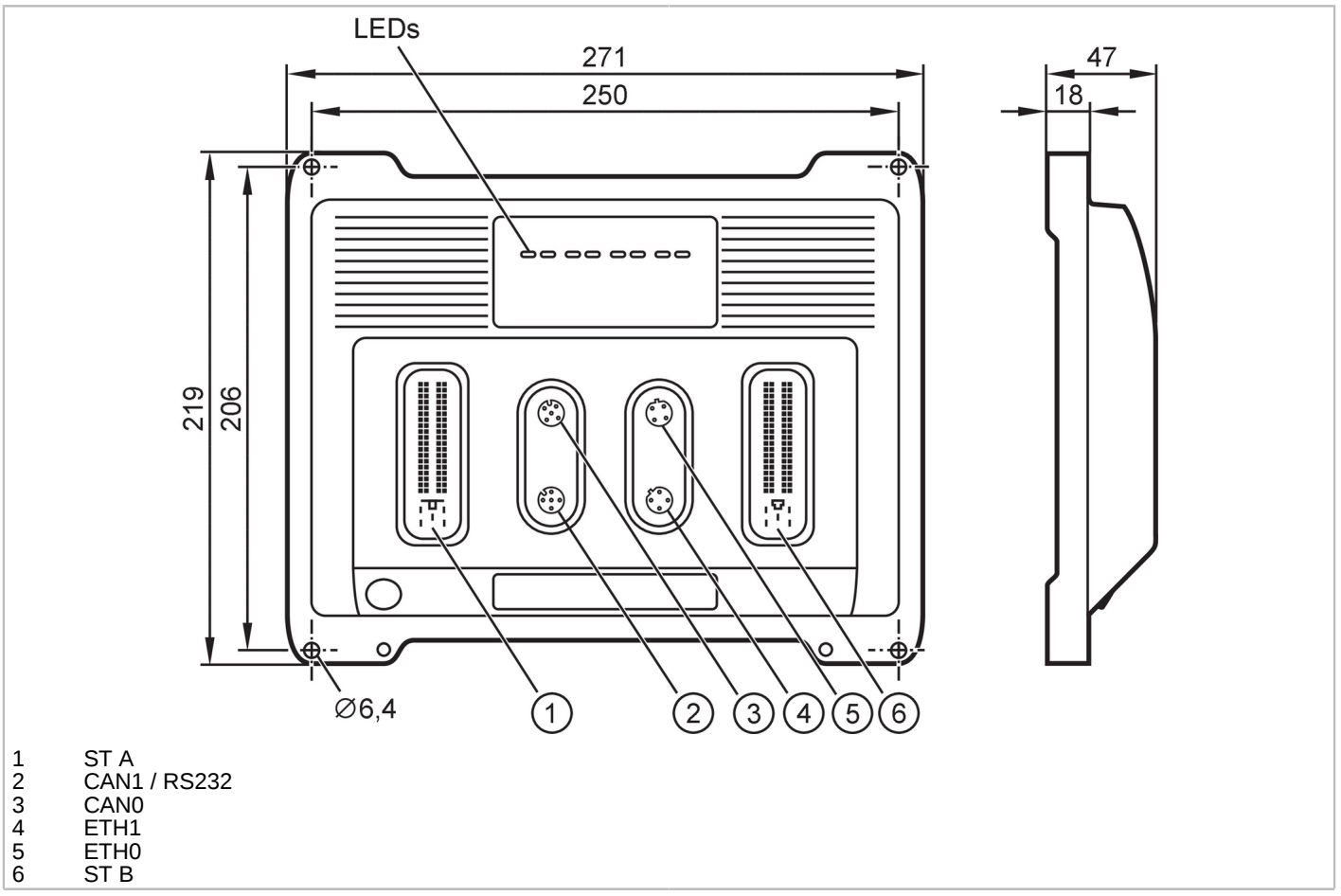
CR721S

Programmable controller for mobile machines

ecomatController/124



1 ST A
2 CAN1 / RS232
3 CAN0
4 ETH1
5 ETH0
6 ST B

Product characteristics		
Total number of inputs		68
Total number of outputs		56
Communication interface		Ethernet; CAN; RS232
Protection		IP 65; IP 67; (for inserted connectors with individually sealed cores and inserted M12 connectors or sealing caps: IP 67)
Electrical data		
Operating voltage	[V]	8...32 DC; (VBB15, VBB30 voltage monitoring)
Nominal voltage DC	[V]	12 / 24
Power consumption	[W]	12; (VBB30)
Reverse polarity protection		yes; (in case of supply via the on-board system / battery)
Inputs / outputs		
Total number of inputs and outputs		124
Inputs		
Total number of inputs		68
Number of frequency inputs		16
Number of resistor inputs		4
Number of digital inputs		68

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Number of analog inputs	40	
Digital inputs, frequency signal (IN FREQUENCY-B)		
Number	16	
Plug ST A	IN0000...IN0003	
	IN0500...IN0503	
Plug ST B	IN1000...IN1003	
	IN1500...IN1503	
Frequency input	function type	Frequency, cycle time
	software mode	IN_PERIOD_RATIO_CSO
		IN_PERIOD_RATIO_CSI
	input range [V]	0...32
	Frequency [Hz]	0,01...5000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs
Frequency input	function type	Frequency, cycle time
	software mode	IN_PERIOD_RATIO_US_CSO
		IN_PERIOD_RATIO_US_CSI
	input range [V]	0...32
	Frequency [Hz]	0,1...5000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs
Frequency input	function type	Frequency, cycle time
	software mode	IN_FREQUENCY_CSO
		IN_FREQUENCY_CSI
	input range [V]	0...32
	Frequency [Hz]	0,5...30000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs
Frequency input	function type	pulse
	software mode	IN_COUNT_CSO
		IN_COUNT_CSI
	input range [V]	0...32
	Frequency [Hz]	0...30000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs

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Frequency input	function type	pulse, incremental
	software mode	IN_INC_ENCODER_CSO
		IN_INC_ENCODER_CSI
	input pair ST A	A: IN0000 + B: IN0001
		A: IN0002 + B: IN0003
		A: IN0500 + B: IN0501
		A: IN0502 + B: IN0503
	input pair ST B	A: IN1000 + B: IN1001
		A: IN1002 + B: IN1003
		A: IN1500 + B: IN1501
		A: IN1502 + B: IN1503
	input range [V]	0...32
	Frequency [Hz]	0...5000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs
Frequency input	function type	phase
	software mode	IN_PHASE_CSO
		IN_PHASE_CSI
	input pair ST A	A: IN0000 + B: IN0001
		A: IN0002 + B: IN0003
		A: IN0500 + B: IN0501
		A: IN0502 + B: IN0503
	input pair ST B	A: IN1000 + B: IN1001
		A: IN1002 + B: IN1003
		A: IN1500 + B: IN1501
		A: IN1502 + B: IN1503
	input range [V]	0...32
	Frequency [Hz]	0,0625...5000
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	input resistance [Ω]	10000
	Accuracy	± 10 µs
Analog input	function type	Voltage
	software mode	IN_VOLTAGE_10
	input range [V]	0...10
	input resistance [Ω]	87600
	Resolution	12 Bit
	Accuracy	± 100 mV
	input frequency [Hz]	< 330
	diagnostic level low	0 V; (configurable)
	diagnostic level high	10 V; (configurable)

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Digital input	function type	binary, high-side
	software mode	IN_DIGITAL_CSO
	input range [V]	0...32
	Switching level high [V]	> 65 % VBB30; (configurable)
	Switching level low [V]	< 25 % VBB30; (configurable)
	Resolution	12 Bit
	Accuracy	± 960 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	10000
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	100 % VBB30; (configurable)
Digital input	function type	binary, low-side
	software mode	IN_DIGITAL_CSI
		IN_DIGITAL_CSI_NAMUR
		IN_DIGITAL_CSI_BLANKING
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB30; (configurable)
	Switching level low [V]	< 30 % VBB30; (configurable)
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	9500
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	400 % VBB30; (configurable)
Multifunction inputs, analog / digital (IN MULTIFUNCTION-A)		
Number		24
Plug ST A		IN0100...IN0103
		IN0200...IN0203
		IN0600...IN0603
		IN0700...IN0703
Plug ST B		IN1100...IN1103
		IN1600...IN1603
Analog input	function type	Current
	software mode	IN_CURRENT_CSI
	input range [mA]	0...20
	input resistance [Ω]	298
	Resolution	12 Bit
	Accuracy	± 345 µA
	input frequency [Hz]	< 330
	diagnostic level low	0 mA; (configurable)
	diagnostic level high	20 mA; (configurable)
Analog input	function type	Voltage
	software mode	IN_VOLTAGE_10
	input range [V]	0...10
	input resistance [Ω]	67600
	Resolution	12 Bit
	Accuracy	± 100 mV
	input frequency [Hz]	< 330
	diagnostic level low	0 V; (configurable)
	diagnostic level high	10 V; (configurable)

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Analog input	function type	Voltage
	software mode	IN_VOLTAGE_32
	input range [V]	0...32
	input resistance [Ω]	51000
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	diagnostic level low	0 V; (configurable)
	diagnostic level high	32 V; (configurable)
Analog input	function type	Voltage, ratiometric
	software mode	IN_VOLTAGE_RATIO
	input range [V]	0...1000 ‰ VBB30
	input resistance [Ω]	51000
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	diagnostic level low	0 ‰; (configurable)
	diagnostic level high	1000 ‰; (configurable)
Digital input	function type	binary, low-side
	software mode	IN_DIGITAL_CSI
		IN_DIGITAL_CSI_NAMUR
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	9500
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	400 % VBB30; (configurable)
Digital / resistor inputs (IN RESISTOR-A)		
Number		4
Plug ST A		IN0400...IN0401
		IN0900...IN0901
Digital input	function type	binary, low-side
	software mode	IN_DIGITAL_CSI
		IN_DIGITAL_CSI_NAMUR
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB30; (configurable)
	Switching level low [V]	< 30 % VBB30; (configurable)
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	3200
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	400 % VBB30; (configurable)

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Resistor input	function type	binary, high-side
	software mode	IN_RESISTOR
	input range [Ω]	16...30000
	measuring current [mA]	< 2,0
	Resolution	12 Bit
	Accuracy	16...3000 Ω: ± 60 Ω
		3000...15000 Ω: ± 750 Ω
		15000...30000 Ω: ± 3000 Ω
	diagnostic level low	0 Ω; (configurable)
	diagnostic level high	30000 Ω; (configurable)
Digital inputs (IN DIGITAL-A)		
Number		16
Plug ST B		IN1200...IN1203
		IN1400...IN1403
		IN1700...IN1703
		IN1800...IN1803
Digital input	function type	binary, low-side
	software mode	IN_DIGITAL_CSI
		IN_DIGITAL_CSI_NAMUR
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB30; (configurable)
	Switching level low [V]	< 30 % VBB30; (configurable)
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	10000
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	400 % VBB30; (configurable)
Digital inputs (IN DIGITAL-B)		
Number		8
Plug ST A		IN0300, IN0301
		IN0800, IN0801
Plug ST B		IN1300...IN1303
Digital input	function type	binary, low-side
	software mode	IN_DIGITAL_CSI
		IN_DIGITAL_CSI_NAMUR
	input range [V]	0...32
	Switching level high [V]	> 70 % VBB30; (configurable)
	Switching level low [V]	< 30 % VBB30; (configurable)
	Resolution	12 Bit
	Accuracy	± 320 mV
	input frequency [Hz]	< 330
	input resistance [Ω]	3200
	diagnostic level low	0 % VBB30; (configurable)
	diagnostic level high	400 % VBB30; (configurable)
Reset (RESET-COM)		
Number		1
Plug ST A		PIN 72

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Digital input	Switching level high [V]	> 70 % VBB30
	Switching level low [V]	< 30 % VBB30
	Accuracy	± 5 % FS
Outputs		
Total number of outputs	56	
Number of digital outputs	54	
Number of analog outputs	2	
Number of PWM outputs	54	
Number of PWM-I outputs	36	
Number of outputs with H-bridge	6	
Output groups (OutputGroup-A)		
Number	6	
Plug ST A	VBB0...VBB2	
Plug ST B	VBB3...VBB5	
Output group switch	function type	second independent switch-off mode of the output group
	software mode	OUT_DIGITAL_VIRT
	Voltage range [V]	6...32 DC
	voltage measurement [V]	0...36
	voltage measurement accuracy [mV]	± 360
	Current rating [A]	12
	accuracy of the current measurement [mA]	± 600
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	12000; (configurable)
Digital / PWM outputs; 4,0 A; H bridge (OUT PWM-40-BRIDGE-A)		
Number	12	
Plug ST A	OUT0006, OUT0007	
	OUT0106, OUT0107	
	OUT0206, OUT0207	
Plug ST B	OUT0306, OUT0307	
	OUT0406, OUT0407	
	OUT0506, OUT0507	
PWM output	function type	binary, high-side
	software mode	OUT_PWM_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	output frequency [Hz]	20...1000
	pulse/pause ratio	1...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)

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PWM output	function type	binary, low-side
	software mode	OUT_PWM_CSI
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	output frequency [Hz]	20...500
	pulse/pause ratio	1...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
PWM-I output	function type	current-controlled
	software mode	OUT_CURRENT_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	output frequency [Hz]	20...1000
	control range [A]	0,05...4
	setting resolution [mA]	1
	control resolution [mA]	2
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)
Digital output	function type	binary, high-side
	software mode	OUT_DIGITAL_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	switching status monitoring [V]	2
	switching status monitoring accuracy [V]	± 1
	Diagnostic function	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)
Digital output	function type	binary, low-side
	software mode	OUT_DIGITAL_CSI
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60

Digital / PWM outputs; 4,0 A (OUT PWM-40-A)	
Number	6
Plug ST A	OUT0008, OUT0108, OUT0208

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Plug ST B	OUT0308, OUT0408, OUT0508	
PWM output	function type	binary, high-side
	software mode	OUT_PWM_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	output frequency [Hz]	20...2000
	pulse/pause ratio	1...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)
PWM-I output	function type	current-controlled
	software mode	OUT_CURRENT_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	output frequency [Hz]	20...2000
	control range [A]	0,05...4
	setting resolution [mA]	1
	control resolution [mA]	2
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)
Digital output	function type	binary, high-side
	software mode	OUT_DIGITAL_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...4
	Min. load resistance [Ω]	12 V: 3 Ω / 24 V: 6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...6
	accuracy of the current measurement [mA]	± 60
	switching status monitoring [V]	2
	switching status monitoring accuracy [V]	± 1
	Diagnostic function	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	4000; (configurable)
Digital / PWM outputs; 2,5 A (OUT PWM-25-A)		
Number	18	
Plug ST A	OUT0000, OUT0002, OUT0004	
	OUT0100, OUT0102, OUT0104	
	OUT0200, OUT0202, OUT0204	

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Plug ST B	OUT0300, OUT0302, OUT0304	
	OUT0400, OUT0402, OUT0404	
	OUT0500, OUT0502, OUT0504	
PWM output	function type	binary, high-side
	software mode	OUT_PWM_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...2,5
	output frequency [Hz]	20...2000
	pulse/pause ratio	1...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 4,8 Ω / 24 V: 9,6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...4
	accuracy of the current measurement [mA]	± 37,5
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
PWM-I output	function type	current-controlled
	software mode	OUT_CURRENT_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...2,5
	output frequency [Hz]	20...2000
	control range [A]	0,05...2,5
	setting resolution [mA]	1
	control resolution [mA]	2
	Min. load resistance [Ω]	12 V: 4,8 Ω / 24 V: 9,6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...4
	accuracy of the current measurement [mA]	± 37,5
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
Digital output	function type	binary, high-side
	software mode	OUT_DIGITAL_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...2,5
	Min. load resistance [Ω]	12 V: 4,8 Ω / 24 V: 9,6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...4
	accuracy of the current measurement [mA]	± 37,5
	switching status monitoring [V]	2
	switching status monitoring accuracy [V]	± 1
	Diagnostic function	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
Digital / PWM outputs; 2,5 A (OUT PWM-25-B)		
Number	18	
Plug ST A	OUT0001, OUT0003, OUT0005	
	OUT0101, OUT0103, OUT0105	
	OUT0201, OUT0203, OUT0205	

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Plug ST B	OUT0301, OUT0303, OUT0305	
	OUT0401, OUT0403, OUT0405	
	OUT0501, OUT0503, OUT0505	
PWM output	function type	binary, high-side
	software mode	OUT_PWM_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...2,5
	output frequency [Hz]	20...2000
	pulse/pause ratio	1...1000 ‰; (configurable)
	Resolution	1 ‰; (20...250 Hz)
	Min. load resistance [Ω]	12 V: 4,8 Ω / 24 V: 9,6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...4
	accuracy of the current measurement [mA]	± 125
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
Digital output	function type	binary, high-side
	software mode	OUT_DIGITAL_CSO
	Voltage range [V]	6...32 DC
	switching current [A]	0,025...2,5
	Min. load resistance [Ω]	12 V: 4,8 Ω / 24 V: 9,6 Ω
	protective circuitry	inductive load; thermal protection
	current measurement [A]	0...4
	accuracy of the current measurement [mA]	± 125
	switching status monitoring [V]	2
	switching status monitoring accuracy [V]	± 1
	Diagnostic function	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
Sensor supply (OUT SUPPLY-A)		
Number	1	
Plug ST A	OUT3000	
Sensor supply	function type	voltage supply
	software mode	OUT_SENSOR_05
	Output voltage [V]	5
	Accuracy [mV]	± 600
	min. load current [mA]	10
	max. load current [mA]	400
	current measurement [A]	0...2,5
	accuracy of the current measurement [mA]	± 125
	voltage measurement [V]	0...10
	voltage measurement accuracy [mV]	± 500
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)

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Sensor supply	function type	voltage supply
	software mode	OUT_SENSOR_10
	Output voltage [V]	10
	Accuracy [mV]	± 600
	min. load current [mA]	10
	max. load current [mA]	200
	current measurement A	0...2,5
	accuracy of the current measurement [mA]	± 125
	voltage measurement [V]	0...10
	voltage measurement accuracy [mV]	± 500
	Diagnostic functions	wire break; short circuit; current monitoring
	lower limit of current monitoring [mA]	0; (configurable)
	upper limit of current monitoring [mA]	2500; (configurable)
Analog outputs (OUT VOLTAGE-A)		
Number	2	
Plug ST A	OUT3001	
Plug ST B	OUT3002	
Analog output	function type	Voltage
	software mode	OUT_ANALOG_10
	Voltage range [V]	0...10 DC
	Accuracy [mV]	± 500
	Current rating [mA]	5
	step response time [ms]	< 1,8 (10...90 %)
	voltage measurement [V]	0...10
	voltage measurement accuracy [mV]	± 500
Software / programming		
Parameter setting options	CODESYS 3.5	
PLC function to IEC 61131-3	yes	
Operating system	real-time operating system	
Interfaces		
Communication interface	Ethernet; CAN; RS232	
Number of CAN interfaces	4	
Number of Ethernet interfaces	2	
Number of R232 interfaces	1	
CAN		
Transmission rate	20 kBit/s... 1 MBit/s	
Protocol	CANopen; SAE J1939; CANopen Safety	
Interface	CAN Interface 2.0 A/B ISO 11898	
Ethernet		
Transmission standard	10Base-T; 100Base-TX	
Transmission rate	10 MBit/s; 100 MBit/s	
Protocol	TCP/IP; UDP/IP; Modbus TCP	
Note on interfaces	2 ports with integrated switch	
RS-232 service interface		
Transmission rate	9,6...115,2 kBit/s	

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Operating conditions			
Housing temperature	[°C]	-40...85	
Storage temperature	[°C]	-40...85	
Max. relative air humidity	[%]	90; (non condensing)	
Max. height above sea level	[m]	3000	
Protection		IP 65; IP 67; (for inserted connectors with individually sealed cores and inserted M12 connectors or sealing caps: IP 67)	
Pollution degree		2	
Chemical media		ISO 16750-5	AA, BB, BD, CC, DB, DC, DD, ED
			only one chemical permitted at a time
Tests / approvals			
EMC		UN/ECE-R10 Noise emission and noise interference:	100 V/m
		DIN EN 61000-6-2	noise immunity
		DIN EN 61000-6-4	noise emission
		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 A (24 V)
		ISO 7637-2 pulse 5	severity level 3 / function state A (24 V)
		ISO 7637-2 pulse 4	severity level 4 / function state A (12 V)
		EN 45545-2	
		EN 50121-3-2	
Continuous shock resistance		ISO 16750-3	30 g 6 ms / 24000 shocks
Vibration resistance		ISO 16750-3 Test VII	random, mounting place car body
		EN 60068-2-6 sine	10...500 Hz / 10 cycles/axis, sine
Climatic tests		EN 60068-2-30 damp heat: cyclical	55 °C upper temperature limit / 6 cycles
		EN 60068-2-78 damp heat: constant	40 °C 93 % rH / test period 21 days
Salt spray test		EN 60068-2-52 Salt spray	severity level 3 / motor vehicle
Electrical safety		IEC 61010-1	safety requirements: general requirements
		IEC 61010-2-201	safety requirements: particular requirements for control equipment
Safety classification			
Complies with the requirements		ISO 13849-1 PL d	
		IEC 61508 SIL 2	
		IEC 62061 SIL 2	
		ISO 25119 AgPLd	
		ISO 26262 ASIL C	
According to IEC 61508			
MIssion time TM		20 years	
PFH [1/h]		external one-channel input	4.0E-09
		external two-channel input	5.0E-10
		logic	1,0E-07
		external one-channel output	2.0E-08
		external two-channel output	1.0E-09

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According to ISO 26262			
Total Life Time		20 years	
TTrip		10 h	
Typical use case		PMFH: 48 Fit	this classification applies to the following assumption:
			TLifetime (Total Operating Hours) = 40000 h
			(operating and non-operating phase of the device considered)
			(this is equivalent to operation for 20 years, 8 h a day on 250 days of the year or 10 h a day on 200 days)
Worst case		PMFH: 73 Fit	this classification applies to the following assumption:
			"always on"
			(non-operating phase of the device not considered)
Mechanical data			
Weight	[g]	1921.5	
Housing		rectangular	
Type of mounting		screw mounting; (4 x M6)	
Dimensions	[mm]	219 x 271 x 47	
Material		housing: diecast aluminium powder-coated	
Displays / operating elements			
Display		Ethernet (ETH0)	1 LED, green
		Ethernet (ETH1)	1 LED, green
		status (SYS0)	1 LED, multi-color
		status (SYS1)	1 LED, multi-color
		status (APP0)	1 LED, multi-color programmable
		status (APP1)	1 LED, multi-color programmable
		status (APP2)	1 LED, multi-color programmable
		status (APP3)	1 LED, multi-color programmable
Operating states - system / hardware			
Display		no operating system loaded	LED (SYS0), green flashing 5 Hz
		hardware error fatal error+	LED (SYS0), red lights
		system error fatal error	LED (SYS0/SYS1), red lights
		update	LED (SYS0/SYS1), yellow/green flashing 2 Hz
		sleep mode	LED (SYS0), blue lights
PLC application (SYS0 / SYS1)			
Display		no application	LED, green lights
		run	LED, green flashing 2 Hz
		fault	LED, red flashing 10 Hz
		debug run	LED, yellow flashing 2 Hz
		debug stop	LED, yellow lights
Ethernet (ETH0)			
Display		connection	LED, green lights
		Data transmission	LED, green flashing

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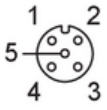
Hardware	
Processor	32-Bit Triple-Core
Working memory	2,7 MByte RAM
Mass storage	9 MByte Flash
Non-volatile memory	10 kByte
Boot time	< 3 s

Accessories	
Items supplied	Protective cap: M12
	self-tapping screw: 1 x M4, for shield connection

Remarks	
Remarks	the maximum height above sea level is 5000 m in case of supply via the battery / on-board system
	can be used in applications up to SIL 2 in accordance with IEC 62061
	can be used in applications up to PL d in accordance with ISO 13849-1
	can be used in applications up to AgPL d in accordance with ISO 25119
	can be used in applications in accordance with DIN EN ISO 13766-2
Pack quantity	1 pcs.

Electrical connection - CAN

Connector: 1 x M12; coding: A; Contacts: 5

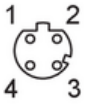


CAN0	
1	n.c.
2	n.c.
3	GND_COM
4	CAN_H
5	CAN_L

CAN1 / RS232	
1	RS232_TxD
2	RS232_RxD
3	GND_COM
4	CAN_H
5	CAN_L

Electrical connection - Ethernet

Connector: 2 x M12; coding: D; Contacts: 4



ETH0 / ETH1	
1	TD+
2	RD+
3	TD-
4	RD-

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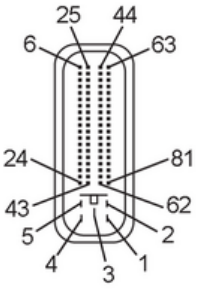
Electrical connection - ST A

Connector: 1 x AMP



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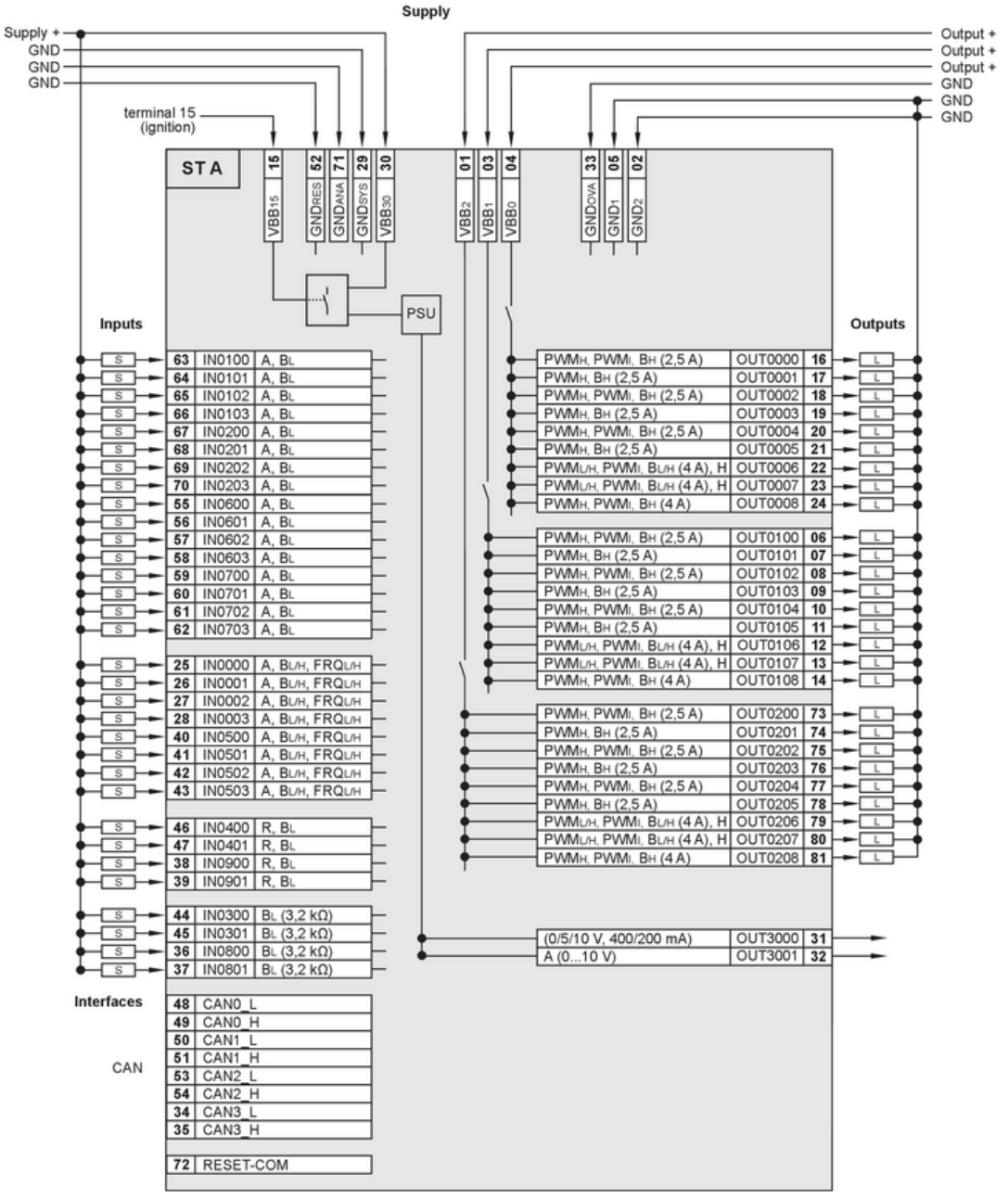
Connection



A	analog
B_L	binary, low-side (CSI)
B_H	binary, high-side (CSO)
B_L/H	binary input, configurable, low-side (CSI) / high-side (CSO)
FRQ_L/H	frequency/pulse input (CSO)
H	H bridge
PSU	power supply for the system
PWM_L/H	pulse width modulation, configurable, low-side (CSI) / high-side (CSO)
PWM-I	pulse width modulation, current-controlled
R	resistor input
VBB0...VBB5	voltage supply, output group
VBB30	voltage supply, controller

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voltage supply	
15	VBB15
30	VBB30
4	VBB0
3	VBB1
1	VBB2
29	GND_SYS
71	GND_ANA
52	GND_RES
33	GND_OVA
5	GND1
2	GND2

multifunction inputs, analog / digital (IN MULTIFUNCTION-A)	
63	IN0100 IN MULTIFUNCTION-A
64	IN0101 IN MULTIFUNCTION-A
65	IN0102 IN MULTIFUNCTION-A
66	IN0103 IN MULTIFUNCTION-A
67	IN0200 IN MULTIFUNCTION-A
68	IN0201 IN MULTIFUNCTION-A
69	IN0202 IN MULTIFUNCTION-A
70	IN0203 IN MULTIFUNCTION-A
55	IN0600 IN MULTIFUNCTION-A
56	IN0601 IN MULTIFUNCTION-A
57	IN0602 IN MULTIFUNCTION-A
58	IN0603 IN MULTIFUNCTION-A
59	IN0700 IN MULTIFUNCTION-A
60	IN0701 IN MULTIFUNCTION-A
61	IN0702 IN MULTIFUNCTION-A
62	IN0703 IN MULTIFUNCTION-A

digital inputs, frequency signal (IN FREQUENCY-B)	
25	IN0000 IN FREQUENCY-B
26	IN0001 IN FREQUENCY-B
27	IN0002 IN FREQUENCY-B
28	IN0003 IN FREQUENCY-B
40	IN0500 IN FREQUENCY-B
41	IN0501 IN FREQUENCY-B
42	IN0502 IN FREQUENCY-B
43	IN0503 IN FREQUENCY-B

digital / resistor inputs (IN RESISTOR-A)	
46	IN0400 IN RESISTOR-A
47	IN0401 IN RESISTOR-A
38	IN0900 IN RESISTOR-A
39	IN0901 IN RESISTOR-A

digital inputs (IN DIGITAL-B)	
44	IN0300 / IN DIGITAL-B
45	IN0301 / IN DIGITAL-B
36	IN0800 / IN DIGITAL-B
37	IN0801 / IN DIGITAL-B

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Interfaces	
48	CAN0_L / CAN0
49	CAN0_H / CAN0
50	CAN1_L / CAN1
51	CAN1_H / CAN1
53	CAN2_L / CAN2
54	CAN2_H / CAN2
34	CAN3_L / CAN3
35	CAN3_H / CAN3
72	RESET-COM / RESET-COM

Outputs, group: VBB0	
16	OUT0000 / OUT PWM-25-A
17	OUT0001 / OUT PWM-25-B
18	OUT0002 / OUT PWM-25-A
19	OUT0003 / OUT PWM-25-B
20	OUT0004 / OUT PWM-25-A
21	OUT0005 / OUT PWM-25-B
22	OUT0006 / OUT PWM-40-BRIDGE-A
23	OUT0007 / OUT PWM-40-BRIDGE-A
24	OUT0008 / OUT PWM-40-A

Outputs, group: VBB1	
6	OUT0100 OUT PWM-25-A
7	OUT0101 OUT PWM-25-B
8	OUT0102 OUT PWM-25-A
9	OUT0103 OUT PWM-25-B
10	OUT0104 OUT PWM-25-A
11	OUT0105 OUT PWM-25-B
12	OUT0106 OUT PWM-40-BRIDGE-A
13	OUT0107 OUT PWM-40-BRIDGE-A
14	OUT0108 OUT PWM-40-A

Outputs, group: VBB2	
73	OUT0200 OUT PWM-25-A
74	OUT0201 OUT PWM-25-B
75	OUT0202 OUT PWM-25-A
76	OUT0203 OUT PWM-25-B
77	OUT0204 OUT PWM-25-A
78	OUT0205 OUT PWM-25-B
79	OUT0206 OUT PWM-40-BRIDGE-A
80	OUT0207 OUT PWM-40-BRIDGE-A
81	OUT0208 OUT PWM-40-A

Sensor supply	
31	OUT0300 OUT SUPPLY-A

analog output	
32	OUT0301 OUT VOLTAGE-A

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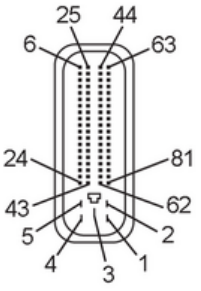
Electrical connection - ST B

Connector: 1 x AMP



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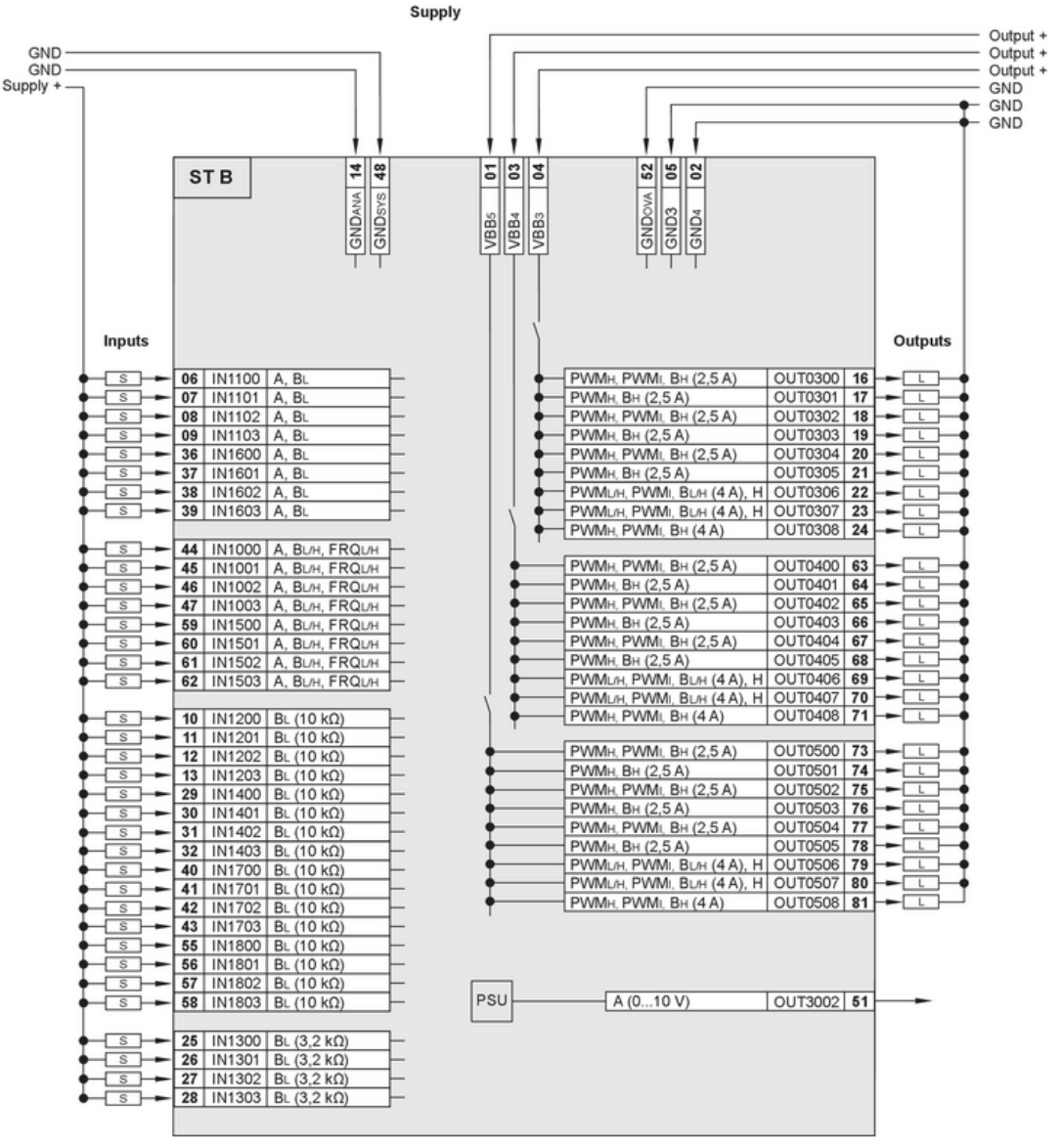
Connection



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B_L/H	binary input, configurable, low-side (CSI) / high-side (CSO)
FRQ_L/H	frequency/pulse input (CSO)
H	H bridge
PSU	power supply for the system
PWM_L/H	pulse width modulation, configurable, low-side (CSI) / high-side (CSO)
PWM-I	pulse width modulation, current-controlled
R	resistor input
VBB0...VBB5	voltage supply, output group
VBB30	voltage supply, controller

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voltage supply	
4	VBB3
3	VBB4
1	VBB5
48	GND_SYS
14	GND_ANA
52	GND_OVA
5	GND3
2	GND4

multifunction inputs, analog / digital (IN MULTIFUNCTION-A)	
6	IN1100 IN MULTIFUNCTION-A
7	IN1101 IN MULTIFUNCTION-A
8	IN1102 IN MULTIFUNCTION-A
9	IN1103 IN MULTIFUNCTION-A
36	IN1600 IN MULTIFUNCTION-A
37	IN1601 IN MULTIFUNCTION-A
38	IN1602 IN MULTIFUNCTION-A
39	IN1603 IN MULTIFUNCTION-A

digital inputs, frequency signal (IN FREQUENCY-B)	
44	IN1000 IN FREQUENCY-B
45	IN1001 IN FREQUENCY-B
46	IN1002 IN FREQUENCY-B
47	IN1003 IN FREQUENCY-B
59	IN1500 IN FREQUENCY-B
60	IN1501 IN FREQUENCY-B
61	IN1502 IN FREQUENCY-B
62	IN1503 IN FREQUENCY-B

digital inputs (IN DIGITAL-A)	
10	IN1200 IN DIGITAL-A
11	IN1201 IN DIGITAL-A
12	IN1202 IN DIGITAL-A
13	IN1203 IN DIGITAL-A
29	IN1400 IN DIGITAL-A
30	IN1401 IN DIGITAL-A
31	IN1402 IN DIGITAL-A
32	IN1403 IN DIGITAL-A
40	IN1700 IN DIGITAL-A
41	IN1701 IN DIGITAL-A
42	IN1702 IN DIGITAL-A
43	IN1703 IN DIGITAL-A
55	IN1800 IN DIGITAL-A
56	IN1801 IN DIGITAL-A
57	IN1802 IN DIGITAL-A
58	IN1803 IN DIGITAL-A

digital inputs (IN DIGITAL-B)	
25	IN1300 IN DIGITAL-B
26	IN1301 IN DIGITAL-B
27	IN1302 IN DIGITAL-B
28	IN1303 IN DIGITAL-B

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Outputs, group: VBB3	
16	OUT0300 OUT PWM-25-A
17	OUT0301 OUT PWM-25-B
18	OUT0302 OUT PWM-25-A
19	OUT0303 OUT PWM-25-B
20	OUT0304 OUT PWM-25-A
21	OUT0305 OUT PWM-25-B
22	OUT0306 OUT PWM-40-BRIDGE-A
23	OUT0307 OUT PWM-40-BRIDGE-A
24	OUT0308 OUT PWM-40-A

Outputs, group: VBB4	
63	OUT0400 OUT PWM-25-A
64	OUT0401 OUT PWM-25-B
65	OUT0402 OUT PWM-25-A
66	OUT0403 OUT PWM-25-B
67	OUT0404 OUT PWM-25-A
68	OUT0405 OUT PWM-25-B
69	OUT0406 OUT PWM-40-BRIDGE-A
70	OUT0407 OUT PWM-40-BRIDGE-A
71	OUT0408 OUT PWM-40-A

Outputs, group: VBB5	
73	OUT0500 OUT PWM-25-A
74	OUT0501 OUT PWM-25-B
75	OUT0502 OUT PWM-25-A
76	OUT0503 OUT PWM-25-B
77	OUT0504 OUT PWM-25-A
78	OUT0505 OUT PWM-25-B
79	OUT0506 OUT PWM-40-BRIDGE-A
80	OUT0507 OUT PWM-40-BRIDGE-A
81	OUT0508 OUT PWM-40-A

analog output	
51	OUT0302 OUT VOLTAGE-A