

ASi-5 Safety Thermocouple Module, IP67, M12

4 x M12 connections for analog inputs for thermocouples type J, K, N, R, S

Use of different types of thermocouples per module possible

Protection category IP67

Only in combination with an ASi-5 safety monitor from Bihl+Wiedemann



(Figure similar)



Figure	Type	Inputs analog	Safety signal inputs	Input voltage (sensor supply) ⁽¹⁾	Output voltage (actuator supply) ⁽²⁾	ASi address ⁽³⁾	Art. no.
	IP67, 4x M12, ASi-5 Safety	4 x analog input	4 x thermocouple type J, K, N, R, S	out of ASi	–	1 ASi-5 address	BWU4424

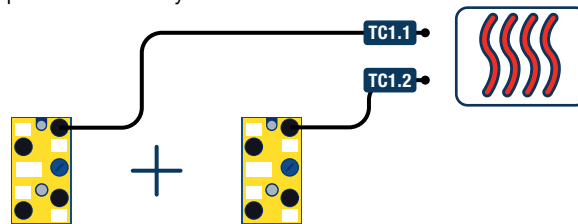
(1) **Input voltage (sensor supply):** inputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, inputs shall not be connected to earth or to external potential.

(2) **Output voltage (actuator supply):** outputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, outputs shall not be connected to earth or to external potential

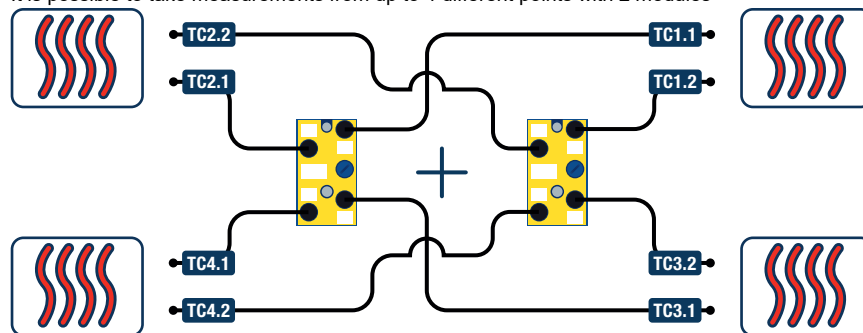
(3) **ASi address:** 1 AB address (max. 62 AB addresses/ASi network), 2 AB addresses (max. 31 modules with 2 AB addresses), Single addresses (max. 31 Single addresses/ASi network), ASi-5 address (max. 62 ASi-5 addresses/ASi network), mixed use allowed. Upon request, ASi nodes are available with specific ASi address profiles.

Article No.	BWU4424
General Data	
Device type	safe analog input
Connection	
ASi connection	profile cable and piercing technology
AUX connection	–
Periphery connection	M12
ASi	
Address	1 ASi-5 address
ASi process data length	8 byte
Operating voltage	30 V (18 ...31,6 V)
Max. current consumption	< 100 mA
Analog input	
Number	4 x safe analog inputs ⁽¹⁾
Safety input signal	thermocouple type J, K, N, R, S (type K = default)
Resolution	16 Bit (0,1 °C)
Range of value	depends on range of thermocouple (type K:-200 °C ... +1350 °C)
Measurement deviation	<0,2 % ⁽²⁾
Internal resistance	1 MΩ
Max. input voltage	–
Max. input current	–
Power supply	out of ASi
Display	
LED ASi (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽³⁾ or address 0 off: no ASi voltage
LED FLT/FAULT (red)	on: no data exchange, ASi address 0 or ASi node offline flashing: peripheral fault ⁽³⁾ off: no ASi voltage
LEDs TC1 ... TCn (yellow)	state of inputs TC1 ... TC4 flashing: PT1000/thermocouple not connected or out of the valid value range
Environment	
Applied standards	EN 61000-6-2 EN 61000-6-4 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
Operating temperature	-30 °C ... +55 (up to max. +70 °C) ⁽⁵⁾
Storage temperature	-25 °C ... +85 °C
Housing	plastic, for DIN rail mounting or for screw mounting
Pollution degree	2
Protection category	IP67
Maximum tolerable shock and vibration stress	≤15g, T≤11 ms 5 ... 500 Hz: 5 Hz, 50 mmpp; 7,6 Hz, 50 mmpp/6g; 500 Hz, 6g
Insulation voltage	≥500 V
Weight	100 g
Dimension (W / H / D in mm)	45 / 80 / 42

- (1) To achieve redundant temperature measurements, it is necessary to always use 2 x BWU4424 modules in parallel to obtain separate temperature values. It is possible to combine different types of thermocouples in both modules. The measurements of the same connection sockets in both modules will be paired automatically.

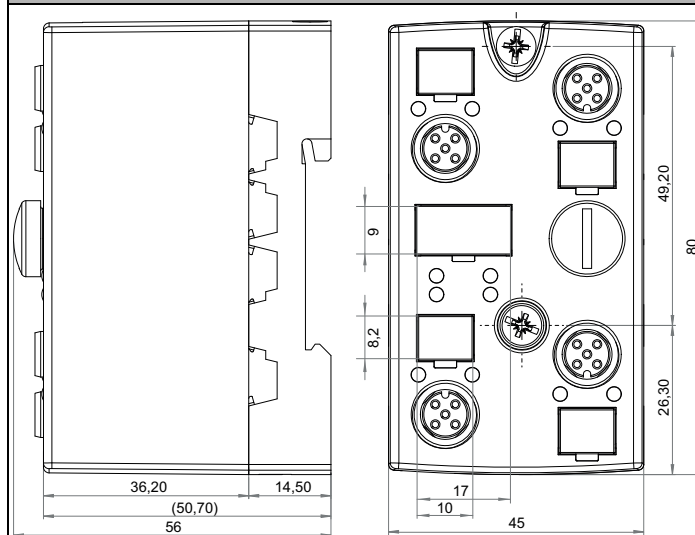


It is possible to take measurements from up to 4 different points with 2 modules



- (2) Related to the measuring range end value
(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

Dimensional drawings



UL-specifications (UL508)

BWU4424

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.

Article No.	Peripheral fault indication	
	analog signal outside range of values	at least 1 configured channel not connected
BWU4424	•	•

Programming: ASi bit assignment

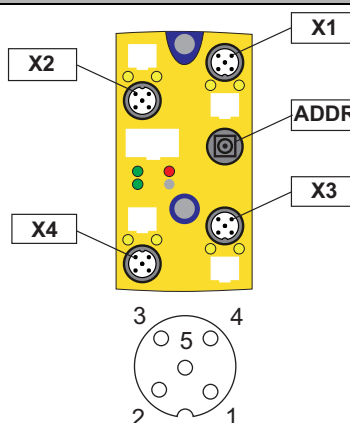
Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		analog input							
BWU4424	0	temperature TC1 (Resolution: 0,1 °C)							
	1								
	2	temperature TC2 (Resolution: 0,1 °C)							
	3								
	4	temperature TC3 (Resolution: 0,1 °C)							
	5								
	6	temperature TC4 (Resolution: 0,1 °C)							
	7								

Pin assignment

Signal name	Explanation
TCx +	Thermo element + for analog input x
TCx –	Thermo element – for analog input x
Rx +	Pt1000 + (External cold junction compensation) for analog input x
Rx –	Pt1000 – (External cold junction compensation) for analog input x

Connections							
Article No.	M12 conn.	Mark	Pin1	Pin2	Pin3	Pin4	Pin5
BWU4424	X1	TC1	R1 + ⁽¹⁾	TC1 +	R1 – ⁽¹⁾	TC1 –	n.c.
	X2	TC2	R2 + ⁽¹⁾	TC2 +	R2 – ⁽¹⁾	TC2 –	n.c.
	X3	TC3	R3 + ⁽¹⁾	TC3 +	R3 – ⁽¹⁾	TC3 –	n.c.
	X4	TC4	R4 + ⁽¹⁾	TC4 +	R4 – ⁽¹⁾	TC4 –	n.c.
	ADDR (protection cap)	connection for ASi-5 addressing plug					

The diagram shows a yellow terminal block with five rows of terminals. The first four rows are labeled X1, X2, X3, and X4. Each row has two circular terminals and two square terminals. The fifth row is labeled ADDR and has a single square terminal. Below the terminal block is a circular diagram with five pins labeled 1, 2, 3, 4, and 5. Pin 1 is at the bottom right, pin 2 at the bottom left, pin 3 at the top left, pin 4 at the top right, and pin 5 in the center.



⁽¹⁾ Pt1000 external cold junction compensation, e.g. BW5220.

Note	
	External cold junction compensation required, for example BW5220. Cold junction compensation via M12 connector with integrated Pt1000 resistance thermometer to compensate for the reference junction temperature for thermocouples.

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)
- M12 plug for cold junction compensation (art. no. BW5220)