ASi Safety Analog Input Module, IP20

2 safe inputs

in one module:
4 ... 20 mA or 0 ... 10 V or Pt100

or thermocouple (type J / K / N / R / S)

Applications up to category 4/PLe/SIL 3

(figure similar)

The ASi Safety Input Module for analog inputs is monitoring 2 analog signals with 4 ... 20 mA, 0 ... 10 V, Pt100 or thermocouples.

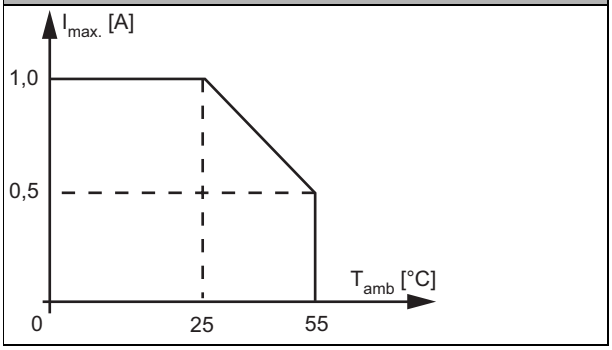
The module provides a safety SaW code sequence, if the input signal is located within the adjustable safety range.
The two inputs can be analyzed as one safe 2-channel input (up to SIL3).

Article no.	BWU2692	BWU3271
General Data		
Device type	input	
Connection		
ASi / AUX connection	Push-in terminals	Push-in terminals
Periphery connection	Push-in terminals	soldered screw terminals
ASi		
Profile	safe input slave: S-0.B.E, ID1=F configuration slave: S-7.A.5, ID1=7 (default)	
Address	depending on configuration	
Required Master profile	≥ M4	
Since ASi specification	3.0	
Operating voltage	30 V_{DC} (18 ... 31,6 V)	
Max. current consumption	≤ 110 mA	
AUX		
Operating voltage	24 V_{DC} (18 ...30 V)	–
Max. current consumption	1 A (0,5 A at 55 °C) (1)	–
Input		
Number	2 x analog standard inputs or 1 x 2 channel safe input, isolated	
Safety signal inputs	4 ... 20 mA / 0 ... 10 V / Pt100	thermocouple
Resolution	16 Bit (1 µA / 1 mV)	16 Bit (0,1 °C)
Range of value	4000 ... 20000 dec. (4 ... 20 mA) / 0 ... 10000 dec.(0 ... 0 V) / -2000 ... 8500 dec (-200 ... 850 °C)	-2700 ... 17500 dec (-270 ... 1750 °C)
Measurement deviation	< 1 % (2)	< 0,2 % (2) (5)
Internal resistance	50 Ω / 100 kΩ	>1 MΩ
Max. input voltage	25 V	–
Max. input current	40 mA	–
Power supply of attached sensors	out of AUX	–

Article no.	BWU2692	BWU3271
Display		
LEDs I1, I2 (yellow)	state of current inputs I1, I2	–
LEDs U1, U2 (yellow)	state of voltage inputs U1, U2	–
LEDs, R1, R2 (yellow)	state of Pt100 inputs R1, R2	–
LEDs TC1, TC2 (yellow)	–	state of thermocouple inputs TC1, TC2
LEDs F1, F2 (yellow)	on: safety range, SAW sequence is running off: no safety range, 0 sequence (shut off) is running	
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: no data exchange, slave address 0 or slave offline flashing: peripheral fault (3) off: slave online	
LED AUX (green)	on: 24 V_{DC} AUX	–
LED CONF (yellow)	off: normal operation mode	
Environment		
Applied standards	EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061 SIL3 (4) EN ISO 13849-1 PLe (4)	
Operating altitude	max. 2000	
Ambient operating temperature	0 °C … +55 °C	
Storage temperature	-25 °C … +85 °C	
Housing	plastic, for DIN-rail mounting	
Protection category	IP20	
Voltage of insulation	≥500 V	
Dimensions (W / H / D in mm)	22,5 / 99,6 / 114	

(1)

Derating max. current out of AUX



(2) Related to the measuring range end value

(3) **See table "Peripheral fault indication"**

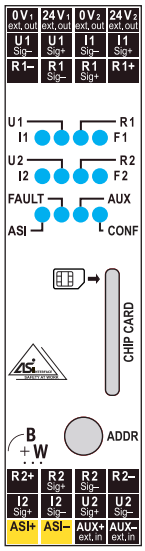
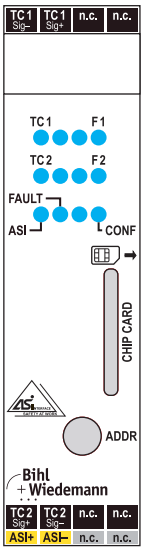
(4) In accordance with EN 746-2, Par. 5.7.2.b, components which meet a defined SIL / PL Level according to EN 62061 and EN ISO 13849-1 are approved for use in thermoprocessing equipment.

(5) In order to achieve the best possible measuring accuracy, we recommend performing the installation with a distance equivalent to the width of one module on both sides of adjacent modules (see installation instructions).

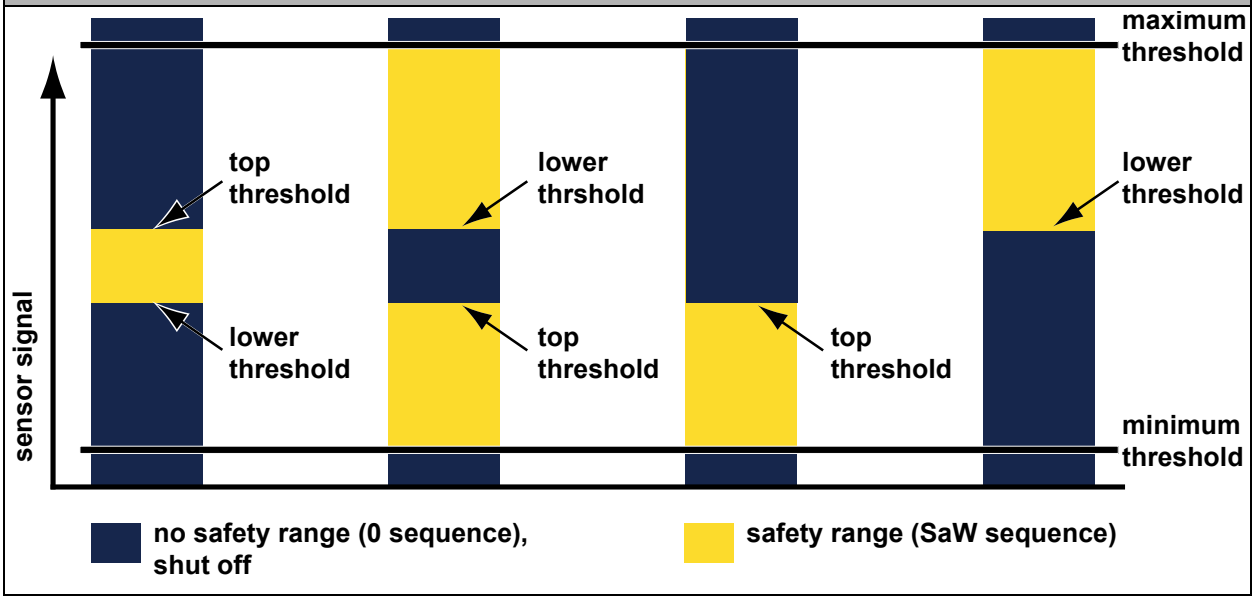
	Push-in terminals
General	
Nominal cross section	2,5 mm^2
Conductor cross section	
Conductor cross section solid	0,2 ... 2,5 mm^2
Conductor cross section flexible	0,2 ... 2,5 mm^2
Conductor cross section flexible, with ferrule	without plastic sleeve: 0,2 ... 2,5 mm^2
	with plastic sleeve: 0,25 ... 2,5 mm^2
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0,5 ... 1,5 mm^2
AWG	24 ... 14
Stripped insulation length	10 mm

UL-specifications (UL508) BWU2692, BWU3271	
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.

Article No.	Peripheral fault indication		
	analog signal outside range of values	difference between channels is outside of preset margin	AUX voltage missing
BWU2692	•	•	•
BWU3271	•	•	–

BWU2692	BWU3271	Clamps	Description
		0 $V_{1\ ext.out}$, 24 $V_{1\ ext.out}$, 0 $V_{2\ ext.out}$, 24 $V_{2\ ext.out}$	connection for power supply of sensors
		U1 Sig-, U1 Sig+	connection 0...10 V safety input 1
		I1 Sig-, I1 Sig+	connection 4...20 mA safety input 1
		R1-, R1 Sig-, R1 Sig+, R1+	connection PT100 safety temperature 1
		R2+, R2 Sig+, R2 Sig-, R2-	connection PT100 safety temperature 2
		TC1 Sig-, TC1 Sig+	connection thermocouple safe temperature 1
		TC2 Sig+, TC2 Sig-	connection thermocouple safe temperature 2
		I2 Sig+, I2 Sig-	connection 4...20 mA safety input 2
		U2 Sig+, U2 Sig-	connection 0...10 V safety input 2
		ASI+, ASI-	connection to ASi bus
		AUX+ $_{ext.\ in}$, AUX- $_{ext.\ in}$	connection for external 24 V_{DC} (AUX)
		n.c.	not connected

Setting the threshold values



Programming

Configuration Slave			
analog inputs			
AI1: analog value sensor 1	AI2: analog value sensor 2	–	–
digital input			
DI0: input 1: safety range, SaW sequence is running	DI1: input 2: safety range, SaW sequence is running	DI2: S-7.5 data	DI3: S-7.5 data
digital output			
DO0: S-7.5 data	DO0: S.7.5 data	DO2: 0 sequence is running (shut off)	DO3: –

Safe Input Slave				
Article no.	**digital input**			
BWU2692 / BWU3271	Saw sequence			
Article no.	**digital output**			
BWU2692	DO0: –	DO1: –	DO2: –	D3: –
BWU3271	DO0: acknowledgment short circuit detection			

LED status display

LED	State	Signal / Description
ASI (green)	○	no ASi voltage
	◐ 1 Hz	ASi voltage present, but at least one ASi slave is addressed „0“ or peripheral fault
	●	ASi voltage present
AUX (green)	○	no 24 V_{DC} AUX
	●	24 V_{DC} AUX present

LED	State	Signal / Description
FLT (red)		ASi communication OK (at least one ASi slave on line)
	 1 Hz	at least one ASi slave with peripheral fault
		no data exchange (with at least one correctly addressed ASi slave)
CONF (yellow)		normal operation mode
	 2 x 1 Hz	chip card is written
U1, U2 (yellow)		no voltage input
		voltage input selected
	 1 Hz	error message
I1, I2 (yellow)		no current input
		current input selected
	 1 Hz	error message
R1, R2 (yellow)		no Pt100 input
		Pt100 input selected
	 1 Hz	error message
TC1, TC2 (yellow)		no thermocouple input
		thermocouple input selected
	 1 Hz	error message
F1, F2 (yellow)		no safety range (0 sequence), shut off is running
		safety range (SaW sequence), at least one code sequence is running
	 1 Hz	error message
 LED on  LED flashing  LED off		

	In case all LEDs are blinking simultaneously in fast rhythm a fatal error has been detected. This message is reset by a short disconnection of the power supply (Power ON Reset).