

# ASi-5 Counter Module, IP67, M12

## New standard ASi-5

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) <sup>(1)</sup>	ASi connection <sup>(2)</sup>	ASi address <sup>(3)</sup>	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 profile cable	1 ASi-5 address	<b>BWU4042</b>

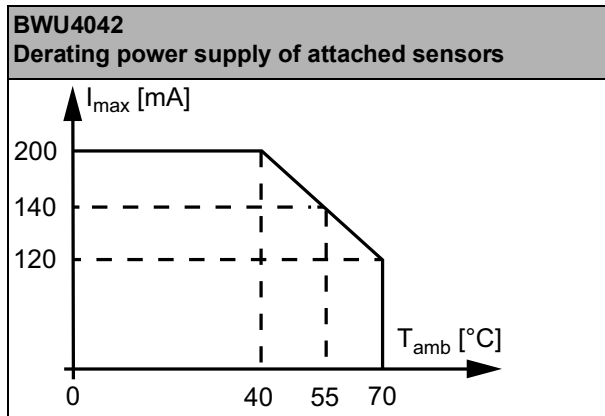
- (1) **Input voltage (sensor supply):** Inputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, inputs shall not be connected to earth or to external potential.
- (2) **ASi connection:** The connection to ASi as well to AUX (auxiliary 24 V power) is made via yellow resp. black 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".

<b>Article No.</b>		<b>BWU4042</b>
<b>General data</b>		
Device type	counter input	
<b>Connection</b>		
ASi connection	profile cable and piercing	
Periphery connection	M12	
Length of connector cable	I/O: 20 m <sup>(1)</sup>	
<b>ASi</b>		
Address	1 ASi-5 address	
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	
<b>Input</b>		
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 <sup>(2)</sup>
	at +55 °C	140 mA <sup>(2)</sup>
	at +70 °C	120 mA <sup>(2)</sup>
<b>Display</b>		
LED ASi (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault <sup>(3)</sup> or address 0 off: no ASi voltage	
LED FAULT (red)	on: ASi address 0 or ASi participant offline flashing: peripheral fault <sup>(3)</sup> off: ASi participant online	
LED C1A ... CnA (yellow)	<b>1-channel mode</b> on: signal at pulse counter input 1 ... 4 (Pin4) off: no signal	
	<b>2-channel mode with 4-times evaluation</b> on: rising/falling edge at channel A of counter input 1 ... 4 (Pin2)	
	<b>2-channel mode without 4-times evaluation</b> on: period recognized	
LED C1B ... CnB (yellow)	<b>1-channel mode</b> on: status input 1 ... 4 (Pin2) active if bit USE CHx = 1 <sup>(3)</sup> off: status input 1 ... 4 (Pin2) not active if bit USE CHx = 1 <sup>(3)</sup> or bit USE CHx = 0	
	<b>2-channel mode with 4-times evaluation</b> on: rising/falling edge at channel B of counter input 1 ... 4 (Pin2)	
	<b>2-channel mode without 4-times evaluation</b> no function	

<b>Article No.</b>	<b>BWU4042</b>
<b>Environment</b>	
Applied standards	EN 61000-6-2 EN 61000-6-3 EN 61131-2 EN 60529
Can be used in passively safe paths up to SIL3/PLe	yes <sup>(4)</sup>
Operating altitude	max. 2000 m
Ambient temperature	-30 °C ... +55 °C (up to max. +70 °C) <sup>(2)</sup> <sup>(5)</sup>
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 <sub>pp</sub> /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) Loop resistance ≤ 150 Ω

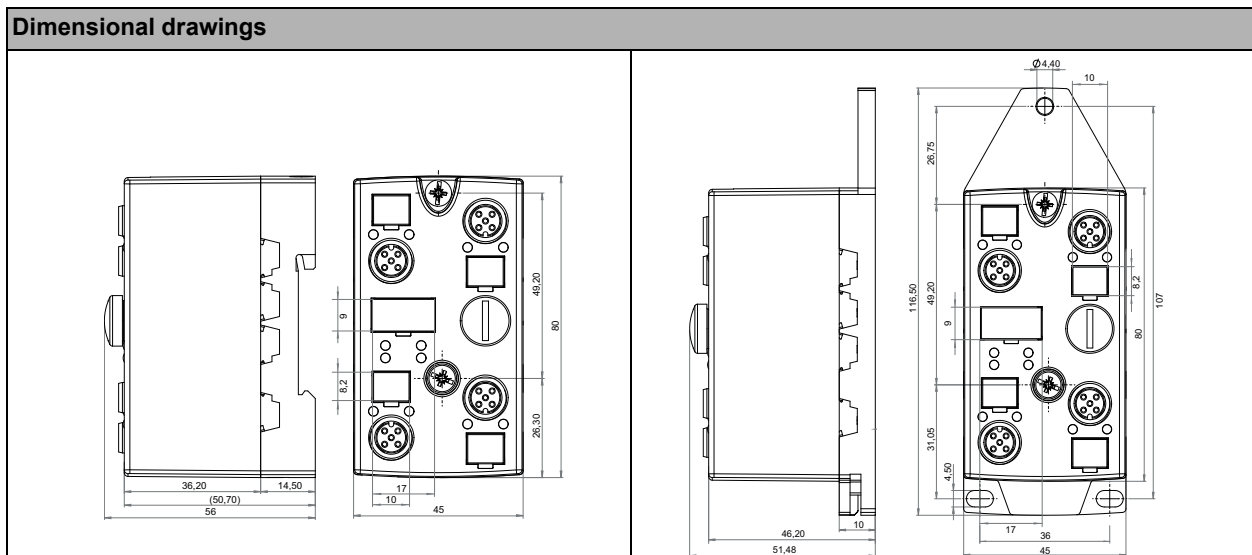
(2)



(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



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
BWU4042	•	•	•

UL-specifications (UL508) BWU4042	
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							
BWU4042	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							
BWU4042	0	reserved <sup>(1)</sup>	RO Ch1	USE Ch1	4TE Ch1	2C Ch1	CW Ch1	SV Ch1	RS Ch1
	1	Prescaler Index Ch1 (integer) <sup>(2)</sup>							
	2	reserved <sup>(1)</sup>	RO Ch2	USE Ch2	4TE Ch2	2C Ch2	CW Ch2	SV Ch2	RS Ch2
	3	Prescaler Index Ch2 (integer) <sup>(2)</sup>							
	4	reserved <sup>(1)</sup>	RO Ch3	USE Ch3	4TE Ch3	2C Ch3	CW Ch3	SV Ch3	RS Ch3
	5	Prescaler Index Ch3 (integer) <sup>(2)</sup>							
	6	reserved <sup>(1)</sup>	RO Ch4	USE Ch4	4TE Ch4	2C Ch4	CW Ch4	SV Ch4	RS Ch4
	7	Prescaler Index Ch4 (integer) <sup>(2)</sup>							

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

<sup>(2)</sup> see table "Prescaler Index"

Name	Explanation
RO Chx	<b>Rollover:</b> 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	<b>use Pin2 channel x</b> 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	<b>4-times evaluation:</b> 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	<b>counter mode channel x</b> 0 = 1-channel input counter (pulse counter) 1 = 2-channel input counter (encoder)
CW Chx	<b>direction of rotation channel x</b> 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	<b>start value channel x</b> 0 = start value 0 (default = 0) 1 = start value 1 (default = -32768)
RS Chx	<b>reset channel x</b> 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											
BWU4042	Index (dec)	255	...	8	7	6	5	4	3	2	1	0
	Prescale value	reserved			128	64	32	16	8	4	2	1

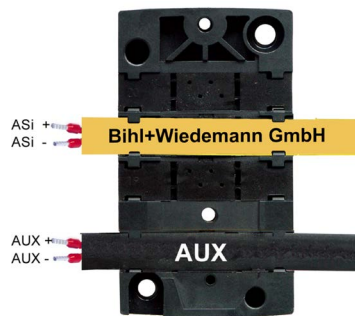
## Pin assignment

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 <sub>out of ASi</sub>	power supply, out of ASi, positive pole (sensor supply)
0V <sub>out of ASi</sub>	power supply, out of ASi, negative pole (sensor supply)
Shield	shield

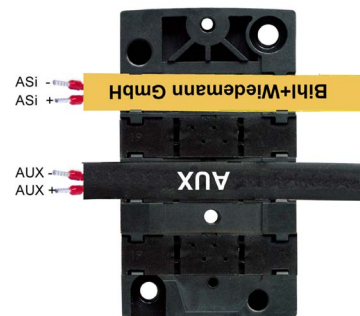
Connections							
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU4042	<b>Configuration as: 4 x 2-channel input</b>						
	X1	C1A/C1B	24 V <sub>out of ASi</sub>	C1 Channel B	0 V <sub>out of ASi</sub>	C1 Channel A	n.c.
	X2	C2A/C2B	24 V <sub>out of ASi</sub>	C2 Channel B	0 V <sub>out of ASi</sub>	C2 Channel A	n.c.
	X3	C3A/C3B	24 V <sub>out of ASi</sub>	C3 Channel B	0 V <sub>out of ASi</sub>	C3 Channel A	n.c.
	X4	C4A/C4B	24 V <sub>out of ASi</sub>	C4 Channel B	0 V <sub>out of ASi</sub>	C4 Channel A	n.c.
	ADDR (dummy plug)	connection for ASi-5 addressing device					
	<b>Configuration as: 4 x 1-channel input</b>						
	X1	C1A/C1B	24 V <sub>out of ASi</sub>	Status 1	0 V <sub>out of ASi</sub>	Pulse 1 +	n.c.
	X2	C2A/C2B	24 V <sub>out of ASi</sub>	Status 2	0 V <sub>out of ASi</sub>	Pulse 2 +	n.c.
	X3	C3A/C3B	24 V <sub>out of ASi</sub>	Status 3	0 V <sub>out of ASi</sub>	Pulse 3 +	n.c.
	X4	C4A/C4B	24 V <sub>out of ASi</sub>	Status 4	0 V <sub>out of ASi</sub>	Pulse 4 +	n.c.
	ADDR (dummy plug)	connection for ASi-5 addressing device					

### Mounting according to cable direction

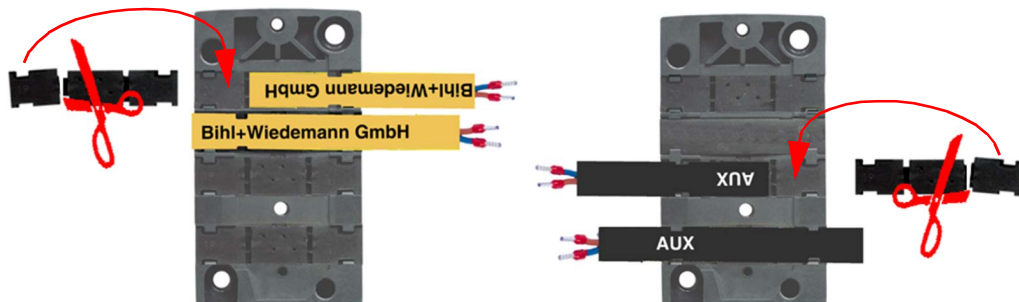


ordinary



turned

### Line termination with sealing profiles / as junction



### Accessories:

- ASi substructure module for 4 channel module in 45 mm housing (art. no. BWU2349)
- ASi substructure module (CNOMO) for 4 channel module in 45 mm housing (art. no. BWU2350)
- Protection caps for ASi-5 addressing socket, IP67, M12 (art. no. BW4056)
- Sealing profile IP67 (IDC plug), 45 mm (art. no. BW3283)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4708)