

ASi-5 Safety Input Module

2 x 2 channel safe inputs for

- 2 x floating contacts or
- 2 x OSSDs or
- 1 x floating contacts and 1 x OSSD

up to 8 standard inputs, depending on configuration

up to 8 standard outputs, depending on configuration

Module width of 22.5 mm,
for optimum use of control cabinet space

protection category IP20



(Figure similar)



Figure	Type	Inputs Safety, SIL 3, cat. 4	Safety signal inputs	Inputs digital	Outputs digital	Input voltage (sensor supply) (1)	Output voltage (actuator supply) (2)	ASi connection (3)	ASi address (4)	Article no.
	IP20, 22.5 mm x 114 mm, 6 x COMBICON, ASi-5 Safety	2 x 2 channels	floating contacts	up to 8, depending on configuration	up to 8 x electronic, depending on configuration	out of AUX	out of AUX	ASi via profile cable	1 ASi-5 address	BWU4186
	IP20, 22.5 mm x 114 mm, 6 x COMBICON, ASi-5 Safety	2 x 2 channels	OSSDs	up to 8, depending on configuration	up to 8 x electronic, depending on configuration	out of AUX	out of AUX	ASi via profile cable	1 ASi-5 address	BWU4187
	IP20, 22.5 mm x 114 mm, 6 x COMBICON, ASi-5 Safety	2 x 2 channels	floating contacts + OSSDs	up to 8, depending on configuration	up to 8 x electronic, depending on configuration	out of AUX	out of AUX	ASi via profile cable	1 ASi-5 address	BWU4188

(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 connection:** the connection to ASi as well to AUX (auxiliary 24V power) is either made via yellow resp. black ASi profile cable with piercing technology or via M12 socket (in IP20 via clamps).

(4) **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), mixed use allowed.
For modules with two ASi nodes the second ASi node is turned off as long as the first ASi node is addressed to address "0".
Upon request, ASi nodes are available with specific ASi address profiles.

ASi-5 Safety Input Module, IP20, 22.5 mm

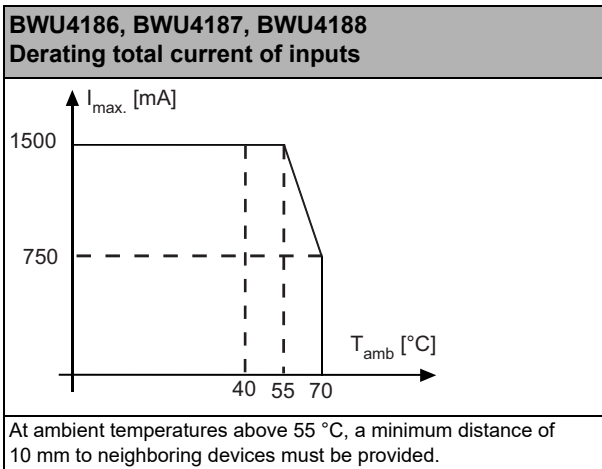
Article no.	BWU4186		BWU4188		BWU4187	
Connection						
ASi/AUX connection			Push-in terminals			
Periphery connection			Push-in terminals			
Length of connector cable			I/O: max. 15 m ⁽¹⁾			
ASi						
Adresse			1 ASi-5 address			
Required ASi specification of the Master			ASi-5			
Operating voltage			30 V _{DC} (18 ... 31,6 V)			
Max. current consumption			100 mA			
Max. current consumption without sensor/actuator supply			100 mA			
AUX						
Voltage			24 V _{DC} (20 ... 30 V) (PELV) ⁽²⁾			
Max. current consumption			3 A max.			
Input						
Number			up to 8, depending on configuration			
Power supply			out of AUX			
Sensor supply			short-circuit and overload protected, acc. to EN 61131-2			
Supply of attached sensors	up to +40 °C			200 mA per input, Σ (In) 1500 mA ⁽³⁾		
	at +55 °C					
	at +70 °C			200 mA per input, Σ (In) 750 mA ⁽³⁾		
Switching threshold			U < 5 V (low) U > 15 V (high)			
Output						
Number			up to 8 x electronic, depending on configuration			
Power supply			out of AUX			
Output			short-circuit and overload protected, acc. to EN 61131-2			
Max. output current	up to +40 °C			350 mA per output, Σ (Out) 1500 mA ⁽⁴⁾		
	at +55 °C					
	at +70 °C			350 mA per output, Σ (Out) 750 mA ⁽⁴⁾		
Safety input, SIL 3, Kat. 4						
Number			2 x 2 channel safe inputs			
Safety signal	floating contacts		1 x floating contacts + 1 x OSSDs		OSSDs	
Power supply			out of AUX			
Switching current			15 mA (T = 100µs), continuously 4 mA at 24 V		-	
Max. output current for OSSD supply	-		Σ (In/Out) < 320 mA			
OSSD test pulses	-		0 ... 50 Hz			
OSSD test pulse width	-		U _{aux} ≥ 21,5 V = 0 ... 1 ms test pulses possible U _{aux} ≥ 17 V = 0 ... 0,8 ms test pulses possible U _{aux} < 17 V = 0 ... 0,6 ms			
Input level	10 mA, R < 150 Ω		for floating contacts: 10 mA, R < 150 Ω for OSSDs: V _{in} > 11 V for High-Level, input current > 2 mA at 15 V		V _{in} > 11 V for High-Level, input current > 2 mA at 15 V	

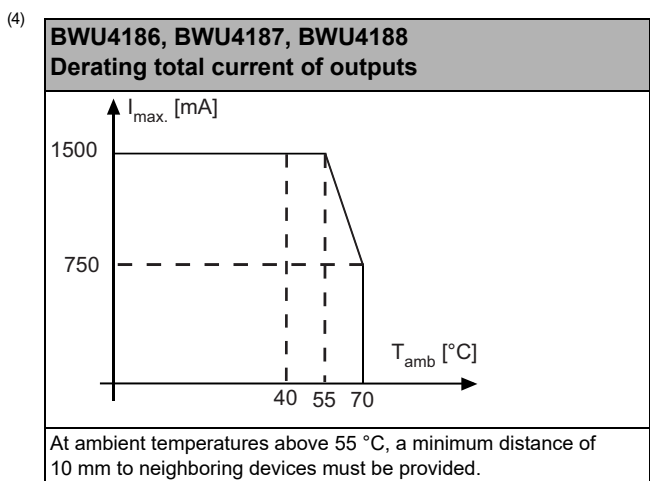
Article no.	BWU4186	BWU4188	BWU4187
Display			
LED ASi (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽⁵⁾ or address 0 off: no ASi voltage		
LED FLT/FAULT (red)	on: ASi address 0 or ASi node offline flashing: peripheral fault ⁽⁵⁾ off: ASi node online		
LED AUX (green)	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX		
LEDs I/O1 ... I/On (green/red)	state of inputs I1 ... I8 or outputs O1 ... O8, depending on configuration off: corresponding input or output is turned off yellow: the corresponding input or output is turned on red flashing: output short circuit ⁽⁵⁾ at the corresponding output red: overload sensor supply ⁽⁵⁾ at the corresponding input		
LEDs S11, S12, S21, S22 (yellow)	state of safe 2-channel inputs S11/S12 (SI1), S21/S22 (SI2)		
Environment			
Applied standards	EN 61000-2 EN 61000-3 EN 61131-2 EN 62061 EN ISO 13849-1 EN 60529		
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽⁶⁾		
Operating altitude	max. 2000 m		
Ambient operating temperature	-30 °C ... +55 °C (up to max. +70 °C) ⁽⁷⁾		
Storage temperature	-25 °C ... +85 °C		
Housing	plastic, for screw mounting		
Pollution Degree	2		
Protection category	IP20		
Tolerable loading referring to humidity	according to EN 61131-2		
Voltage of insulation	≥500 V		
Weight	125 g		
Dimension (W / H / D in mm)	22.5 / 99 / 114		

(1) loop resistance ≤150 Ω

(2) The ground connection of the 24 V power supply, which supplies auxiliary power (AUX), must be grounded!

(3)





- (5) See table "Peripheral fault indication"
- (6) The module is not suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors cannot be assumed for the connection of the two ASi and AUX potentials.
If the module is supplied from an unswitched AUX cable, this has no influence on the safety consideration for the paths with passively safe-switched AUX cable. In an ASi circuit, paths supplied from a passively safe-switched AUX cable and paths supplied from unswitched AUX potential can be used together.
- (7) Maximum ambient operating temperature +55 °C according UL certificate for the use in the USA and Canada.

Wiring rules

Push-in terminals, 2 /3 /4 poles (pitch 5 mm)	
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: 0.25 ... 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) BWU4186, BWU4187, BWU4188	
External protection	An isolated source with a secondary open circuit voltage of .30 VDC 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				
	Overload sensor supply	Output short circuited	Cross connection	Output overload	AUX voltage missing
BWU4186	•	•	•	•	•
BWU4187	•	•	–	•	•
BWU4188	•	•	•	•	•

Programming: ASi bit assingment

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		Input							
BWU4186	0	reserved				S22	S21	S12	S11
	1	I8	I7	I6	I5	I4	I3	I2	I1
BWU4187	0	reserved				OSSD4 (S22)	OSSD3 (S21)	OSSD2 (S12)	OSSD1 (S11)
	1	I8	I7	I6	I5	I4	I3	I2	I1
BWU4188	0	reserved				OSSD2 (S22)	OSSD1 (S21)	S12	S11
	1	I8	I7	I6	I5	I4	I3	I2	I1

Article no.	Byte	Bit							
		D7	D6	D5	D4	D3	D2	D1	D0
		Output							
BWU4186	0	reserved							
	1	O8	O7	O6	O5	O4	O3	O2	O1
BWU4187	0	reserved				Reset 2	reserved	Reset 1	
	1	O8	O7	O6	O5	O4	O3	O2	O1
BWU4188	0	reserved				Reset 2	reserved		
	1	O8	O7	O6	O5	O4	O3	O2	O1

Pin assignment

BWU4186	Terminals	Description	
	Sx1+/Sx1-, Sx2+/Sx2-	safe 2-channel input x for floating contacts	
	I/Ox	either digital input x or digital output x, freely configurable	
	I+	sensor supply	
	O-	reference potential for outputs	
	ASi+, ASi	connection to ASi bus	
	AUX+ _{ext.in} , AUX- _{ext.in}	power supply, out of external voltage (AUX)	
	n.c. (not connected)	not connected	
	ADDR	connection for ASi-5 addressing device	

BWU4187	Terminals	Description	
	Sx1/Sx2	safe 2-channel input x for OSSDs	
	0 V _{ext out} , 24 V _{ext out}	power supply for OSSDs x	
	RST x (reset)	reset signal for safe input x	
	I/Ox	either digital input x or digital output x, freely configurable	
	I+	sensor supply	
	O-	reference potential for outputs	
	ASi+, ASi	connection to ASi bus	
	AUX+ _{ext.in} , AUX- _{ext.in}	power supply, out of external voltage (AUX)	
	n.c. (not connected)	not connected	
	ADDR	connection for ASi-5 addressing device	

BWU4188	Terminals	Description	
	S11+/S11-, S12+/S12-	safe 2-channel input 1 for floating contacts	
	S21, S22	safe 2-channel input 2 for OSSDs	
	0 V _{ext out} , 24 V _{ext out}	power supply for OSSDs on safe input 2	
	RST x (reset)	reset signal for safe input 2	
	I/Ox	either digital input x or digital output x, freely configurable	
	I+	sensor supply	
	O-	reference potential for outputs	
	ASi+, ASi	connection to ASi bus	
	AUX+ _{ext.in} , AUX- _{ext.in}	power supply, out of external voltage (AUX)	
	n.c. (not connected)	not connected	
	ADDR	connection for ASi-5 addressing device	

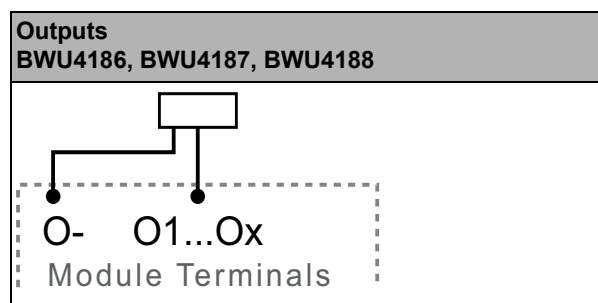
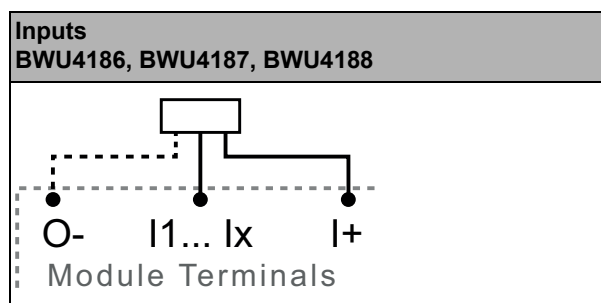
LED status display

LED	State	Signal / Description
AUX (green)		no 24 V _{DC} AUX
		24 V _{DC} AUX present
ASi (green)		no ASi voltage
		ASi voltage present, but at least one ASi node is addressed „0“ or peripheral fault
		ASi voltage present
FLT (red)		ASi communication OK (at least one ASi node online)
		at least one ASi node with peripheral fault
		no data exchange (with at least one correctly addressed ASi node)
S11/S12 ... S21/S22 (yellow)		safety input channel is switched off
		cross-connection
		internal error or double address
		safety input channel is switched on

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).

Power supply (PNP) via the Module



Note
The inputs need to be supplied out of AUX+!

Accessories:

- Bihl-Wiedemann Suite - Safety Software for Configuration, Diagnostics and Programming (art. no. BW2916)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)