

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 AUX	ASi profile cable	1 ASi-5 address	BWU4414

(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 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".

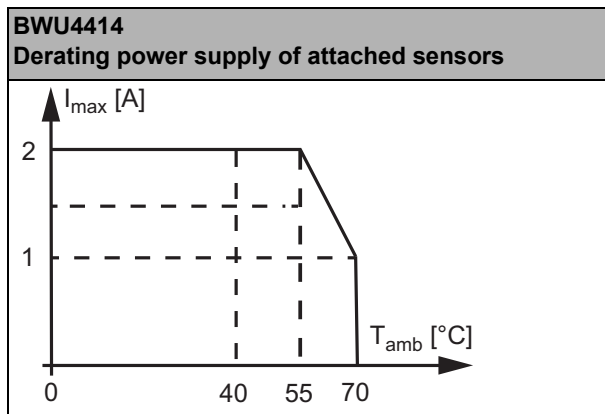
Article No.		BWU4414
General data		
Device type		counter input
Connection		
ASi connection		profile cable and piercing technology
Periphery connection		M12
Length of connector cable		I/O: 20 m ⁽¹⁾
ASi		
Address		1 ASi-5 address
Required master profile		M5
Since ASi specification		5
ASi process data width		8 byte ⁽²⁾
Operating voltage		30 V (18 ... 31.6 V)
Max. current consumption		45 mA
Max. current consumption without sensor/ actuator supply		45 mA
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)
Power supply		out of AUX
Sensor supply		short-circuit and overload protected according to EN 61131-2
Power supply of attached sensors	up to +40 °C	2 A ⁽³⁾
	at +55 °C	
	at +70 °C	1 A ⁽³⁾
Impulse 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 ⁽⁴⁾ or address 0 off: no ASi voltage
LED FAULT (red)		on: ASi address 0 or ASi node offline flashing: peripheral fault ⁽⁴⁾ off: ASi node online
LED AUX (green)		on: 24 V _{DC} AUX off: no 24 V _{DC} AUX
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

Article No.	BWU4414
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 ⁽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 module)

(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.

(3)

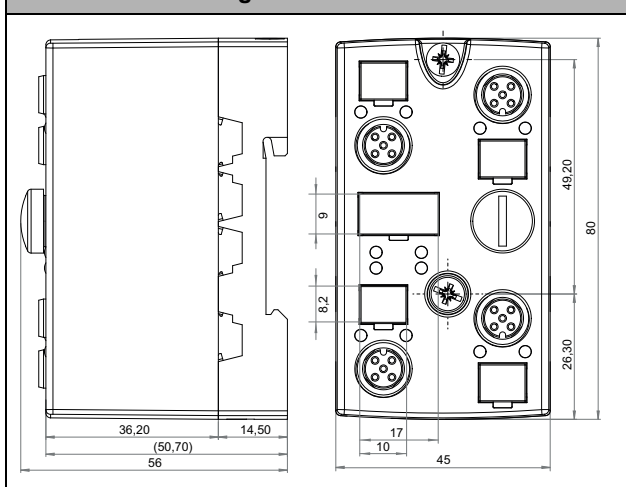


(4) See table "Peripheral fault indication"

(5) The module is suitable for use in passively safe paths as it has no connection to an AUX potential.

(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			
	input short circuited	counter overflow/underflow and RO Chx = 0	AUX voltage missing	status input (Pin2) in 1-channel mode is not active but bit USE CHx = 1
BWU4414	•	•	•	•

UL-specifications (UL508)

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) standard profile - factory default setting

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		Input							
BWU4414	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							
BWU4414	0	reserved ⁽¹⁾	RO Ch1	USE Ch1	4TE Ch1	2C Ch1	CW Ch1	SV Ch1	Start/stop Ch1
	1	Prescaler Index Ch1 (integer) ⁽²⁾							
	2	reserved ⁽¹⁾	RO Ch2	USE Ch2	4TE Ch2	2C Ch2	CW Ch2	SV Ch2	Start/stop Ch2
	3	Prescaler Index Ch2 (integer) ⁽²⁾							
	4	reserved ⁽¹⁾	RO Ch3	USE Ch3	4TE Ch3	2C Ch3	CW Ch3	SV Ch3	Start/stop Ch3
	5	Prescaler Index Ch3 (integer) ⁽²⁾							
	6	reserved ⁽¹⁾	RO Ch4	USE Ch4	4TE Ch4	2C Ch4	CW Ch4	SV Ch4	Start/stop 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: CxB before CxA = counting downwards
SV Chx	start value channel x 0 = start value 0 (default = 0) 1 = start value 1 (default = -2147483647) The stored start value for the SV Chx command can be adjusted via the prescaler index. ⁽¹⁾
Start/stop Chx	Start/stop channel x Start/stop changes from 0 to 1: counter starts with start value 0 resp. start value 1 Start/stop changes from 1 to 0: counter stops and keeps last value

⁽¹⁾

Article no.	Prescaler Index											
BWU4414	Index (dec)	255	...	8	7	6	5	4	3	2	1	0
	Prescaler value	reserved			128	64	32	16	8	4	2	1

Notice

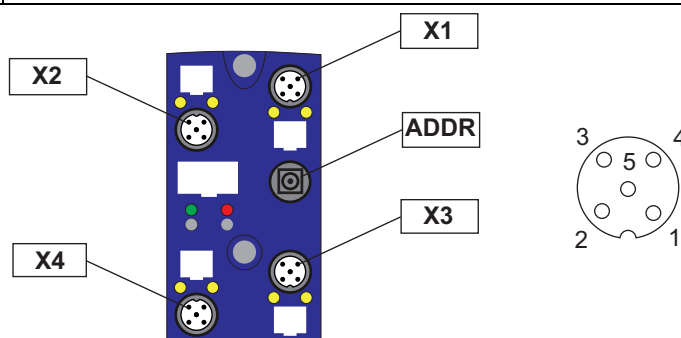
For information on the process and parameter data of the extended profile (available from Ident. No. =18955), please refer to the configuration manual of the counter modules.

Pin assignment

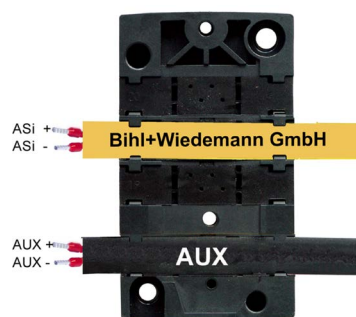
Signal name	Explanation
C x channel A, B	counter input x channel A, B (2-channel mode)
Status x	status input x (1-channel mode)
Pulse x+	pulse counter input x, high rise (1-channel mode)
24V _{ext out}	power supply, out of external voltage, positive pole (AUX)
0V _{ext out}	power supply, out of external voltage, negative pole (AUX)
Shield	shield

Connections

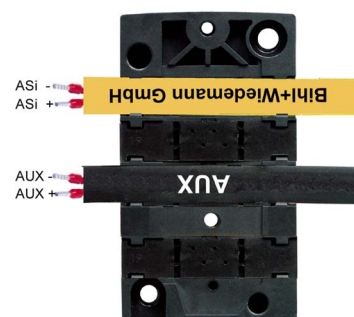
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU4414	Configuration as: 4 x 2-channel input						
	X1	C1A/C1B	24 V _{ext out}	C1 Channel B	0 V _{ext out}	C1 Channel A	n.c.
	X2	C2A/C2B	24 V _{ext out}	C2 Channel B	0 V _{ext out}	C2 Channel A	n.c.
	X3	C3A/C3B	24 V _{ext out}	C3 Channel B	0 V _{ext out}	C3 Channel A	n.c.
	X4	C4A/C4B	24 V _{ext out}	C4 Channel B	0 V _{ext out}	C4 Channel A	n.c.
	ADDR (protection cap)	connection for ASI-5 addressing plug					
	Configuration as: 4 x 1-channel input						
	X1	C1A/C1B	24 V _{ext out}	Status 1	0 V _{ext out}	Pulse 1 +	n.c.
	X2	C2A/C2B	24 V _{ext out}	Status 2	0 V _{ext out}	Pulse 2 +	n.c.
	X3	C3A/C3B	24 V _{ext out}	Status 3	0 V _{ext out}	Pulse 3 +	n.c.
	X4	C4A/C4B	24 V _{ext out}	Status 4	0 V _{ext out}	Pulse 4 +	n.c.
	ADDR (protection cap)	connection for ASI-5 addressing plug					



Mounting according to cable direction

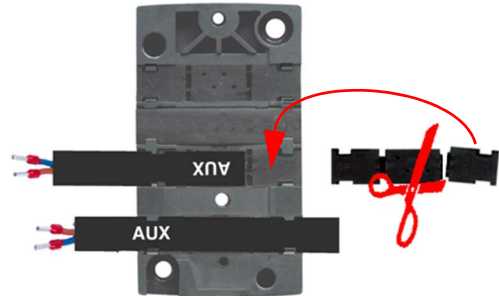
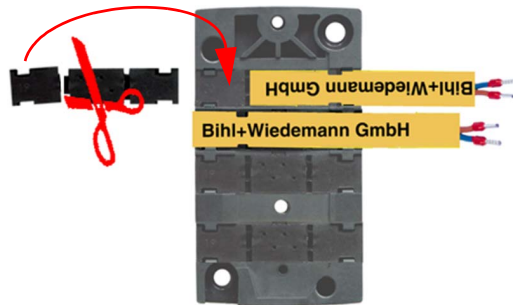


ordinary



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)
- Universal protection cap ASi-5/ASi-3 for M12 sockets, IP67 (art. no. BW4056)
- Sealing profile IP67 (IDC plug), 45 mm (art. no. BW3283)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)