ASi-5 Counter Module, IP67, M12

Bihl + Wiedemann

ASi-5 – Great data bandwidth, short cycle times

4 x counter inputs, individually configurable and parameterizable as:
- **4 x 2-channel input**

or

- **4 x 1-channel input**

A/B inputs

Frequency and period duration measurement with and without filtering

Impulse counter and Encoder (24 V)

High protection category IP67

(Figure similar)

Figure	Housing	Inputs digital	Range of values [1]	Counting rate	Input voltage (sensor supply) [2]	ASi connection [3]	ASi address [4]	Article no.
	4 x M12	4 x counter inputs	impulse: -2147483647 ... 2147483647 dec.	max. 250 kHz	out of ASi	ASi via M12	1 ASi-5 address	**BWU4202**

[1] From Ident. No. ≥18955, for Ident. No. <18955 range of values -32768 ... 32767 dec.

[2] **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.

[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.	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 address
Required master profile	M5
Since ASi specification	5
ASi process data width	8 byte [3]
Operating voltage	30 V (18 … 31.6 V)
Max. current consumption	245 mA
Max. current consumption without sensor/ actuator supply	45 mA

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ASi-5 Counter Module, IP67, M12

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: -2147483647 ... 2147483647 dec. (start value configurable) [4]	
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 [5]
	at +55 °C	140 mA [5]
	at +70 °C	120 mA [5]
Impluse counter and Encoder (24 V)	The required input signal level is < 5V for a low-signal and > 15V for a high signal.	
Display		
LED ASi (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault [6] or address 0 off: no ASi voltage	
LED FAULT (red)	on: ASi address 0 or ASi participant offline flashing: peripheral fault [6] off: ASi participant 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 [6] off: status input 1 ... 4 (Pin2) not active if bit USE CHx = 1 [6] 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	
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	yes [7]	
Operating altitude	max. 2000 m	
Ambient temperature	-30 °C … +55 °C (up to max. +70 °C) [5] [8]	
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 / 117 / 57	

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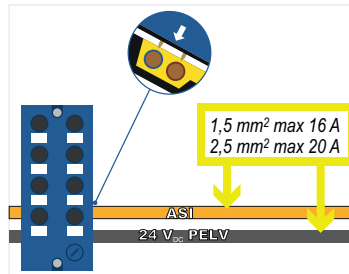
[1] **Line protection:**
If the module is supplied via a M12 connection with A or B coding, it may only be used with a current load of max. 4 A per pin in acc. with IEC 61076-2-101 and IEC 61076-2-109. A fused tap is recommended. There is no such limitation for modules supplied via piercing contacts.

**Connection to ASi and AUX
via M12**
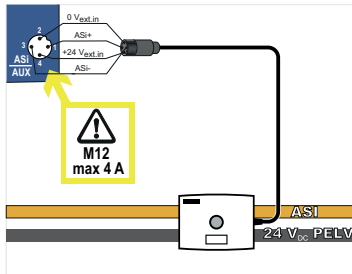
via piercing contacts

[2] Loop resistance ≤150 Ω

[3] 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.

[4] From Ident. No. ≥18955, for Ident. No. <18955 range of values -32768 ... 32767 dec.

[5]
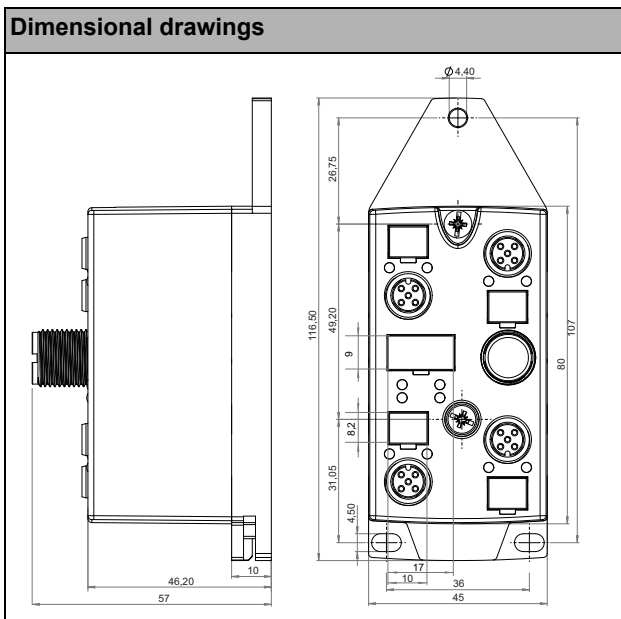
**BWU4202
Derating power supply of attached sensors**
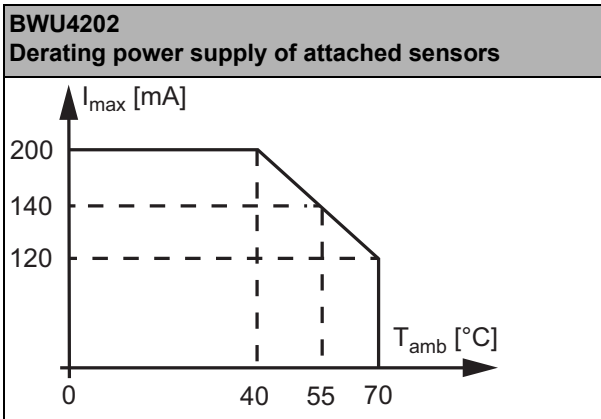
[6] **See table "Peripheral fault indication"**

[7] The module is suitable for use in passively safe paths as it has no connection to an AUX potential.

[8] 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 ≤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) standard profile - factory default 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"

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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: 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	

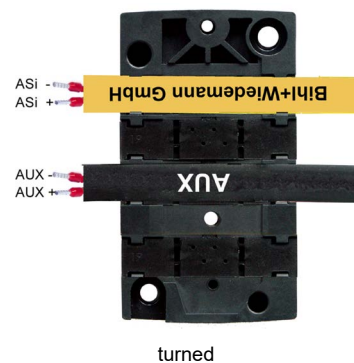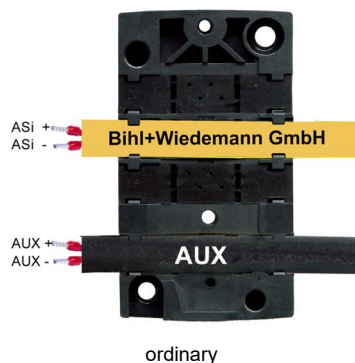| Article no.	Prescaler Index												
BWU4202	Index (dec)	255	...		8	7	6	5	4	3	2	1	0
	Prescale value		reserved			128	64	32	16	8	4	2	1

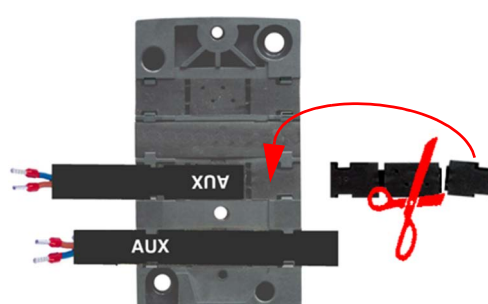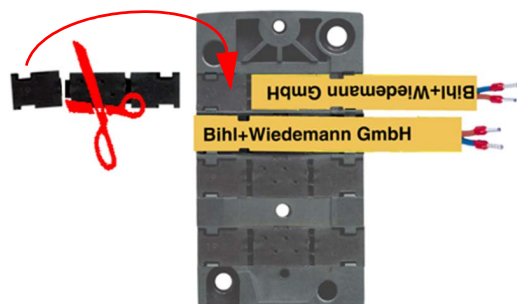| Notice |
|---|
| For information on the process and parameter data of the extended profile (available from Ident. No. =18955), please refer to the configuration manual of the counter modules. |

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$_{\text{out of ASi}}$	power supply, out of ASi, positive pole (sensor supply)
0V$_{\text{out of ASi}}$	power supply, out of ASi, negative pole (sensor supply)
ASi+, ASi-	connection to ASi bus
Shield	shield

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Connections

Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU4202	**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

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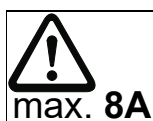
Accessories:

- **Universal protection cap ASi-5/ASi-3 for M12 sockets, IP67 (art. no. BW4056)**
- **Passive Distributor ASi to 1 x M12 cable socket, angled, 5 poles, depth 19 mm, IP67 (art. no. BWU3185)**
- **Passive Distributor ASi to 1 x M12 cable socket, straight, 5 poles, depth 19 mm, IP67 (art. no. BWU3247)**
- **ASi-5/ASi-3 Address Programming Device (art. no. BW4925)**
- **It is recommended to use pre-assembled cables to connect the power source with the module.**

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