

ASi Safety Input Modules (M12), IP67

for OSSDs, floating contacts or complementary switch

Applications up to category 4/PLe/SIL 3



(Figure similar)



Figure	Inputs Safety, SIL 3, cat. 4	Safety signal inputs	Outputs digital	Input voltage (sensor supply.) (1)	Output voltage (actuator supply.) (2)	ASi connection (3)	ASi address (4)	Special function	Article no.
	2 x 2 channels	floating contacts	-	out of ASi	-	ASi profile cable	2 single addresses	-	BWU2631
	1 x 2 channels	floating contacts	2 x electronic	out of ASi	out of AUX	ASi profile cable	1 single address	-	BWU2284
	1 x 2 channels	floating contacts	2 x electronic	out of ASi	out of AUX	ASi using M12	1 single address	-	BWU2369
	1 x 2 channels	OSSDs	2 x electronic	out of AUX	out of AUX	ASi profile cable	1 single address	-	BWU2270
	1 x 2 channels	OSSDs	2 x electronic	out of AUX	out of AUX	ASi profile cable	1 single address	reset output for opto-electronic protective devices	BWU2689
	1 x 2 channels	OSSDs	2 x electronic	out of AUX	out of AUX	ASi via M12	1 single address	-	BWU2370
	1 x 2 channels	OSSDs	2 x electronic	out of ASi	out of ASi	ASi via M12	1 single address	-	BWU2960
	1 x 2 channels	complementary switch	2 x electronic	out of ASi	out of AUX	ASi profile cable	1 single address	-	BWU2814

- (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.

Article no.	BWU2270	BWU2370	BWU2689	BWU2960
Connection				
ASi/AUX connection	profile cable and piercing technology	M12 ⁽⁵⁾	profile cable and piercing technology	M12 ⁽⁵⁾
Periphery connection	M12			
Length of connector cable	unlimited ⁽¹⁾			
ASi				
Profile	S-7.B.1, ID1=F			
Voltage	22 ... 31,6 V			
Required master profile	≥M0			
Max. current consumption	60 mA			
AUX				
Voltage	24 V (20 ... 30 V _{DC}) (PELV)			–
Max. current consumption	4 A max.			–
Input				
Number	1 x 2 channel safe input for OSSDs			
Safe input	OSSD			
Power supply	out of AUX			out of ASi
Sensor supply	short-circuit and overload protected according to EN 61131			
Input level	V _{in} > 11 V for High-Level, Input current > 2,5 mA at 15 V			
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			
Start delay	<22 ms			
Output				
Number	2, electronic			
Power supply	out of AUX			out of ASi
Output	short-circuit and overload protected according to EN 61131			
Max. output current	1 A per output			Σ = 50mA ⁽⁵⁾
Display				
LEDs S1, S2 (yellow)	state of inputs OSSD1, OSSD2			
LEDs O1, O2 (O3) (yellow)	state of outputs O1, O2	state of outputs O2, O3		state of outputs O1, O2
LED AUX (green)	24 V _{DC} AUX on			–
LED ASI (green)	ASi voltage on			
LED FLT/FAULT (red)	LED on: ASi communication error, ASi node does not participate in the normal exchange of data, e.g. ASi address 0 LED flashing: peripheral fault ⁽²⁾			

Article no.	BWU2270	BWU2370	BWU2689	BWU2960
Environment				
Applied standards	EN ISO 13849-1 PLe Kat4 EN ISO 13849-2 EN 62061 SIL 3 EN 62026-2 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 60529			
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽³⁾			yes ⁽⁶⁾
Operating altitude	max. 2000 m			
Ambient temperature	-30 °C ... +70 °C ⁽⁴⁾ , no condensation permitted			
Storage temperature	-25 °C ... +85 °C			
Housing	plastic, for DIN rail mounting	plastic, for screw mounting	plastic, for DIN rail mounting	plastic, for screw mounting
Pollution degree	2			
Protection category	IP67			
Tolerable loading referring to humidity	according to 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			
Weight	100 g			
Dimensions (W / H / D in mm)	45 / 80 / 42	45 / 116,5 / 47,5	45 / 80 / 42	45 / 116,5 / 47,5

(1) loop resistance ≤150 Ω

(2) See table „Peripheral fault indication“

(3) 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.

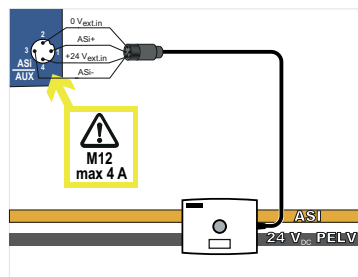
If the module is supplied from an unswitched AUX cable, this has no influence on the safety consideration for the paths with passively safe-switched AUX cable. In an ASi circuit, paths supplied from a passively safe-switched AUX cable and paths supplied from unswitched AUX potential can be used together.

(4) Temperature range up to -30°C from Ident.No. ≥16292 (BWU2270); Ident.No. ≥16294 (BWU2370); Ident.No. ≥16293 (BWU2689); Ident.No. ≥16369 (BWU2960)

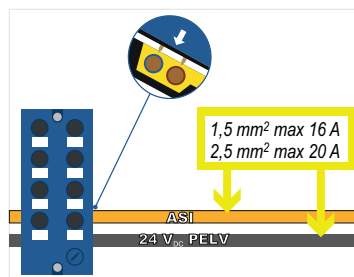
(5) **Line protection:**

If the module is supplied via a M12 connection with A or B coding, it may only be used with a current load of max. 4 A per pin in acc. with IEC 61076-2-101 and IEC 61076-2-109. A fused tap is recommended. There is no such limitation for modules supplied via piercing contacts.

Connection to ASi and AUX via M12



via piercing contacts



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

Article no.	BWU2814	BWU2284	BWU2369	BWU2631
Connection				
ASi/AUX connection	profile cable and piercing technology		M12 ⁽⁴⁾	profile cable and piercing technology
Periphery connection	M12			
Length of connector cable	I/O: max. 15 m ⁽¹⁾			
ASi				
Profile	S-7.B.0, ID1=F			S1: S-7.B.0, ID1=F S2: S-7.B.0, ID1=E
Required master profile	≥M0			
Voltage	22 ... 31,6 V			
Max. current consumption	80 mA			
AUX				
Voltage	24 V (20 ... 30 V _{DC}) (PELV)			–
Max. current consumption	3 A max.			–
Input				
Number	1 x 2 channel safe input for floating contacts			2 x 2 channel safe inputs for floating contacts
Safe input	non-equivalent switch	floating contacts		
Switching current	–	15 mA (T = 100 µs), continuously 4 mA at 24 V		
Power supply	out of ASi			
Sensor supply	short-circuit and overload protected according to EN 61131			
Input level	10 mA, R≤150 Ω			
Output				
Number	2, electronic			–
Power supply	out of AUX			–
Output	short-circuit and overload protected according to EN 61131			–
Max. output current	1 A per output			–
Display				
LEDs S1, S2 (S3, S4) (yellow)	state of inputs S1, S2			state of inputs S1.1,S1.2; S2.1, S2.2
LEDs O1, O2 (yellow)	state of outputs O1, O2			–
LED AUX (green)	24 V _{DC} AUX on			–
LED ASI (green)	ASi voltage on			
LED FLT/FAULT (red)	LED on: ASi communication error, ASi node does not participate in the normal exchange of data, e.g. ASi address 0 LED flashing: peripheral fault ⁽²⁾			

Article no.	BWU2814	BWU2284	BWU2369	BWU2631
Environment				
Applied standards	EN ISO 13849-1 PLe Kat4 EN ISO 13849-2 EN 62061 SIL 3 EN 62026-2 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 60529			
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽³⁾		yes ⁽⁶⁾	
Operating altitude	max. 2000 m			
Ambient temperature	0 °C ... +70 °C, no condensation permitted		-30 °C ... +70 °C ⁽⁵⁾ , no condensation permitted	
Storage temperature	-25 °C ... +85 °C			
Housing	plastic, for DIN rail mounting	plastic, for screw mounting	plastic, for DIN rail mounting	plastic, for DIN rail mounting
Pollution degree	2			
Protection category	IP67			
Tolerable loading referring to humidity	according to 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			
Weight	100 g			
Dimensions (W / H / D in mm)	45 / 80 / 42		45 / 116,5 / 47,5	45 / 80 / 42

(1) loop resistance ≤150 Ω

(2) See table „Peripheral fault indication“

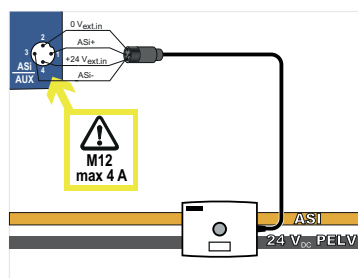
(3) The module is not suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors cannot be assumed for the connection of the two ASi and AUX potentials.

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.

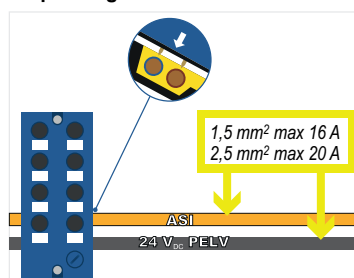
(4) **Line protection:**

If the module is supplied via a M12 connection with A or B coding, it may only be used with a current load of max. 4 A per pin in acc. with IEC 61076-2-101 and IEC 61076-2-109. A fused tap is recommended. There is no such limitation for modules supplied via piercing contacts.

Connection to ASi and AUX via M12



via piercing contacts



(5) Temperature range up to -30°C from Ident.No. ≥16286 (BWU2369); Ident.No. ≥16295 (BWU2631)

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

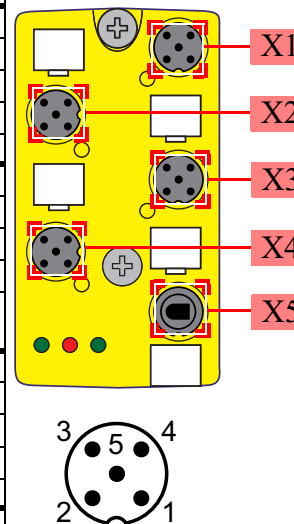
Article no.	Peripheral fault indication		
	cross connection S1 to S2	output overload	AUX voltage missing
BWU2270	—	•	•
BWU2689	—	•	•
BWU2284	•	•	—
BWU2814	•	•	—
BWU2369	•	•	—
BWU2370	—	•	•
BWU2631	•	—	—
BWU2960	—	•	—

UL-specifications (UL508)	
BWU2270, BWU2689, BWU2284, BWU2814, BWU2369, BWU2370, BWU2631, BWU2960	
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.

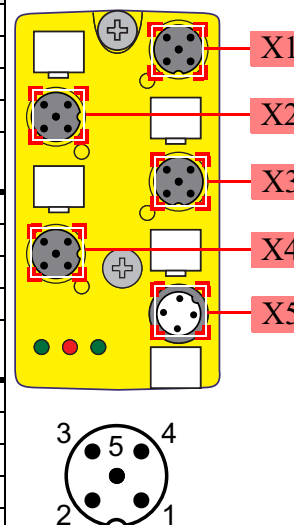
Programming	ASi bit assignment			
	D3	D2	D1	D0
	Safe input (ASi node 1)			
BWU2284 / BWU2369 / BWU2631	S2	S2	S1	S1
BWU2814	S2 denied	S2 denied	S1	S1
BWU2270 / BWU2370 / BWU2689 / BWU2960	OSSD2	OSSD2	OSSD1	OSSD1
	Safe input (ASi node 2)			
BWU2631	S4	S4	S3	S3
	Output			
BWU2270 / BWU2284 / BWU2369 / BWU2370 / BWU2814 / BWU2960	not used		O2	O1
BWU2689	not used	O3	O2	not used
	Parameter bit			
	P3	P2	P1	P0
BWU2270 / BWU2370 / BWU2689 / BWU2960	not used			Watchdog (0 = off / 1 = on)
BWU2284 / BWU2631 / BWU2369 / BWU2814	not used			

Pin assignment

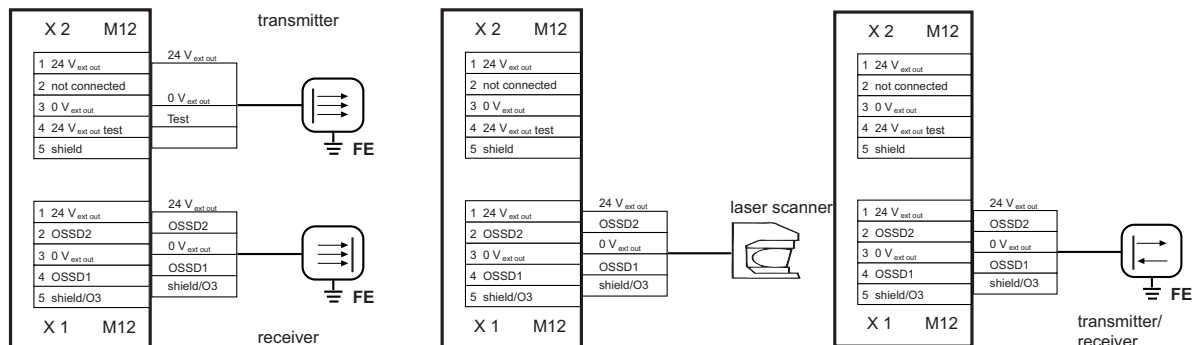
Connections							
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU2270	X1	S1	24V _{ext out}	OSSD2	0V _{ext out}	OSSD1	shield
	X2	S2	24V _{ext out}	n.c.	0V _{ext out}	24V _{ext out}	shield
	X3	O1	n.c.	O2	0V _{ext out}	O1	n.c.
	X4	O2	n.c.	n.c.	0V _{ext out}	O2	n.c.
	X5	ADDR	connection for ASi-3 addressing plug				
BWU2284	X1	S1	S1+	S1-	S2+	S2-	n.c.
	X2	S2	S2+	S2-	n.c.	n.c.	n.c.
	X3	O1	n.c.	O2	0V _{ext out}	O1	n.c.
	X4	O2	n.c.	n.c.	0V _{ext out}	O2	n.c.
	X5	ADDR	connection for ASi-3 addressing plug				
BWU2631	X1	S1	S1.1+	S1.1-	S1.2+	S1.2-	n.c.
	X2	S2	S1.2+	S1.2-	–	–	n.c.
	X3	S3	S2.1+	S2.1-	S2.2+	S2.2-	n.c.
	X4	S4	S2.2+	S2.2-	–	–	n.c.
	X5	F1/F2 ADDR	connection for ASi-3 addressing plug (ASi node 1: above, ASi node 2: below)				
BWU2689	X1	S1	24V _{ext out}	OSSD2	0V _{ext out}	OSSD1	O3
	X2	S2	24V _{ext out}	n.c.	0V _{ext out}	24V _{ext out}	shield
	X3	O3	n.c.	O2	0V _{ext out}	n.c.	n.c.
	X4	O2	n.c.	O3	0V _{ext out}	O2	n.c.
	X5	ADDR	connection for ASi-3 addressing plug				
BWU2814	X1	S1	NC contact		NO contact		n.c.
			S1+	S1-	S2+	S2-	
	X2	S2	NO contact		NC contact		n.c.
			S2+	S2-	S1+	S1-	
	X3	O1	n.c.	O2	0V _{ext out}	O1	n.c.
X4	O2	n.c.	n.c.	0V _{ext out}	O2	n.c.	
X5	ADDR	connection for ASi-3 addressing plug					



Connections							
Article no.	M12 connection	Marking	Pin1	Pin2	Pin3	Pin4	Pin5
BWU2369	X1	S1	S1+	S1-	S2+	S2-	n.c.
	X2	S2	S2+	S2-	n.c.	n.c.	n.c.
	X3	O1	n.c.	O2	0V _{ext out}	O1	n.c.
	X4	O2	n.c.	n.c.	0V _{ext out}	O2	n.c.
	X5	ASI/ AUX _{ext.in}	ASi+	0V _{ext in}	ASi-	+24V _{ext in}	n.c.
BWU2370	X1	S1	24V _{ext out}	OSSD2	0V _{ext out}	OSSD1	shield
	X2	S2	24V _{ext out}	n.c.	0V _{ext out}	24V _{ext out}	shield
	X3	O1	n.c.	O2	0V _{ext out}	O1	n.c.
	X4	O2	n.c.	n.c.	0V _{ext out}	O2	n.c.
	X5	ASI/ AUX _{ext.in}	ASi+	0V _{ext in}	ASi-	+24V _{ext in}	n.c.
BWU2960	X1	S1	24V _{out of ASi}	OSSD2	0V _{out of ASi}	OSSD1	shield
	X2	S2	24V _{out of ASi}	n.c.	0V _{out of ASi}	24V _{out of ASi}	shield
	X3	O1	n.c.	O2	0V _{out of ASi}	O1	n.c.
	X4	O2	n.c.	n.c.	0V _{out of ASi}	O2	n.c.
	X5	ASI	ASi+	n.c.	ASi-	n.c.	n.c.



Connection examples BWU2270, BWU2370, BWU2689, BWU2960



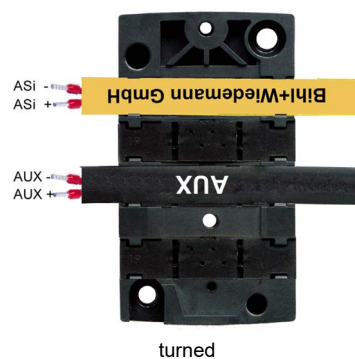
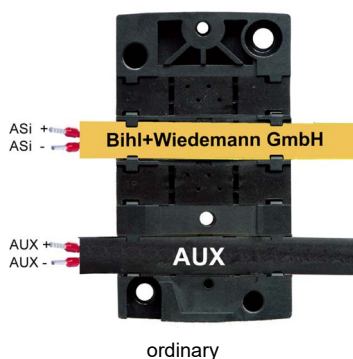
BWU2270, BWU2284, BWU2631, BWU2689, BWU2814:

The matching substructure modules are available as accessories with two different drilling patterns.

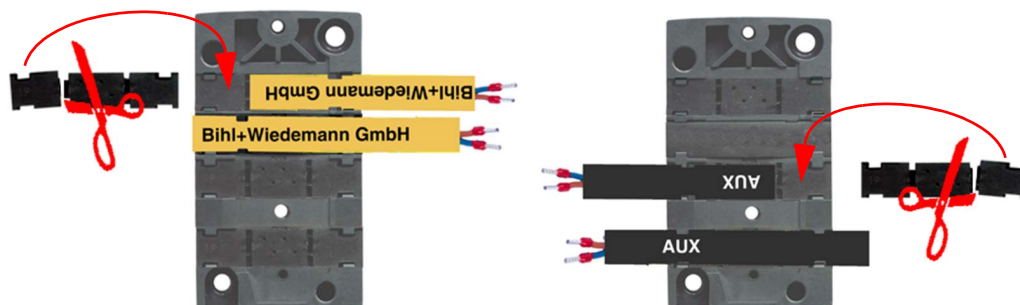
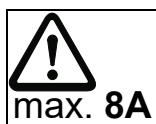
BWU2369, BWU2370, BWU2960:

They are supplied including mounted substructure modules (no additional profile cable connection possible)

Mounting according to cable direction



Line termination with sealing profiles / junction



Accessories:

- ASi substructure module for 4-channel module in 45 mm-housing (article no. BWU2349)
- ASi substructure module (CNOMO) for 4-channel module in 45 mm-housing (article no. BWU2350)
- Universal protection cap ASI-5/ASI-3 for M12 sockets, IP67 (art. no. BW4056)
- ASi-5/ASI-3 Address Programming Device (art. no. BW4925)
- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)

Accessories for BWU2369, BWU2960:

- 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)
- Passive Distributor ASi to 1 x M12 cable socket, angled, 5 poles, depth 19 mm, IP67 (art. no. BWU3185)
- Passive Distributor ASi to 1 x M12 cable socket, straight, 5 poles, depth 19 mm, IP67 (art. no. BWU3247)
- Universal protection cap ASi-5/ASi-3 for M12 sockets, IP67 (art. no. BW4056)
- ASi-5/ASi-3 Address Programming Device (art. no. BW4925)
- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)