

ASi-5 – Great data bandwidth, short cycle times

4 x counter inputs, individually configurable and parameterizable via ASIMON360 as:

- 4 x 2-channel input or
- 4 x 1-channel input or
- up to 8 digital inputs
- up to 8 digital outputs

A/B inputs

Frequency and period duration measurement with and without filtering

Unused counter inputs can also be used as standard inputs or outputs

Impulse counter and Encoder (24 V)

Time stamp

Protection category IP20



(figure similar)



| Figure | Type | Inputs digital | Range of values | Counting rate | Input voltage (sensor supply) (1) | Output voltage (actuator supply) (2) | ASi connection (3) | ASi address (4) | Article no. |
|--------|--|--------------------|---|---------------|-----------------------------------|--------------------------------------|--------------------|-----------------|----------------|
| | IP20, 22,5 mm x 114 mm, 6 x 4 contacts ASi-5 | 4 x counter inputs | impulse: -2147483647... 2147483647 dec. | max. 250 kHz | out of AUX | out of AUX | Push-in terminals | 1 ASi-5 address | BWU4276 |

(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) **Output voltage (actuator supply):** Outputs 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.

(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 addresses (max. 62 AB addresses/ASi network), 2 AB addresses (max. 31 modules with 2 AB addresses), Single addresses (max. 31 Single addresses/ASi network), ASi-5 address (max. 62 ASi-5 addresses/ASi network), mixed use allowed. Upon request, ASi-3 nodes are available with specific ASi node profiles. For modules with two ASi-3 nodes the 2nd ASi-3 node is turned off as long as the 1st ASi-3 node is addressed to address "0".

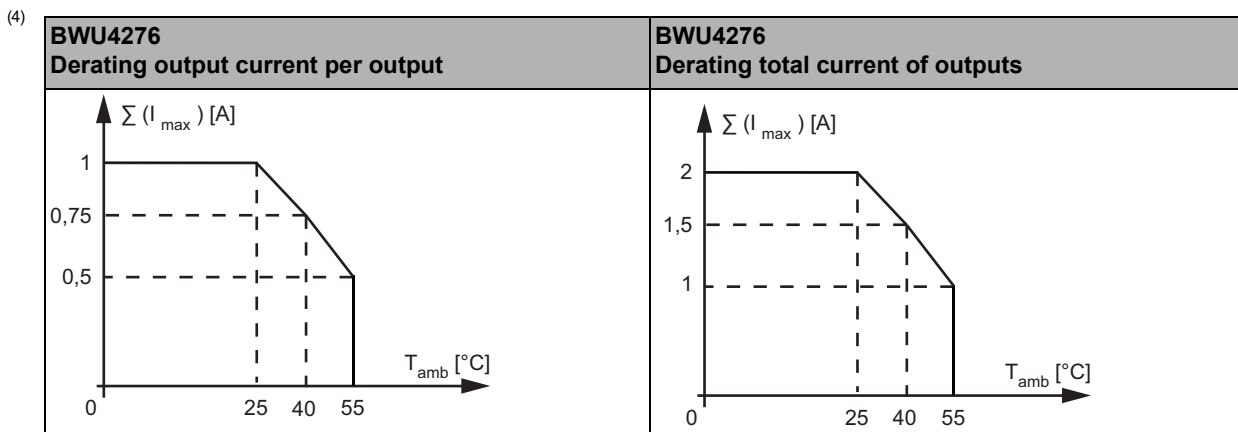
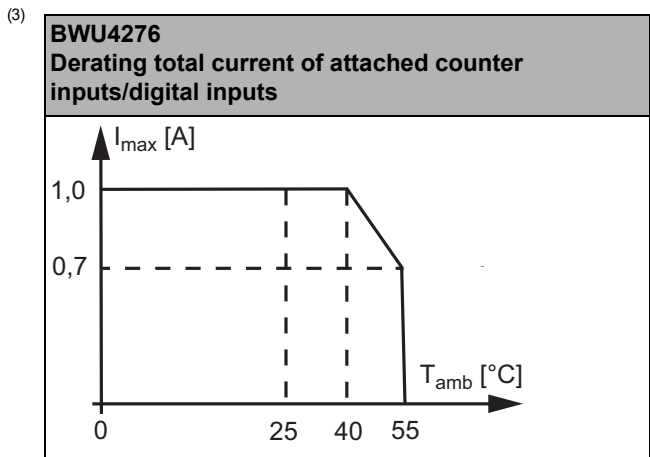
| | |
|---------------------------|-------------------------------|
| Article no. | BWU4276 |
| General data | |
| Device type | input/output |
| Connection | |
| ASi/AUX connection | Push-in terminals |
| Periphery connection | Push-in terminals |
| Primary application | decentralized control cabinet |
| Length of connector cable | I/O: 20 m (1) |

| | | |
|--|--------------|---|
| Article no. | | BWU4276 |
| ASi | | |
| Address | | 1 ASi-5 address |
| As of ASi specification | | ASi-5 |
| ASi process data width | | 8 byte ⁽²⁾ |
| Operating voltage | | 30 V (18 ... 31,6 V) |
| Max. current consumption | | 60 mA |
| Max. current consumption without sensor/ actuator supply | | 60 mA |
| AUX | | |
| Operating voltage | | 24 V (18 ... 30 V) |
| Max. current consumption | | 4 A |
| Counter input | | |
| Number | | depending on configuration in ASIMON360: • 4 x 1-channel • 4 x 2-channel |
| Range of values | | -2147483647 ... 2147483647 dec. (start value: -2147483647) |
| Counting rate | | max. 250 kHz |
| Power supply | | out of AUX |
| Sensor supply | | short-circuit and overload protected according to EN 61131-2 |
| Power supply of attached sensors | up to +25 °C | $\Sigma(\text{Counter/In}) 1 \text{ A}^{(3)}$ |
| | at +40 °C | $\Sigma(\text{Counter/In}) 1 \text{ A}^{(3)}$ |
| | at +55 °C | $\Sigma(\text{Counter/In}) 0,7 \text{ A}^{(3)}$ |
| Switching threshold | | U < 5 V (low) U > 15 V (high) |
| Impulse Counter and Encoder (24V) | | The required input signal level is < 5V for a low-signal and > 15V for a high signal. |
| Input | | |
| Number | | up to 8, depending on configuration |
| Power supply | | out of AUX |
| Sensor supply | | short-circuit and overload protected according to EN 61131-2 |
| max. current for sensor supply via the device (I+) | up to +25 °C | $\Sigma(\text{Counter/In}) 1 \text{ A}^{(3)}$ |
| | at +40 °C | $\Sigma(\text{Counter/In}) 1 \text{ A}^{(3)}$ |
| | at +55 °C | $\Sigma(\text{Counter/In}) 0,7 \text{ A}^{(3)}$ |
| Switching threshold | | U < 5 V (low) U > 15 V (high) |
| Output | | |
| Number | | up to 8 x electronic, depending on configuration |
| Power supply | | out of AUX |
| Output | | short-circuit and overload protected according to EN 61131-2 |
| Max. output current | up to +25 °C | max. 1000 mA per output, $\Sigma(\text{O1 ... O4}) 1000 \text{ mA}+$ $\Sigma(\text{O5 ... O8}) 1000 \text{ mA}^{(4)}$ $\Sigma(\text{O1 ... O8}) 2000 \text{ mA}^{(4)}$ |
| | at +40 °C | max. 750 mA per output, $\Sigma(\text{O1 ... O4}) 750 \text{ mA}+$ $\Sigma(\text{O5 ... O8}) 750 \text{ mA}^{(4)}$ $\Sigma(\text{O1 ... O8}) 1500 \text{ mA}^{(4)}$ |
| | at +55 °C | max. 500 mA per output, $\Sigma(\text{O1 ... O4}) 500 \text{ mA}+$ $\Sigma(\text{O5 ... O8}) 500 \text{ mA}^{(4)}$ $\Sigma(\text{O1 ... O8}) 1000 \text{ mA}^{(4)}$ |

| | |
|--|--|
| Article no. | BWU4276 |
| Display | |
| LED ASi (green) | on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽⁵⁾ or address 0 off: no ASi voltage |
| LED FAULT (red) | on: ASi address 0 or ASi participant offline flashing: peripheral fault ⁽⁵⁾ off: ASi participant online |
| LED AUX (green) | on: 24 VDC AUX off: no 24 VDC AUX |
| LED C1A ... CnA (yellow) | 1-channel mode on: signal at pulse counter input 1 ... 4 (clamp C1A ... C4A) off: no signal |
| | 2-channel mode with 4-times evaluation on: rising/falling edge at channel A of counter input 1 ... 4 (clamp C1A ... C4A) |
| | 2-channel mode without 4-times evaluation on: period recognized |
| | Status of inputs I1, I3, I5, I7 or outputs O1, O3, O5, O7 depending on the configuration Off: the corresponding input or output is off Yellow: the corresponding input or output is on red flashing: output short circuit ⁽⁵⁾ at (at least) one output (indication has priority over "overload sensor supply") red: overload sensor supply ⁽⁵⁾ (if "output short circuit" occurs at the same time, the "red flashing" indication at the corresponding LED has priority) |
| LED C1B ... CnB (yellow) | 1-channel mode on: status input 1 ... 4 (clamp C1B ... C4B) active if bit USE CHx = 1 ⁽⁵⁾ off: status input 1 ... 4 (clamp C1B ... C4B) not active if bit USE CHx = 1 ⁽⁵⁾ or bit USE CHx = 0 |
| | 2-channel mode with 4-times evaluation on: rising/falling edge at channel B of counter input 1 ... 4 (clamp C1B ... C4B) |
| | 2-channel mode without 4-times evaluation no function |
| | Status of inputs I2, I4, I6, I8 or outputs O2, O4, O6, O8 depending on the configuration Off: the corresponding input or output is off Yellow: the corresponding input or output is on red flashing: output short circuit ⁽⁵⁾ at (at least) one output (indication has priority over "overload sensor supply") red: overload sensor supply ⁽⁵⁾ (if "output short circuit" occurs at the same time, the "red flashing" indication at the corresponding LED has priority) |
| Environment | |
| Applied standards | EN 61000-6-2 EN 61000-6-3 EN 61131 EN 60529 |
| It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe | yes ⁽⁶⁾ |
| Operating altitude | max. 2000 m |
| Ambient temperature | -25 °C ... +55 °C ⁽³⁾ |
| | no condensation permitted |
| Storage temperature | -25°C ... +85°C |
| Housing | plastic, for DIN rail mounting |
| Pollution degree | 2 |
| Protection category | IP20 |
| Tolerable loading referring to humidity | according to EN 61131-2 |
| Insulation voltage | ≥500 V |
| Weight | 120 g |
| Dimensions (W / H / D) in mm | 22,5 / 99,6 / 114 |

⁽¹⁾ Loop resistance ≤150 Ω

(2) The ASi-5 process data bandwidth depends on the ASi-5 profile. Further selectable profiles can be found in the hardware catalog of the Bihl+Wiedemann Suite or in the configuration manual.



(5) See table "Peripheral fault indication"

(6) 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.

Wiring rules

| Push-in terminals, 2 /3 /4 poles (pitch 5 mm) | |
|--|--|
| General | |
| Nominal cross section | 2.5 mm ² |
| Conductor cross section | |
| Conductor cross section solid | 0.2 ... 2.5 mm ² |
| Conductor cross section flexible | 0.2 ... 2.5 mm ² |
| Conductor cross section flexible, with ferrule | without plastic sleeve: 0.25 ... 2.5 mm ² |
| | with plastic sleeve: 0.25 ... 2.5 mm ² |
| 2 conductors with same cross section, stranded, with TWIN ferrules | without plastic sleeve: 0.5 ... 1.5 mm ² |
| AWG | 24 ... 14 |
| Stripped insulation length | 10 mm |

| 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. |

| 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 | Output short circuited |
| BWU4276 | • | • | • | • |

Programming (ASi Bit setting) standard profile - factory default setting

| Article no. | Byte | Bit | | | | | | | |
|-------------|------|------------------------------------|----|----|----|----|----|----|----|
| | | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
| | | Input | | | | | | | |
| BWU4276 | 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 | | | | | | | |
| BWU4276 | 0 | reserved ⁽¹⁾ | RO Ch1 | USE Ch1 | 4TE Ch1 | 2C Ch1 | CW Ch1 | SV Ch1 | RS Ch1 |
| | 1 | Prescaler Index Ch1 (decimal) ⁽²⁾ | | | | | | | |
| | 2 | reserved ⁽¹⁾ | RO Ch2 | USE Ch2 | 4TE Ch2 | 2C Ch2 | CW Ch2 | SV Ch2 | RS Ch2 |
| | 3 | Prescaler Index Ch2 (decimal) ⁽²⁾ | | | | | | | |
| | 4 | reserved ⁽¹⁾ | RO Ch3 | USE Ch3 | 4TE Ch3 | 2C Ch3 | CW Ch3 | SV Ch3 | RS Ch3 |
| | 5 | Prescaler Index Ch3 (decimal) ⁽²⁾ | | | | | | | |
| | 6 | reserved ⁽¹⁾ | RO Ch4 | USE Ch4 | 4TE Ch4 | 2C Ch4 | CW Ch4 | SV Ch4 | RS Ch4 |
| | 7 | Prescaler Index Ch4 (decimal) ⁽²⁾ | | | | | | | |

⁽¹⁾ Reserved bits have to be set to zero, otherwise an timer error can 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 CxB channel x 0 = in 1-channel mode (pulse counter) CxB is ignored 1 = in 1-channel mode (pulse counter) CxB 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: CxB before CxA = counting downwards |
| SV Chx | start value channel x 0 = start value 0 (default = 0) 1 = start value 1 (default = -2147483647) |
| 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 |

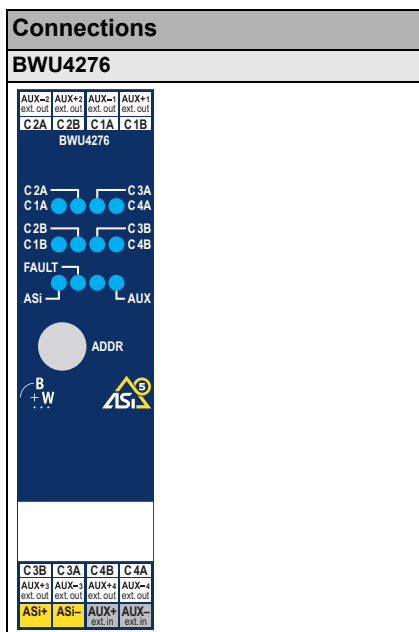
| Article no. | Prescaler Index | | | | | | | | | | | |
|-------------|-----------------|----------|-----|---|-----|----|----|----|---|---|---|---|
| BWU4276 | Index (dec) | 255 | ... | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| | Prescale value | reserved | | | 128 | 64 | 32 | 16 | 8 | 4 | 2 | 1 |

Notice

For information on the process and parameter data of the extended profile (available from Ident. No. =18955), please refer to the configuration manual of the counter modules.

Connections

| Signal name | Explanation |
|---------------------------|--|
| CxA | <ul style="list-style-type: none"> 2-channel mode: input signal x channel A 1-channel mode: pulse counter input x, high rise |
| CxB | <ul style="list-style-type: none"> 2-channel mode: input signal x channel B 1-channel mode: status input x |
| AUX+ _{x ext.out} | <ul style="list-style-type: none"> power supply of counter input, out of external 24 V voltage, positive pole sensor supply of digital input, out of external 24 V voltage |
| AUX- _{x ext.out} | <ul style="list-style-type: none"> power supply of counter input, out of external 24 V voltage, positive pole Reference potential for digital outputs (PNP) |
| ASi+, ASi- | connection to ASi bus |
| AUX + _{ext.in} | power supply, out of external voltage, positive pole (AUX) |
| AUX - _{ext.in} | power supply, out of external voltage, negative pole (AUX) |
| ADDR | connection for ASi addressing device |
| n.c. (not connected) | not connected |



| | |
|-----------------|--|
| IP54 | Note |
| | To achieve passive safety, the device must be installed in a switching cabinet with protection class IP54. |

Accessories:

- Bihl+Wiedemann Suite, Set consisting of ASi Control Tools360 and diagnostics software (Article no. BW2902)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)