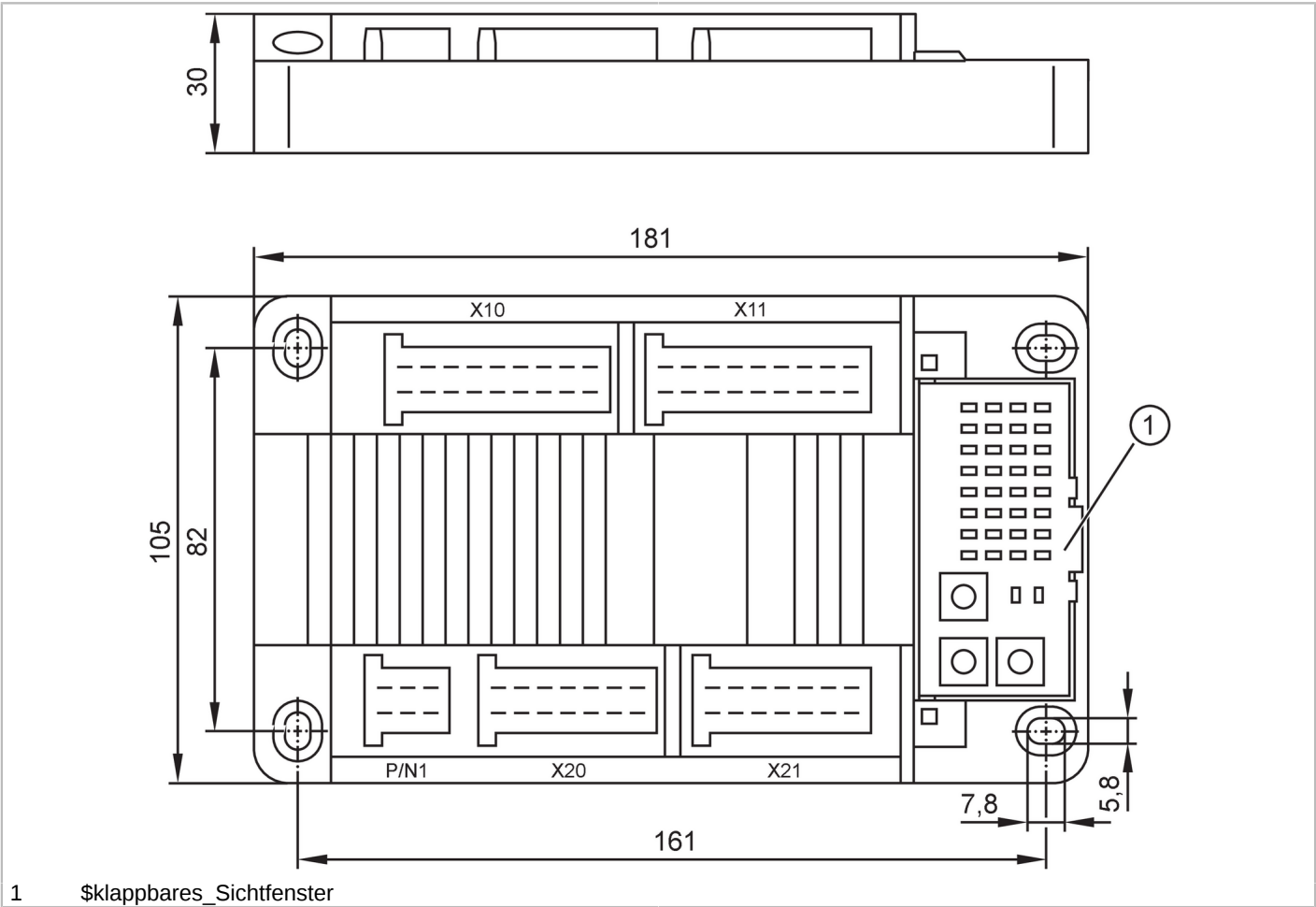




I/O modules for mobile machines

R360/CabinetModule/32I/0



Electrical data		
Operating voltage	[V]	10...32 DC
Nominal voltage DC	[V]	12 / 24
Current consumption	[mA]	< 125; (without load, 24 V DC)
Power consumption	[W]	4
Reverse polarity protection		yes; (in case of supply via the on-board system / battery)
Inputs / outputs		
Total number of inputs and outputs		32
Inputs		
Total number of inputs		16
Number of frequency inputs		4
Number of digital inputs		16
Number of analog inputs		4
Digital inputs, frequency inputs (BL, PWM)		
Number		4
Plug X10		IN01...IN04



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Digital input	function type	binary, low-side
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB
	Switching level low [V]	< 30 % VBB
	input frequency [Hz]	< 50
	input resistance [Ω]	3280
Frequency input	function type	Frequency
	input range [V]	0...32
	Frequency [Hz]	< 2000
	Switching level high [V]	> 30...50 % VBB
	Switching level low [V]	< 20 % VBB
	input resistance [Ω]	3280
	Accuracy	± 16 μs
Digital inputs (BL)		
Number	4	
Plug X10	IN05...IN08	
Digital input	function type	binary, low-side
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB
	Switching level low [V]	< 30 % VBB
	input frequency [Hz]	< 50
	input resistance [Ω]	3280
Digital inputs (BL/BH)		
Number	4	
Plug X11	IN09...IN12	
Digital input	function type	binary, high-side
		binary, low-side
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB
	Switching level low [V]	< 30 % VBB
	input frequency [Hz]	< 50
	input resistance [Ω]	3132
Analog inputs (A, BH)		
Number	4	
Plug X11	A_IN01...A_IN04	
Analog input	function type	Voltage
	input range [V]	0...10
	input resistance [Ω]	61600
	Resolution	12 Bit
	Accuracy	± 1 % FS
	input frequency [Hz]	< 50
Analog input	function type	Voltage
	input range [V]	0...32
	input resistance [Ω]	48400
	Resolution	12 Bit
	Accuracy	± 1 % FS
	input frequency [Hz]	< 50



I/O modules for mobile machines

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Analog input	function type	Current
	input range [mA]	0...20
	input resistance [Ω]	383
	Resolution	12 Bit
	Accuracy	± 1 % FS
	input frequency [Hz]	< 50
Analog input	function type	Voltage, ratiometric
	input range [V]	0...32
	input resistance [Ω]	48400
	Accuracy	± 2 % FS
	input frequency [Hz]	< 50
Digital input	function type	binary, high-side
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB
	Switching level low [V]	< 30 % VBB
	input frequency [Hz]	< 50
	input resistance [Ω]	49690
Outputs		
Total number of outputs	16	
Number of digital outputs	16	
Number of PWM outputs	16	
Output group (Group 1)		
Number	1	
Plug X20	VBB01	
Output group switch	Voltage range [V]	10...32
	Current rating [A]	16
Output group (Group 2)		
Number	1	
Plug X21	VBB02	
Output group switch	Voltage range [V]	10...32
	Current rating [A]	16
Digital / PWM outputs		
Number	4	
Plug X20	OUT01...OUT04	
Digital output	function type	binary, high-side
	Voltage range [V]	10...32
	switching current [A]	0,1...2,0
	Min. load resistance [Ω]	12 V: 6 Ω / 24 V: 12 Ω
	protective circuitry	inductive load; thermal protection
	Diagnostic function	wire break (< 25 kΩ); short circuit; current monitoring



I/O modules for mobile machines

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PWM output	function type	binary, high-side
	Voltage range [V]	10...32
	switching current [A]	0,01..2,0
	output frequency [Hz]	20...250
	pulse/pause ratio	0...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 6 Ω / 24 V: 12 Ω
	protective circuitry	inductive load; thermal protection
Diagnostic functions		wire break (< 25 k Ω); short circuit; current monitoring

Digital / PWM outputs

Number	12	
Plug X20	OUT01...OUT04	
Plug X21	OUT09...OUT16	
Digital output	function type	binary, high-side
	Voltage range [V]	10...32
	switching current [A]	0,1...2,0
	Min. load resistance [Ω]	12 V: 6 Ω / 24 V: 12 Ω
	protective circuitry	inductive load; thermal protection
	Diagnostic function	wire break; short circuit; current monitoring
PWM output	function type	binary, high-side
	Voltage range [V]	10...32
	switching current [A]	0,01..2,0
	output frequency [Hz]	100
	pulse/pause ratio	0...1000 ‰; (configurable)
	Resolution	100 ‰
	Min. load resistance [Ω]	12 V: 6 Ω / 24 V: 12 Ω
	protective circuitry	inductive load; thermal protection
Diagnostic functions		wire break; short circuit; current monitoring

Software / programming

Parameter setting options	CODESYS 2.3; CODESYS 3.5; (EDS)
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Interfaces

Communication interface	CAN
Number of CAN interfaces	1
Transmission rate	20 kBit/s... 1 MBit/s
Protocol	CANopen
Profile	CiA DS 301 v. 4.02; CiA DS 401 v. 2.1
Interface	CAN Interface 2.0 A/B ISO 11898
Factory settings	Transmission rate: 125 kBit/s
	Node-ID: 20 (hexadecimal), 32 (decimal)

Operating conditions

Ambient temperature	[°C]	-40...60
Note on ambient temperature	for further details see section Diagrams and graphs	
Storage temperature	[°C]	-40...85
Max. relative air humidity	[%]	90; (non condensing)
Max. height above sea level	[m]	2000
Protection	IP 20	



I/O modules for mobile machines

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Pollution degree		2
Tests / approvals		
EMC	UN/ECE-R10 Noise emission and noise interference:	100 V/m
	DIN EN 61326	noise emission, noise immunity
	ISO 7637-2 pulse 1	severity level 4 / function state C (24 V)
	ISO 7637-2 pulse 2a	severity level 4 / function state A (24 V)
	ISO 7637-2 pulse 2b	severity level 4 / function state C (24 V)
	ISO 7637-2 pulse 3a	severity level 4 / function state A (24 V)
	ISO 7637-2 pulse 3b	severity level 4 / function state A (24 V)
	ISO 7637-2 pulse 4	severity level 4 / function state B (24 V)
	ISO 7637-2 pulse 5	\$Schaerfegrad_1 / function state A (24 V)
	ISO 7637-2 pulse 4	severity level 4 / function state B (12 V)
Vibration resistance	EN 60068-2-30 Test Db	≤ 95 % relative humidity, non condensing
	EN 60068-2-6 Test Fc	vibration
	EN 60068-2-27 Test Ea	shock
Climatic tests	EN 60068-2-30 damp heat: cyclical	55 °C upper temperature limit / 6 cycles
	EN 60529	protection rating test
MTTF	[years]	102
Railway applications	EN 50155 Pkt. 13.3	mechanical/climatic test
	EN 50121-3-2	EMC, noise emission, noise immunity
	BN 411 002	DIN EN 50155 Pkt. 10.2 / DIN EN 50121
Mechanical data		
Weight	[g]	501.2
Housing		rectangular
Type of mounting		screw mounting; (bore hole: 4 x M4)
Dimensions	[mm]	181 x 105 x 30
Material		housing: plastics black
Displays / operating elements		
Display	Power (PWR)	1 LED, green
	diagnosis (DIA)	1 LED, red
	Inputs / outputs	32 LED, yellow
Operating elements	S1	Baudrate (0 kBit/s...1000 kBit/s)
	S2	Node-ID, High-Nibble
	S3	Node-ID, Low-Nibble
Hardware		
Processor		STM32
Accessories		
Items supplied		screws: 4 x M4, (DIN 912, DIN 7984)
		tubular rivets: 4, (DIN 7984)
Remarks		
Pack quantity		1 pcs.

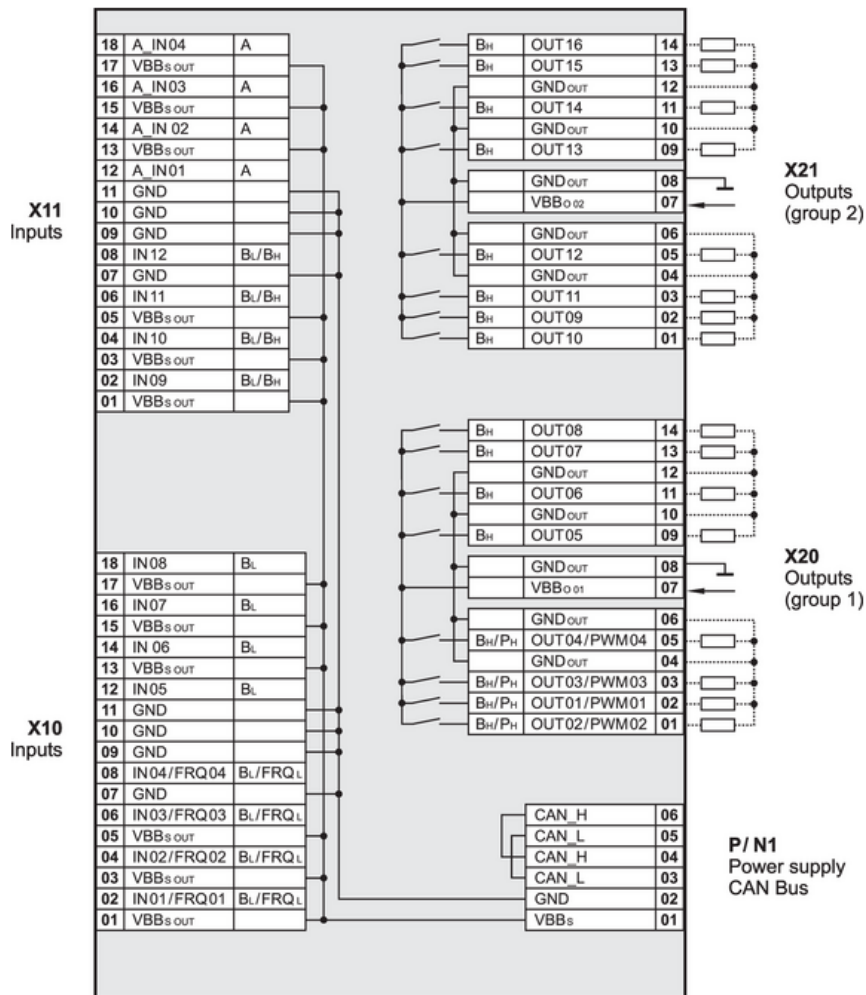


I/O modules for mobile machines

R360/CabinetModule/32I/O

Electrical connection

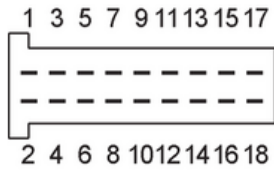
Connection



- A analog
- B_L binary, low-side (CSI)
- B_H binary, high-side (CSO)
- FRQ_L frequency inputs
- PH pulse width modulation, high-side
- PWM pulse width modulation
- VBB_S voltage supply, controller, sensors
- VBB_O voltage supply, Outputs

Electrical connection - Inputs

Connector: 2 x AMP-Junior Timer (18-pole); lockable and with reverse polarity protection





I/O modules for mobile machines

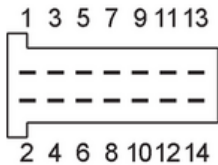
R360/CabinetModule/32I/0

digital / frequency inputs X10	
1	VBBs OUT
2	IN01 / FRQ01
3	VBBs OUT
4	IN02 / FRQ02
5	VBBs OUT
6	IN03 / FRQ03
7	GND
8	IN04 / FRQ04
9	GND
10	GND
11	GND
12	IN05
13	VBBs OUT
14	IN06
15	VBBs OUT
16	IN07
17	VBBs OUT
18	IN08

digital / analogue inputs X11	
1	VBBs OUT
2	IN09
3	VBBs OUT
4	IN10
5	VBBs OUT
6	IN11
7	GND
8	IN12
9	GND
10	GND
11	GND
12	A_IN01
13	VBBs OUT
14	A_IN02
15	VBBs OUT
16	A_IN03
17	VBBs OUT
18	A_IN04

Electrical connection - Outputs

Connector: 2 x AMP-Junior Timer (14-pole); lockable and with reverse polarity protection





I/O modules for mobile machines

R360/CabinetModule/32I/0

digital / PWM outputs X20

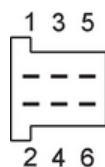
1	OUT02 / PWM02
2	OUT01 / PWM01
3	OUT03 / PWM03
4	GND OUT
5	OUT04 / PWM04
6	GND OUT
7	VBB01
8	GND OUT
9	OUT05
10	GND OUT
11	OUT06
12	GND OUT
13	OUT07
14	OUT08

digital outputs X21

1	OUT10
2	OUT09
3	OUT11
4	GND OUT
5	OUT12
6	GND OUT
7	VBB02
8	GND OUT
9	OUT13
10	GND OUT
11	OUT14
12	GND OUT
13	OUT15
14	OUT16

Electrical connection - CAN

Connector: 1 x AMP-Junior Timer (6-wire); lockable and with reverse polarity protection

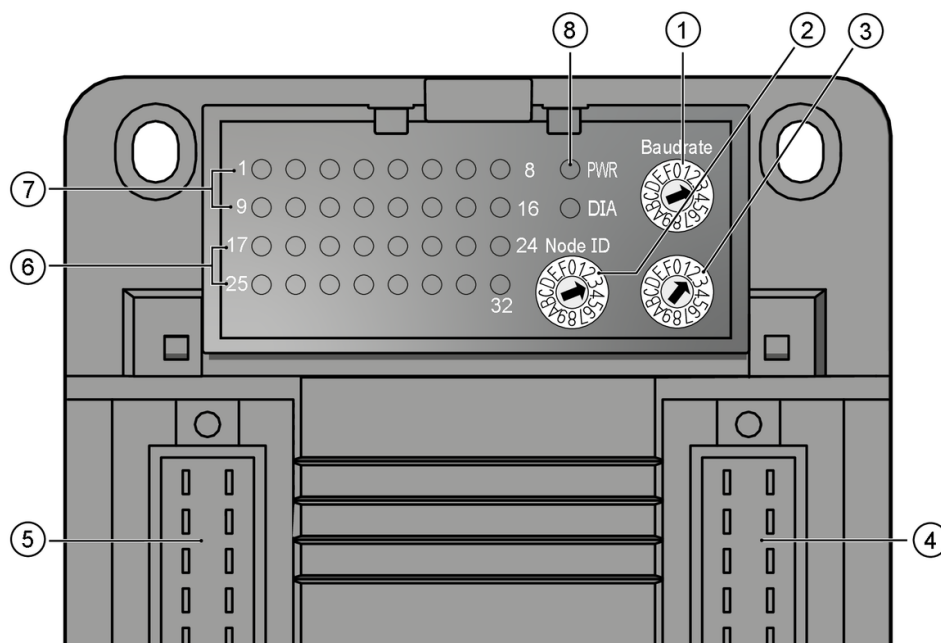


supply, CAN interface P/N1

1	VBBs
2	GND
3	CAN_L
4	CAN_H
5	CAN_L
6	CAN_H

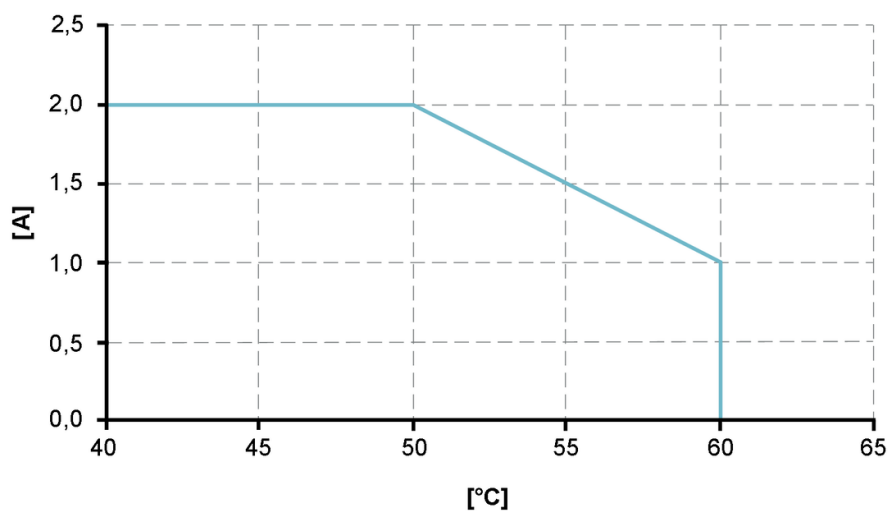
Diagrams and graphs

application note relevant for the function



- 1: Rotary switch Baud rate hexadecimal
- 2: Rotary switch node ID High-Nibble hexadecimal
- 3: Rotary switch node ID Low-Nibble hexadecimal
- 4: AMP Crimp connector Outputs
- 5: AMP Crimp connector Inputs
- 6: LEDs 17...32 OUT
- 7: LEDs 1...16 IN
- 8: LEDs PWR/ DIA

Characteristic curve for derating



characteristic curve with 70 % of inputs and outputs active

[A] current per active output

[°C] Ambient temperature