ASi-5 Counter Module, IP67, M12

Bihl + Wiedemann

ASi-5 – Great data bandwidth, short cycle times

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

or

- **2 x 1-channel input**

A/B inputs

Frequency and period duration measurement with and without filtering

Unused counter inputs can also be used as standard inputs

Impulse counter and Encoder (24 V)

High protection category IP67

(Figure similar)

Figure	Housing	Inputs digital	Range of values	Counting rate	Input voltage (sensor supply) [1]	ASi connection [2]	ASi address [3]	Article no.
	IP67, depth: 35 mm	2 x counter inputs	impulse: -2147483647 ... 2147483647 dec.	max. 250 kHz	out of ASi	ASi profile cable	1 ASi-5 address	**BWU4996**

[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:** 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 no-de 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".

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Article No.	BWU4996
General data	
Device type	counter input
Connection	
ASi connection	profile cable and piercing technology
Periphery connection	2 x M12 cable socket, straight, 5 poles
Cable	1 m
	max. allowed tensile strain 10 N
ASi	
Address	1 ASi-5 address
Required master profile	M5
Since ASi specification	5
ASi process data width	4 byte [1]
Operating voltage	30 V (18 … 31.6 V)
Max. current consumption	250 mA
Max. current consumption without sensor/ actuator supply	50 mA
Input	

Number	depending on configuration:
	   2 x 1-channel
	   2 x 2-channel

Counting rate	max. 250 kHz
Range of value	impulse: -2147483647 ... 2147483647 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 [2]
	at +55 °C	200 mA [2]
	at +70 °C	140 mA [2]

Display	
LED ASi (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault [3] or address 0 off: no ASi voltage
LED FAULT (red)	on: ASi address 0 or ASi node offline flashing: peripheral fault [3] off: ASi node online

LED C1A, C2A (yellow)	**1-channel mode**
	   on: signal at pulse counter input 1, 2 (Pin4)
	   off: no signal

	2-channel mode with 4-times evaluation on: rising/falling edge at channel A of counter input 1, 2 (Pin4)
	2-channel mode without 4-times evaluation on: period recognized

LED C1B, C2B (yellow)	**1-channel mode**
	   on: status input 1, 2 (Pin2) active if bit USE CHx = 1 [3]
	   off: status input 1, 2 (Pin2) not active if bit USE CHx = 1 [3] or bit USE CHx = 0

	2-channel mode with 4-times evaluation on: rising/falling edge at channel B of counter input 1, 2 (Pin2)
	2-channel mode without 4-times evaluation no function

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Article No.	BWU4996
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 [4]
Operating altitude	max. 2000 m
Ambient temperature	-30 °C … +55 °C (up to max. +70 °C) [2] [5]
Storage temperature	-25 °C … +85 °C
Housing	plastic, for screw mounting, suitable for cable ducts (≥35 mm installation depth)
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	60 / 45 / 35

[1] 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.

[2]

BWU4996
Derating power supply of attached sensors
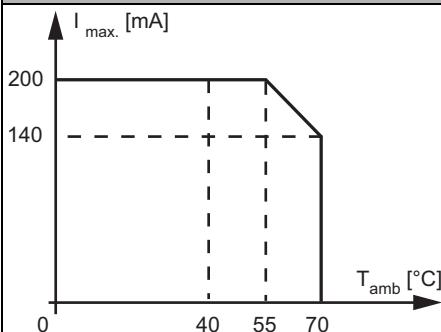
[3] **See table "Peripheral fault indication"**

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

[5] Maximum ambient operating temperature +55 °C according UL certificate for the use in the USA and Canada

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Dimensional drawings
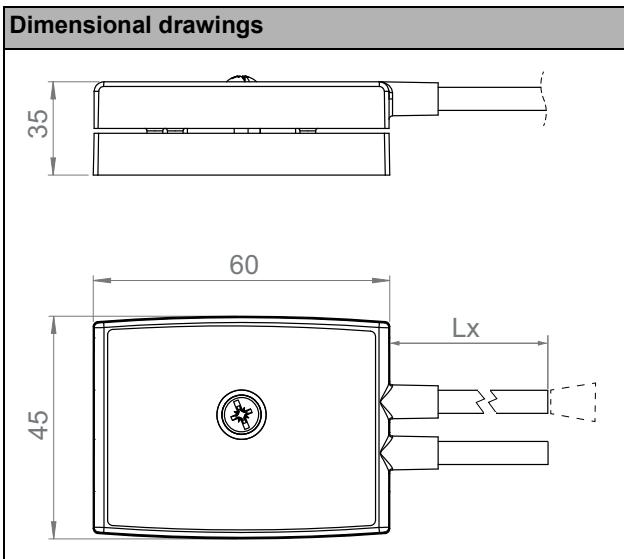
Article no.	Peripheral fault indication		
	counter overflow/underflow and RO Chx = 0	overload sensor supply	status input (Pin2) in 1-channel mode is not active but bit USE CHx = 1
BWU4996	●	●	●

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

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		Input							
BWU4996	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							

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		Output							
BWU4996	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]							

[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											
BWU4996	**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$_{\text{out of ASi}}$	power supply, out of ASi, positive pole (sensor supply)
0V$_{\text{out of ASi}}$	power supply, out of ASi, negative pole (sensor supply)
Shield	shield

Connections							
Article no.	**M12 connection**	**Marking**	**Pin1**	**Pin2**	**Pin3**	**Pin4**	**Pin5**
	Configuration as: 2 x 2-channel input						
BWU4996	**X1**	C1A/C1B	24 V$_{\text{out of ASi}}$	C1 Channel B	0 V$_{\text{out of ASi}}$	C1 Channel A	n.c.
	X2	C2A/C2B	24 V$_{\text{out of ASi}}$	C2 Channel B	0 V$_{\text{out of ASi}}$	C2 Channel A	n.c.
	Configuration as: 2 x 1-channel input						
	X1	C1A/C1B	24 V$_{\text{out of ASi}}$	Status 1	0 V$_{\text{out of ASi}}$	Pulse 1 +	n.c.
	X2	C2A/C2B	24 V$_{\text{out of ASi}}$	Status 2	0 V$_{\text{out of ASi}}$	Pulse 2 +	n.c.
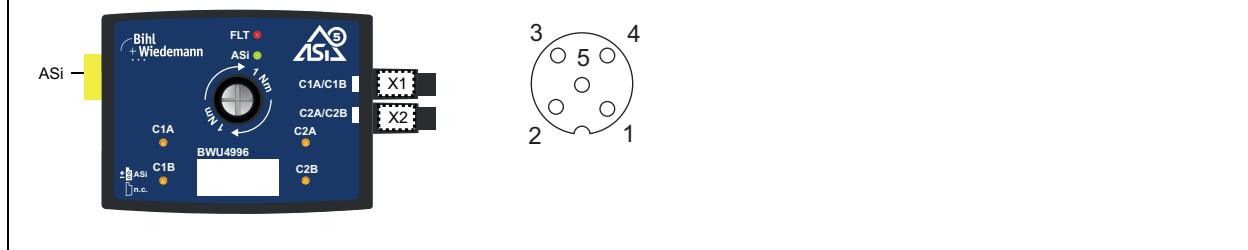
Line termination with sealing profiles

max. IP54
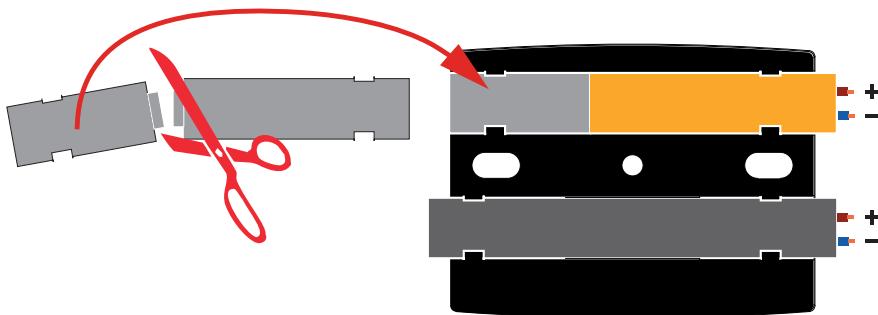
Accessories:
- **Sealing profile IP67 (IDC plug), 60 mm (art. no. BW3282)**
- **ASi-5/ASi-3 Address Programming Device (art. no. BW4925)**

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