ASi-5/ASi-3 AGV control unit with integrated Safety Monitor

ASi-5 - Great data bandwidth, short cycle times

Compatible with all ASi generations

(figure similar)

ASi-5/ASi-3 AGV control unit with integrated Safety Monitor, 1 ASi-5/ASi-3 Master

- up to 6 release circuits, 6 electronic safe outputs
- 8 standard inputs
- 6 standard outputs

EtherNet/IP™ (1) scanner

CIP Safety originator

2 Ethernet ports, connected internally by a switch

Control III integrated

REST API for IIoT applications

Safe speed and standstill monitoring

Recognition of duplicate ASi addresses

(1) EtherNet/IP™, CIP™ and CIP Safety™ are registered trademarks of ODVA® , Inc.

Figure	Interface, fieldbus	Outputs Safety, SIL 3, cat. 4	Inputs digital	Outputs digital	Safety communication	Number of ASi networks, number of ASi Master	Integrated decou-pling, ASi current measurement in the gateway	Art. no.
	EtherNet/IP	6 release circuits; 6 x electronic safe outputs	8	6 x electronic	CIP Safety over EtherNet/IP + Safe Link	1 ASi network, 1 ASi-5/ASi-3 master	yes, max. 2 A/ASi network	**BW4976**

Article no.	BW4976
Fieldbus interface	
Type	EtherNet/IP; 2 x RJ-45, integrated 2-Port-Switch, acc. to IEEE 802.3
Baud rate	10/100 MBaud
IT interface	REST API
Variably configurable Assembly Objects	yes
Safety communication	CIP Safety over EtherNet/IP + Safe Link
Function	Device Level Ring (DLR)
Diagnostic interface	
Type	Ethernet; RJ-45 acc. to IEEE 802.3
Baud rate	10/100 MBaud half-duplex or full-duplex
Safety communication	Safe Link
IT interface	REST API
Safe coupling (1)	yes

ASi-5/ASi-3 AGV control unit with integrated Safety Monitor

Article no.	BW4976
ASi	
ASi specification	ASi-5+ ASi-3
Number of ASi circuits, number of ASi master	1 ASi circuit, 1 ASi-5/ASi-3 master
Cycle time	**Cycle time ASi-3 (variable):** 150 µs * (number of ASi-3 nodes + 2)
	Cycle time ASi-5 (variable): 1,27 ms for 384 digital inputs + 384 digital outputs
Operating current	max. 300 mA out of 24 V_{ASi}
Current per ASi circuit	max. 2 A (integrated decoupling)
Length of the ASi line	max. 15 m (3)
ASi Safety	ASi-3 Safety compatible
Operating voltage	
Voltage	24 V_{DC} (19.2 ... 28.8 V)
Max current consumption	4,7 A (to be fused externally, connection via cable min. 20 AWG)
Display (2)	
LED ASi-5 (red/yellow/green)	green: ASi-5 Master in protection mode, no configuration error green flashing: ASi-5 configuration error, auto addressing active yellow: ASi-5 Master in projecting mode yellow flashing: ASi-5 peripheral fault red flashing: ASi-5 configuration error red: ASi-5 Master offline
LED ASi-3 (red/yellow/green)	green: ASi-3 Master in protection mode, no configuration error green flashing: ASi-3 configuration error, auto addressing active yellow: ASi-3 Master in projecting mode yellow flashing: ASi-3 peripheral fault red flashing: ASi-3 configuration error red: ASi-3 Master offline
LED SM (red/yellow/green)	green: Safety monitor in protection mode yellow: at least 1 device in status 'yellow' yellow flashing: at least 1 device in status 'yellow flashing' red flashing: at least 1 device in status 'red flashing'
LED Ctrl (red/green)	green: control III program running red: control III program stopped red flashing: control III program error
LED power (red/yellow/green)	green: power supply, >20 V yellow: power supply, >9 V <20 V red: power supply, < 9 V

Article no.	BW4976
Environment	
Applied standards	EN 12895 EN 60529 EN 61000-6-2 EN 61000-6-4 EN 62061, SIL3 EN 61508, SIL3 EN ISO 13849-1, PLe
	UL 61010
Ambient temperature	0 °C … +70 °C (4)
Storage temperature	-25 °C … +85 °C
Housing	aluminium, plastic
Pollution Degree	2
Protection category	IP20
Tolerable loading referring to humidity	according to EN 61131-2
Maximum tolerable shock and vibration stress	according to EN 61131-2
Voltage of insulation	≥500 V
Weight	600 g
Dimensions (W / H / D in mm)	116 / 40 / 152

(1) Safe data exchange between safe protocols (e.g. CIP Safety etc.).

(2) Note: All three LEDs can also be freely configured by the user through a control program.

(3) loop resistance ≤150 Ω

(4) The bottom of the housing must not exceed 40 °C.

Article no.	BW4976
Safety monitor	
Start delay	< 10 ms
Max. turn-off time	< 40 ms
Standstill monitors for local inputs	4 axes up to 50 Hz (1)
Speed monitors for local inputs	2 to 4 axes up to 400 Hz (2)
Connection	
Connection	Molex, Microfit
Length of connector cable	I/O: max. 15 m (3)
Input	
Inputs digital, EDM	8 standard inputs
Switching current	15 mA (T = 100 µs), continuously 4 mA at 24 V
Power supply	out of AUX
Sensor supply	–
Output	
Number of release circuits on the monitor	6
Outputs	6 x semiconductor outputs, max. contact load: max. 100 mA per output ∑ (SafeOut) = 0,6 A
	6 standard outputs, supplied by safe switch-off SO1 max. 350 mA per output, ∑ (Out) = 2,1 A
	4 additional analog outputs, supplied by safe switch-off SO2
Power supply (semiconductor outputs)	out of AUX
Output	short-circuit and overload protected according to EN 61131-2
Test pulse (semiconductor outputs)	if output is on: minimum interval between 2 test pulses: 250 ms; pulse width up to 1 ms

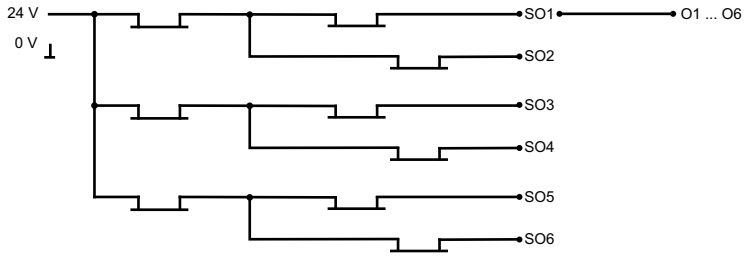
(1) connection at SO3 ... SO6 terminals possible.

(2) connection only at terminals SO3 ... SO6 configured as standard inputs (see „Connections“)

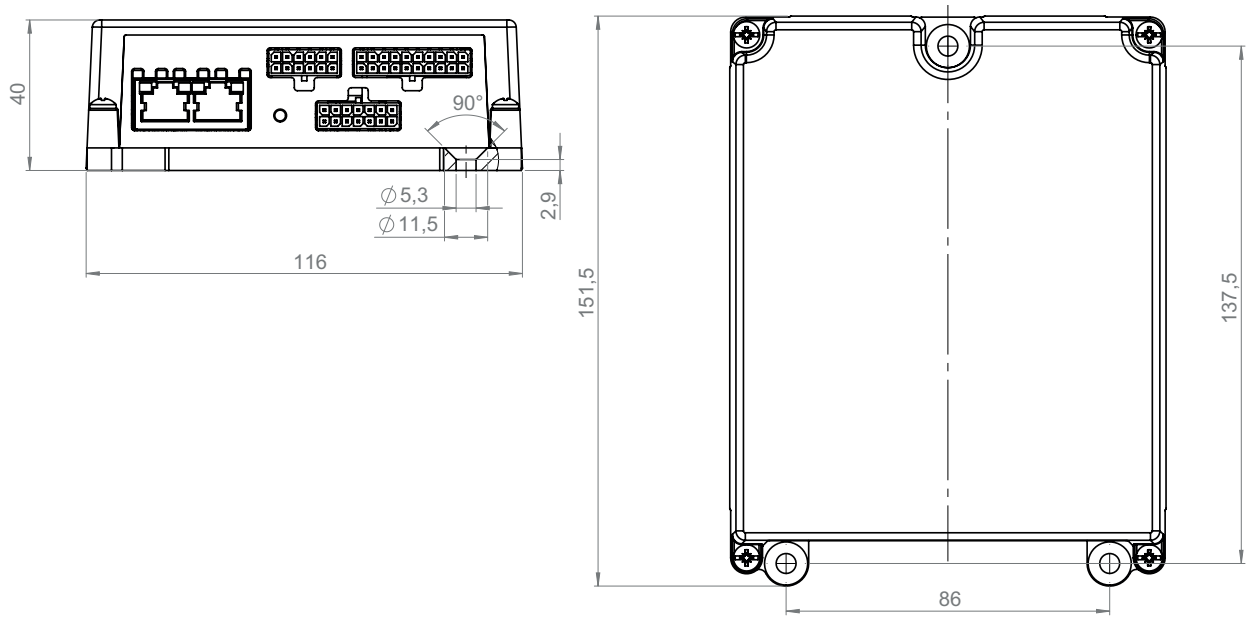
(3) loop resistance ≤150 Ω

	BW4976
Data decoupling integrated in the gateway	●
Current measurement of the ASi circuits	●
Self-resetting adjustable fuses	●

Safety outputs block diagram BW4976:



Dimensions BWU4976

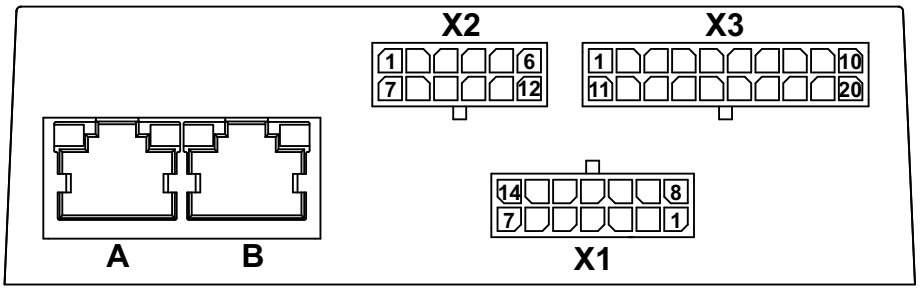


Pin assignment

Signal name	Explanation
Ix	digital input x
Ox	digital output x
O_{-n}	reference potential for outputs (PNP)
SOx	safe electronic output x
SO_{-n}	reference potential for safe electronic output
$24V_{ext\ in}$	power supply, out of external voltage, positive pole (AUX, actuator supply)
$0V_{ext\ in}$	power supply, out of external voltage, negative pole (AUX, actuator supply)
ASi+, ASi-	connection to ASi bus

CAN-H	CAN communication, plus pole
CAN-L	CAN communication, minus pole
ADDR	connection for ASi addressing device
n.c. (not connected)	not connected

Connections



X1 (Molex Microfit, 2 rows, 14 poles)						
Pin1	**Pin2**	**Pin3**	**Pin4**	**Pin5**	**Pin6**	**Pin7**
0 $V_{ext.in}$	ASi-	CAN-L	I1	I3	I5	I7
Pin8	**Pin9**	**Pin10**	**Pin11**	**Pin12**	**Pin13**	**Pin14**
24 $V_{ext.in}$	ASi+	CAN-H	I2	I4	I6	I8

X2 (Molex Microfit, 2 rows, 12 poles)					
Pin1	**Pin2**	**Pin3**	**Pin4**	**Pin5**	**Pin6**
O1	O2	O3	O4	O5	O6
Pin7	**Pin8**	**Pin9**	**Pin10**	**Pin11**	**Pin12**
$O\text{-}_1$ (1)	$O\text{-}_2$ (1)	$O\text{-}_3$ (1)	$O\text{-}_4$ (1)	$O\text{-}_5$ (1)	$O\text{-}_6$ (1)

X3 (Molex Microfit, 2 rows, 20 poles)									
Pin1	**Pin2**	**Pin3**	**Pin4**	**Pin5**	**Pin6**	**Pin7**	**Pin8**	**Pin9**	**Pin10**
$SO1_1$ (2)	$SO1_2$ (2)	$SO2_1$ (3)	$SO2_2$ (3)	$SO3_1$ (4)	$SO3_2$ (4)	$SO4_1$ (5)	$SO4_2$ (5)	SO5	$SO\text{-}_1$ (1)
Pin11	**Pin12**	**Pin13**	**Pin14**	**Pin15**	**Pin16**	**Pin17**	**Pin18**	**Pin19**	**Pin20**
$SO1_3$ (2)	$SO1_4$ (2)	$SO2_3$ (3)	$SO2_4$ (3)	$SO3_3$ (4)	$SO3_4$ (4)	$SO4_3$ (5)	$SO4_4$ (5)	SO6	$SO\text{-}_2$ (1)

A, B (RJ-45 acc. to IEEE 802.3): EtherNet/IP fieldbus interface

(1) $O\text{-}_1$...$O\text{-}_6$, $SO\text{-}_1$, $SO\text{-}_2$ internal bridged

(2) internal bridged

(3) internal bridged

(4) internal bridged

(5) internal bridged