>flashing: ASi voltage on, but peripheral fault (3) or address 0<br>off: no ASi voltage | | |
| LED FLT/FLAUT (red) | on: no data exchange, slave address 0 or slave offline<br>flashing: peripheral fault (3)<br>off: slave online | | |
| LED AUX (green) | on: 24 $V_{DC}$ AUX<br>off: no 24 $V_{DC}$ AUX | | |
| LED O1, O2 (yellow) | state of channel O1, O2:<br>on: analog signal within range of values<br>flashing: analog signal outside range of values | | |
| **Environment** | | | |
| Applied standards | EN 61000-6-2<br>EN 61000-6-4<br>EN 60529 | | |
| Can be used in passively safe paths up to SIL3/PLe | no (4) | | |
| Operating altitude | max. 2000 m | | |
| Ambient temperature | -30 °C … +70 °C (2) | | |
| Storage temperature | -25 °C … +85 °C | | |
| Housing | plastic, for DIN rail mounting or<br>for screw mounting (5) | | |
| Protection category | IP67 | | |
| Maximum tolerable shock and vibration stress | ≤15*g*, T≤11 ms<br>5 ... 500 Hz: 5 Hz, 50 $mm_{pp}$; 7,6 Hz, 50 $mm_{pp}$/6*g*; 500 Hz, 6*g* | | |
| Insulation voltage | ≥500 V | | |
| Weight | 100 g | | |
| Dimensions (W / H / D) in mm | 45 / 80 / 42 | | |

(1) loop resistance: ≤150 Ω

(2)

**Derating actuator supply**




(3) **See table "Peripheral fault indication"**

(4) The module is not suitable for use in passively safe paths because an exclusion of errors cannot be assumed for the connection of the two potentials, ASi and AUX.

(5) Depending on substructure module (see accessories). The substructure module is not included in the scope of delivery.



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| UL-specifications (UL508)<br>BWU3100, BWU3102, BWU3104, BWU3105, BWU3106, BWU3107 | |
|---|---|
| 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. |

| Article No. | Peripheral fault indication | | |
|---|---|---|---|
| | analog signal outside range of values | at least 1 configured channel not connected | overload sensor supply |
| **BWU3100** | • | • | – |
| **BWU3102** | • | – | • |
| **BWU3104** | • (1) | • | – |
| **BWU3105** | • | • | – |
| **BWU3106** | • | • | – |
| **BWU3107** | • | • | – |

(1) no Pt100 sensor connected

## Programming

| | Bit setting | | | |
|---|---|---|---|---|
| | input | | | |
| **Bit** | **P3** | **P2** | **P1** | **P0** |
| BWU3100 | not used (1) | 1: 0V and Sig- internally bridged<br>0: 0V and Sig- not bridged | 1: 4000 ... 20000 dec.<br>0: 0 ... 27648 dec. (2) | 1: peripheral fault is indicated<br>0: peripheral fault is not indicated |
| BWU3102 | | | 1: 0 ... 10000 dec.<br>0: 0 ... 27648 dec. (2) | |
| BWU3104 | | 1: -200 °C ... +850 °C<br>0: -120 °C ... +130 °C | 1: 2 wire mode<br>0: 4 wire mode | |
| | output | | | |
| BWU3105 / BWU3106<br>BWU3107 | not used | 1: peripheral fault is indicated<br>0: peripheral fault is not indicated | not used | 1: Watchdog on<br>0: Watchdog off |

(1) Channel 2 on/off parameterized via ID1.

(2) Siemens scale

| ID1 code | BWU3100 / BWU3102 / BWU3104 |
|---|---|
| 0; 2; 3 | channel 1, 14 bit |
| 1 | channel 1, 12 bit |
| 4; 5; 7 (default) | channel 1 and 2, 14 bit |
| 6 | channel 1 and 2, 12 bit |

## Pin assignment

| Signal name | Explanation |
|---|---|
| Ix | analog input x |
| Ox | analog output x |
| 24 $V_{ext.out}$ | power supply, out of external voltage, positive pole (AUX, actuator supply) |
| 0 $V_{ext.out}$ | power supply, out of external voltage, negative pole (AUX, actuator supply) |
| 24 $V_{out\ of\ ASi}$ | power supply, out of ASi, positive pole (sensor supply) |
| 0 $V_{out\ of\ ASi}$ | power supply, out of ASi, negative pole (sensor supply) |



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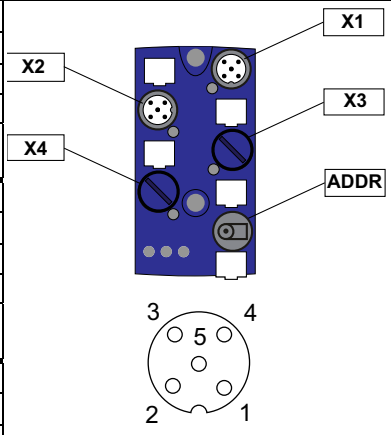
## Connections

| Article No. | M12 connection | Mark | Pin1 | Pin2 | Pin3 | Pin4 | Pin5 |
|---|---|---|---|---|---|---|---|
| BWU3100 BWU3102 | X1 | I1 | $24V_{out\ of\ ASi}$ | Sig+ | $0V_{out\ of\ ASi}$ (1) | Sig- (1) | Shield |
| | X2 | I2 | $24V_{out\ of\ ASi}$ | Sig+ | $0V_{out\ of\ ASi}$ (1) | Sig- (1) | Shield |
| | X3 | not used | | | | | |
| | X4 | not used | | | | | |
| | ADDR (dummy plug) | connection for ASi addressing device | | | | | |
| BWU3104 | X1 | I1 | CH+ | CHS+ | CH- | CHS- | Shield |
| | X2 | I2 | CH+ | CHS+ | CH- | CHS- | Shield |
| | X3 | not used | | | | | |
| | X4 | not used | | | | | |
| | ADDR (dummy plug) | connection for ASi addressing device | | | | | |
| BWU3105 BWU3107 | X1 | O1 | Sig+ | $24V_{ext.out}$ | Sig- | $0V_{ext.out}$ | Shield |
| | X2 | O2 | Sig+ | $24V_{ext.out}$ | Sig- | $0V_{ext.out}$ | Shield |
| | X3 | not used | | | | | |
| | X4 | not used | | | | | |
| | ADDR (dummy plug) | connection for ASi addressing device | | | | | |
| BWU3106 | X1 | O1 | $24V_{ext.out}$ | Sig+ | $0V_{ext.out}$ | Sig- | Shield |
| | X2 | O2 | $24V_{ext.out}$ | Sig+ | $0V_{ext.out}$ | Sig- | Shield |
| | X3 | not used | | | | | |
| | X4 | not used | | | | | |
| | ADDR (dummy plug) | connection for ASi addressing device | | | | | |




(1) Pin 3 and pin 4 bridgeable internally via parameter bit P2.



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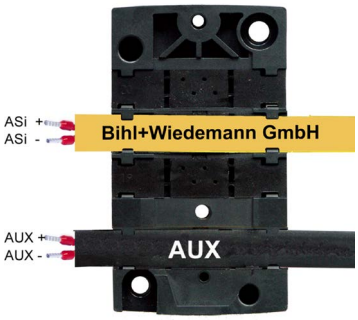
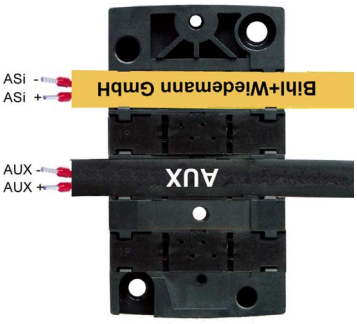
## Mounting according to cable direction

IP67




ordinary

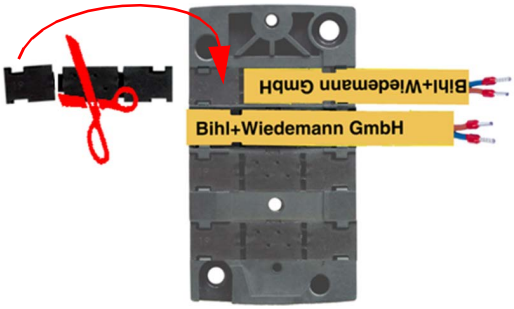


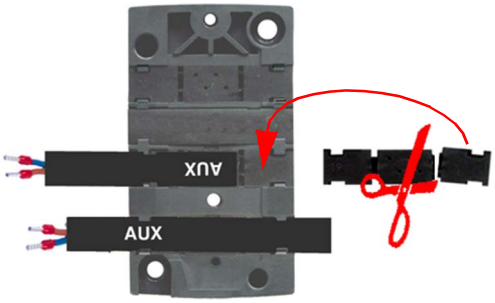

turned

## Line termination with sealing profiles / as junction

IP54

max. 8A




## Accessories:

- **ASi substructure module for 4 channel module in 45 mm housing (art. no. BW2349)**
- **ASi substructure module (CNOMO) for 4 channel module in 45 mm housing (art. no. BW2350)**
- **Protection caps for unused M12 sockets (art. no. BW2368)**
- **Sealing profile IP67 (IDC plug), 45 mm (art. no. BW3283)**



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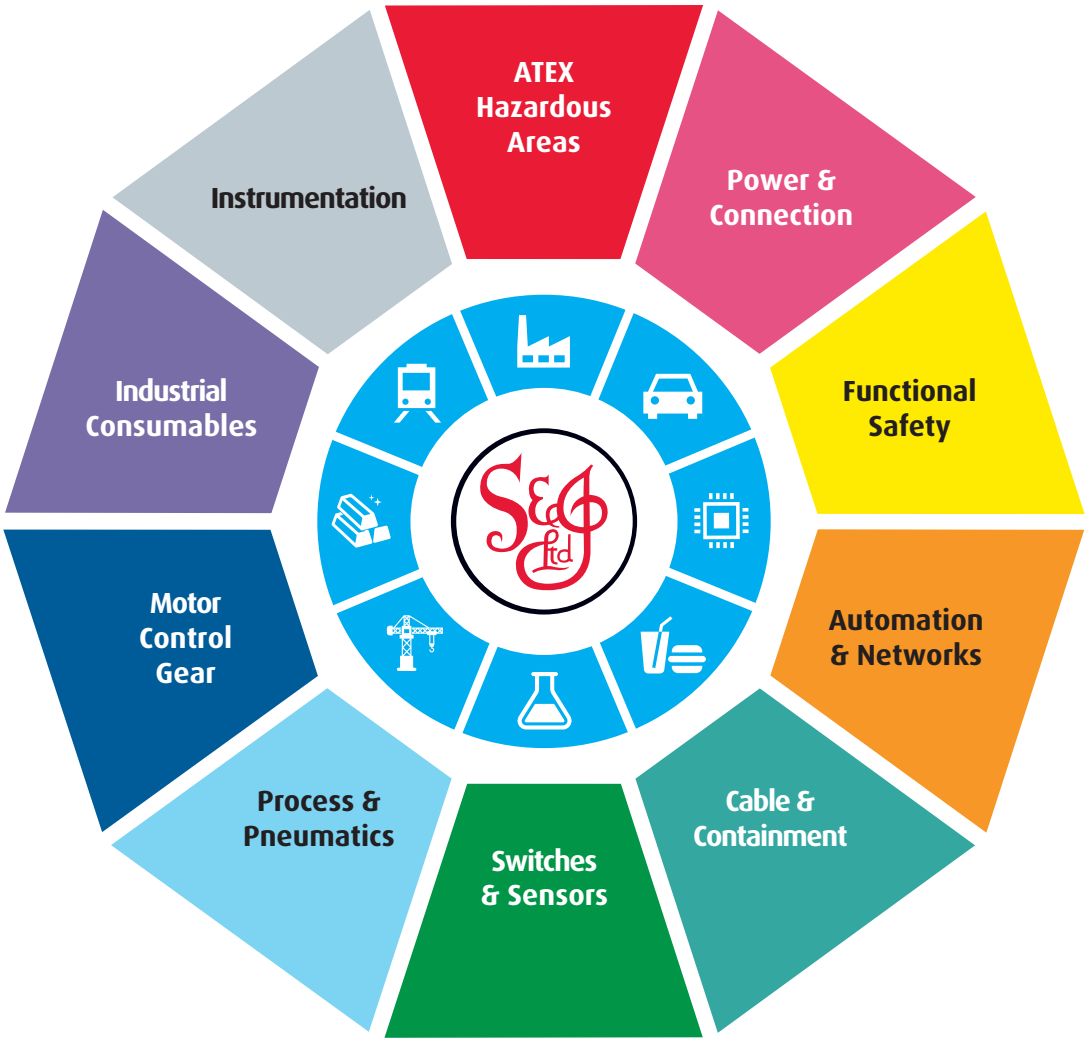


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