

New standard ASi-5

Great data bandwidth, short cycle times

Compatible with slaves of all ASi generations

Counter input module configurable as:

- 4 x 2-channel input
- or
- 4 x 1-channel input

A/B inputs

Impulse counter

High protection category IP67



(Figure similar)



| Figure | Type | Housing | Inputs digital | Range of values | Counting rate | Input voltage (sensor supply) ⁽¹⁾ | ASi connection ⁽²⁾ | ASi address ⁽³⁾ | Article no. |
|--------|----------------------|---------|--------------------|-----------------------------------|-----------------|--|-------------------------------|----------------------------|----------------|
| | IP67, 4 x M12, ASi-5 | 4 x M12 | 4 x counter inputs | impulse: -32768 ... 32767 dec. | max. 250 kHz | out of ASi | ASi via M12 | 1 ASi-5 Slave | BWU4202 |

(1) **Input 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) **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).

(3) **ASi address:** 1 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), ASi-5 Slave (max. 62 ASi-5 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.

| Article No. | BWU4202 |
|--|--------------------------|
| General data | |
| Device type | counter input |
| Connection | |
| ASi connection | M12 ⁽¹⁾ |
| Periphery connection | M12 |
| Length of connector cable | I/O: 20 m ⁽²⁾ |
| ASi | |
| Address | 1 ASi-5 slave |
| Required master profile | M5 |
| Since AS-i specification | 5 |
| Operating voltage | 30 V (18 ... 31.6 V) |
| Max. current consumption | 245 mA |
| Max. current consumption without sensor/ actuator supply | 45 mA |

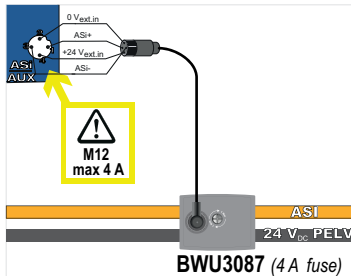
| | | |
|---|---|-----------------------|
| Article No. | | BWU4202 |
| Input | | |
| Number | depending on configuration: 4 x 1-channel 4 x 2-channel | |
| Counting rate | max. 250 kHz | |
| Range of value | impulse: -32768 ... 32767 dec. (start value configurable) | |
| Power supply | out of ASi | |
| Sensor supply | short-circuit and overload protected according to EN 61131-2 | |
| Power supply of attached sensors | up to +40 °C | 200 mA ⁽³⁾ |
| | at +55 °C | 140 mA ⁽³⁾ |
| | at +70 °C | 120 mA ⁽³⁾ |
| Display | | |
| LED ASi (green) | on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽⁴⁾ or address 0 off: no ASi voltage | |
| LED FAULT (red) | on: slave address 0 or slave offline flashing: peripheral fault ⁽⁴⁾ off: slave online | |
| LED C1A ... CnA (yellow) | 1-channel mode on: signal at pulse counter input 1 ... 4 (Pin4) off: no signal | |
| | 2-channel mode with 4-times evaluation on: rising/falling edge at channel A of counter input 1 ... 4 (Pin2) | |
| | 2-channel mode without 4-times evaluation on: period recognized | |
| LED C1B ... CnB (yellow) | 1-channel mode on: status input 1 ... 4 (Pin2) active if bit USE CHx = 1 ⁽⁴⁾ off: status input 1 ... 4 (Pin2) not active if bit USE CHx = 1 ⁽⁴⁾ or bit USE CHx = 0 | |
| | 2-channel mode with 4-times evaluation on: rising/falling edge at channel B of counter input 1 ... 4 (Pin2) | |
| | 2-channel mode without 4-times evaluation no function | |
| Environment | | |
| Applied standards | EN 61000-6-2 EN 61000-6-3 EN 61131-2 EN 60529 | |
| Passive safety (up to PLe/SIL 3) | yes ⁽⁵⁾ | |
| Operating altitude | max. 2000 m | |
| Ambient temperature | -30 °C ... +55 °C (up to max. +70 °C) ⁽³⁾ ⁽⁶⁾ | |
| Storage temperature | -25 °C ... +85 °C | |
| Housing | plastic, for screw mounting | |
| Pollution degree | 2 | |
| Protection category | IP67 | |
| Tolerable loading referring to humidity | acc. 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 | |
| Insulation voltage | ≥ 500 V | |
| Weight | 200 g | |
| Dimensions (W / H / D) in mm | 45 / 80 / 38 (without substructure) | |

(1) **Line protection:**

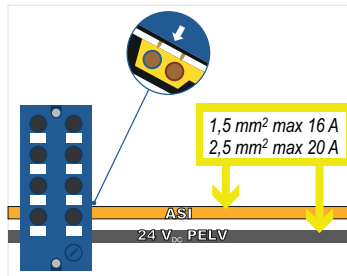
If the module is supplied via a M12 connection with A or B coding, it may only be used with a current load of max. 4 A per pin in acc. with IEC 61076-2-101 and IEC 61076-2-109. A fused tap is recommended. There is no such limitation for modules supplied via piercing contacts.

Connection to ASi and AUX

via M12

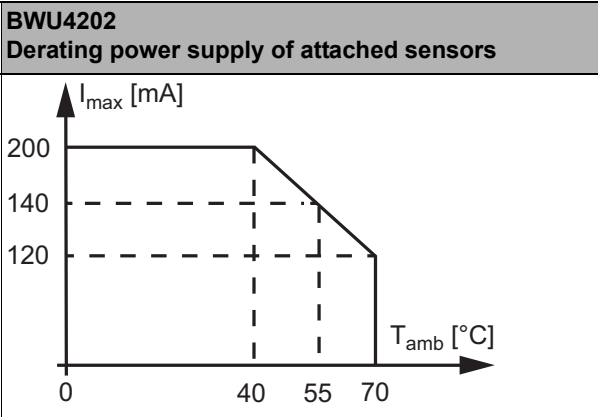


via piercing contacts



(2) Loop resistance $\leq 150 \Omega$

(3)

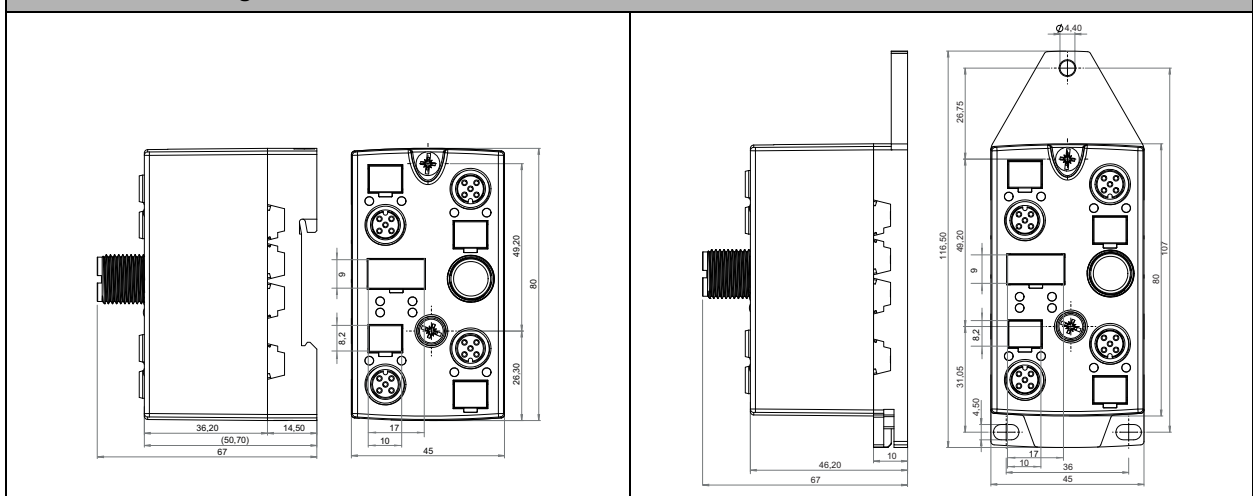


(4) **See table "Peripheral fault indication"**

(5) Exclusion of errors for the connection of the two ASi and AUX potentials can be assumed in the module. Passive safety for the application can only be achieved if this is ensured for all components used.

(6) Maximum ambient operating temperature +55 °C according UL certificate for the use in the USA and Canada

Dimensional drawings



| Article no. | Peripheral fault indication | | |
|-------------|---|-----------------------|---|
| | counter overflow/underflow and RO Chx = 0 | input short circuited | status input (Pin2) in 1-channel mode is not active but bit USE CHx = 1 |
| BWU4202 | • | • | • |

| UL-specifications (UL508) BWU4202 | |
|--------------------------------------|---|
| 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. |

Programming (ASi Bit-setting)

| Article no. | Byte | Bit | | | | | | | |
|-------------|------|------------------------------------|----|----|----|----|----|----|----|
| | | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| | | Input | | | | | | | |
| BWU4202 | 0 | Channel 1 counter value, low byte | | | | | | | |
| | 1 | Channel 1 counter value, high byte | | | | | | | |
| | 2 | Channel 2 counter value, low byte | | | | | | | |
| | 3 | Channel 2 counter value, high byte | | | | | | | |
| | 4 | Channel 3 counter value, low byte | | | | | | | |
| | 5 | Channel 3 counter value, high byte | | | | | | | |
| | 6 | Channel 4 counter value, low byte | | | | | | | |
| | 7 | Channel 4 counter value, high byte | | | | | | | |

| Article no. | Byte | Bit | | | | | | | |
|-------------|------|--|--------|---------|---------|--------|--------|--------|--------|
| | | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| | | Output | | | | | | | |
| BWU4202 | 0 | reserved ⁽¹⁾ | RO Ch1 | USE Ch1 | 4TE Ch1 | 2C Ch1 | CW Ch1 | SV Ch1 | RS Ch1 |
| | 1 | Prescaler Index Ch1 (integer) ⁽²⁾ | | | | | | | |
| | 2 | reserved ⁽¹⁾ | RO Ch2 | USE Ch2 | 4TE Ch2 | 2C Ch2 | CW Ch2 | SV Ch2 | RS Ch2 |
| | 3 | Prescaler Index Ch2 (integer) ⁽²⁾ | | | | | | | |
| | 4 | reserved ⁽¹⁾ | RO Ch3 | USE Ch3 | 4TE Ch3 | 2C Ch3 | CW Ch3 | SV Ch3 | RS Ch3 |
| | 5 | Prescaler Index Ch3 (integer) ⁽²⁾ | | | | | | | |
| | 6 | reserved ⁽¹⁾ | RO Ch4 | USE Ch4 | 4TE Ch4 | 2C Ch4 | CW Ch4 | SV Ch4 | RS Ch4 |
| | 7 | Prescaler Index Ch4 (integer) ⁽²⁾ | | | | | | | |

⁽¹⁾ Reserved bits have to be set to zero, otherwise an timer error could occur.

⁽²⁾ see table "Prescaler Index"

| Name | Explanation |
|---------|--|
| RO Chx | Rollover: 0 = Counter stops at highest/lowest value in case of overflow/underflow 1 = Counter counts with lowest/highest value in case of overflow/underflow |
| USE Chx | use Pin2 channel x 0 = in 1-channel mode (pulse counter) Pin2 is ignored 1 = in 1-channel mode (pulse counter) Pin2 is used as status input |
| 4TE Chx | 4-times evaluation: 0 = no 4-times evaluation 1 = in the 2-channel counting mode (bit 2C CHx = 1) rising and falling edges on both channels are counted separately. |
| 2C Chx | counter mode channel x 0 = 1-channel input counter (pulse counter) 1 = 2-channel input counter (encoder) |
| CW Chx | direction of rotation channel x 1-channel input counter (bit 2C Chx = 0) 0 = counting upwards 1 = counting downwards 2-channel input counter (bit 2C Chx = 1) 0: CxB before CxA = counting upwards 1: CxA before CxB = counting downwards |

| | |
|--------|---|
| SV Chx | start value channel x 0 = start value 0 (default = 0) 1 = start value 1 (default = -32768) |
| RS Chx | reset channel x RS changes from 0 to 1: counter starts with start value 0 resp. start value 1 RS changes from 1 to 0: counter stops and keeps last value |

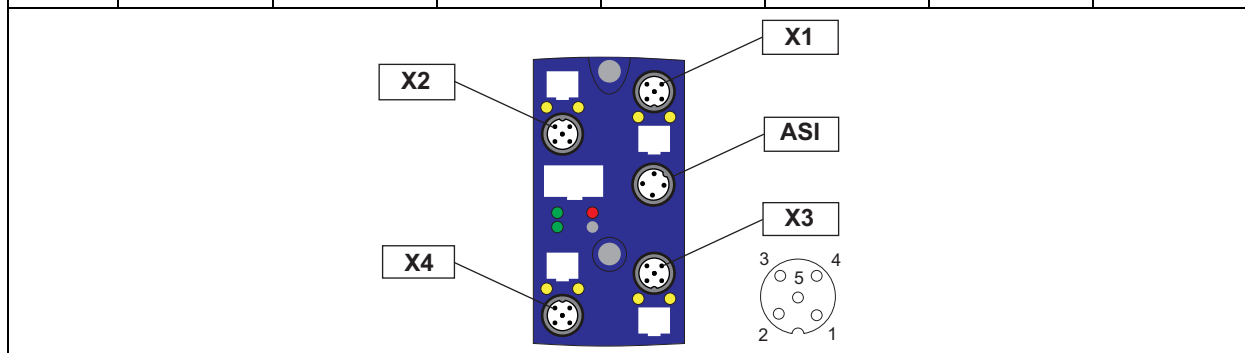
| Article no. | Prescaler Index | | | | | | | | | | | | | | | |
|-------------|-----------------|----------|-----|--|--|--|-----|----|----|----|---|---|---|---|---|---|
| BWU4202 | Index (dec) | 255 | ... | | | | | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | Prescale value | reserved | | | | | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 | | |

Pin assignment

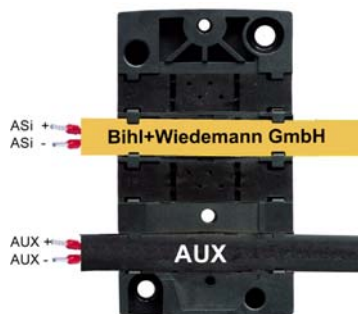
| Signal name | Explanation |
|---------------------------|---|
| C x channel A, B | counter input x channel A, B (2-channel mode) |
| Status x | status input x (1-channel mode) |
| Pulse x+ | pulse counter input x, high rise (1-channel mode) |
| 24V _{out of ASi} | power supply, out of ASi, positive pole (sensor supply) |
| 0V _{out of ASi} | power supply, out of ASi, negative pole (sensor supply) |
| ASi+, ASi- | connection to ASi bus |
| Shield | shield |

Connections

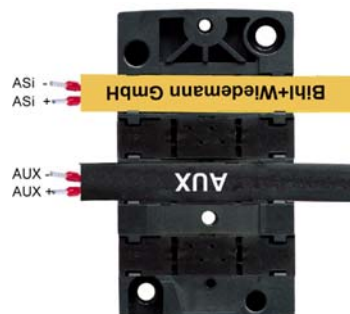
| Article no. | M12 connection | Marking | Pin1 | Pin2 | Pin3 | Pin4 | Pin5 |
|-------------|--|---------|----------------------------|--------------|---------------------------|--------------|------|
| BWU4042 | Configuration as: 4 x 2-channel input | | | | | | |
| | X1 | C1A/C1B | 24 V _{out of ASi} | C1 Channel B | 0 V _{out of ASi} | C1 Channel A | n.c. |
| | X2 | C2A/C2B | 24 V _{out of ASi} | C2 Channel B | 0 V _{out of ASi} | C2 Channel A | n.c. |
| | X3 | C3A/C3B | 24 V _{out of ASi} | C3 Channel B | 0 V _{out of ASi} | C3 Channel A | n.c. |
| | X4 | C4A/C4B | 24 V _{out of ASi} | C4 Channel B | 0 V _{out of ASi} | C4 Channel A | n.c. |
| | ASI | ASI | ASi+ | n.c. | ASi- | n.c. | - |
| | Configuration as: 4 x 1-channel input | | | | | | |
| | X1 | C1A/C1B | 24 V _{out of ASi} | Status 1 | 0 V _{out of ASi} | Pulse 1 + | n.c. |
| | X2 | C2A/C2B | 24 V _{out of ASi} | Status 2 | 0 V _{out of ASi} | Pulse 2 + | n.c. |
| | X3 | C3A/C3B | 24 V _{out of ASi} | Status 3 | 0 V _{out of ASi} | Pulse 3 + | n.c. |
| | X4 | C4A/C4B | 24 V _{out of ASi} | Status 4 | 0 V _{out of ASi} | Pulse 4 + | n.c. |
| | ASI | ASI | ASi+ | n.c. | ASi- | n.c. | - |



Mounting according to cable direction

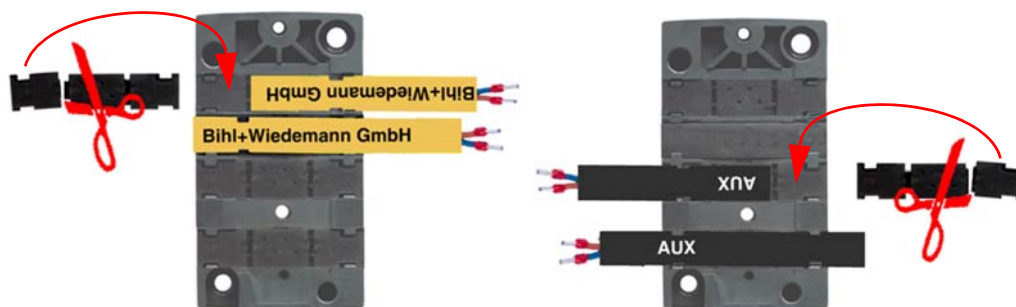
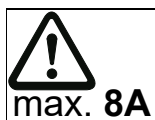


ordinary



turned

Line termination with sealing profiles / as junction



Accessories:

- Protection caps for unused M12 sockets (art. no. BW2368)
- Passive Distributor ASI/AUX to 2 x M12 socket, internal protection via changeable 4 A slow-blow fuses (art. no. BWU3087)
- It is recommended to use pre-assembled cables to connect the power source with the module.