

# BCX.4cs-ag

BCX body control units

## KEY FEATURES

- High current outputs
- Control specially designed for use in harsh mobile applications
- Flexible programming in C or IEC61131-3 (logi.CAD)

## TECHNICAL DATA

- Aurix TC367 Multicore 32 bit, 300 MHz
- Internal: 576 kB RAM, 4 MB Flash
- External: 32 kB EEPROM
- 1 CAN interface, ISOBUS ISO 11783-31
- 12 inputs SENT, NAMUR
- 20 outputs, 8 half bridges up to 10 A, 4 high side switches with up to 15 A,
- 1 U<sub>ext</sub> display 2A
- 1 sensor supply

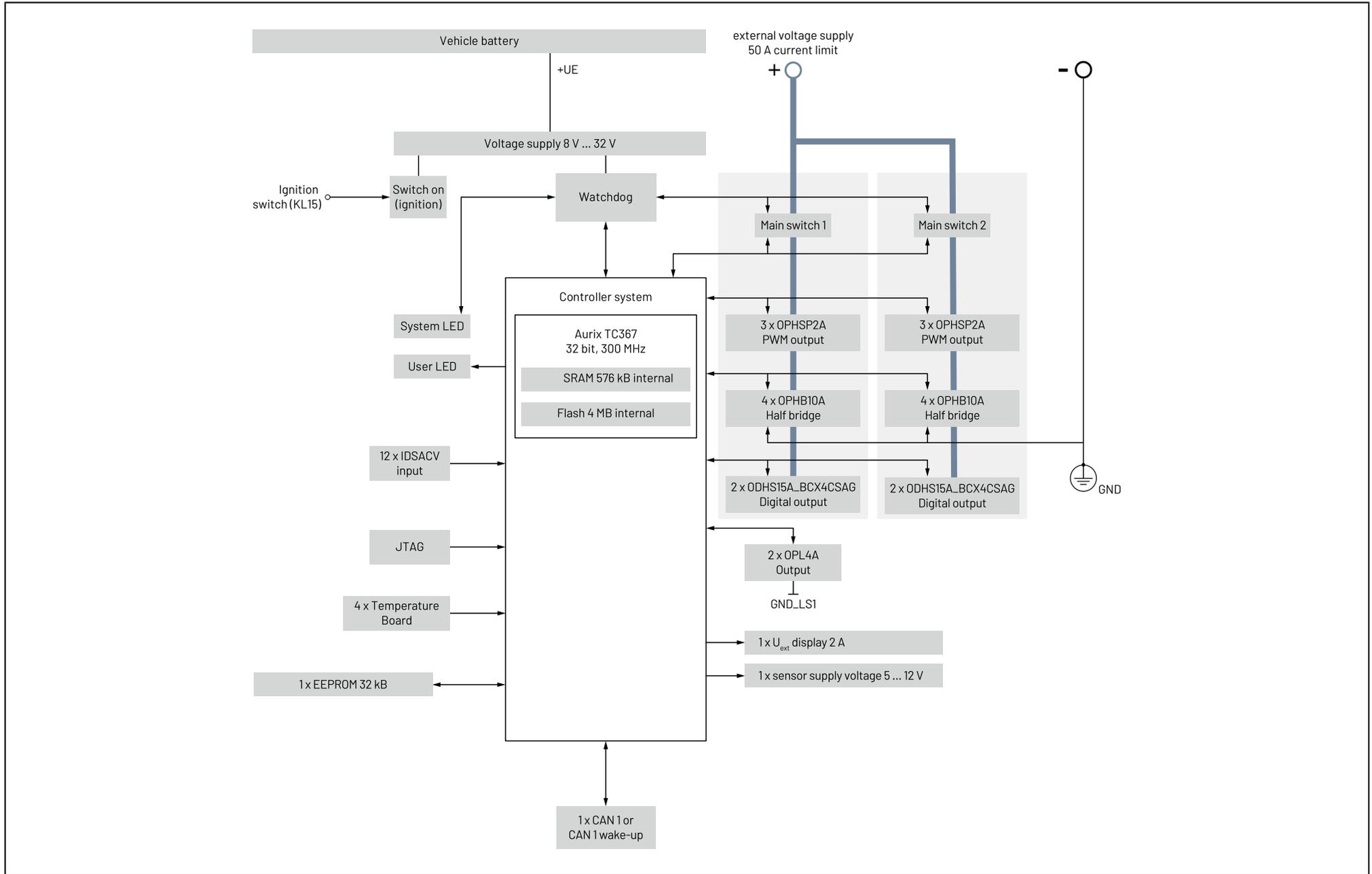
## ACCESSORIES

- Debugger
- Compiler for C and logi.CAD 3 IEC61131-3
- Component deployment C and IEC61131-3 (logi.CAD 3)
- Mating plug
- Integrated into STW's openSYDE software platform

### Sensor-Technik Wiedemann GmbH

Am Bärenwald 6  
87600 Kaufbeuren  
Germany  
+49 8341 9505-0  
info.stw@wiedemann-group.com  
www.stw-mm.com

# BLOCK DIAGRAM



## TECHNICAL DATA

### Processor and memory

Type	Properties	Features
Aurix TC367	32 bit, multicore processor, @ 300 MHz	<ul style="list-style-type: none"> <li>External system supervisor with programmable watchdog</li> <li>12 bit A/D converter for analog signal processing</li> </ul>
Flash	4 MB	Memory allocation between Application Core and Safety Core: <ul style="list-style-type: none"> <li>Application Core: 1632 KiB</li> <li>Safety Core: 2048 KiB</li> </ul>
SRAM	576 kB	On-chip SRAM This memory mainly serves as system memory for BIOS stack and data, but also includes a heap for the customer application.

### Communication interfaces

Type	Maximal available counts	Configuration
CAN	1	CAN 2.0B, baud rate from 100 kbit/s to 1 Mbit/s

# TECHNICAL DATA

## Inputs

Type	Maximum quantity	Possible configuration	Measurement
Digital analog input IDSACV	12	Analog voltage programmable	0 ... 35 V 0 ... 12 V 0 ... 5 V
		Analog current	0 ... 24 mA
		Programmable pull-up resistor	1.1 kΩ to +8.5 V 10 kΩ to +5 V
		Programmable pull-down resistor	1 kΩ to GND
		NAMUR sensor	NAMUR sensor compatible
		Digital (voltage mode)	Active high Active low
		Frequency	0.6 Hz ... 20 kHz
		Incremental encoder interface	Change of position or angular change
		SENT	Full SENT interface at voltage measuring range 0 ... 5 V

## Outputs

Type	Maximum quantity	Possible configuration	Range	Characteristics	Feature
Digital/PWM high side output OPHSP2A	6	PWM	0 ... 2.5 A	0 ... 100 % duty cycle resolution < 0.1 % PWM frequency 20 ... 1000 Hz	<ul style="list-style-type: none"> <li>high side switch</li> <li>precise current measurement, accuracy is <math>\pm 2.3\%</math> (gain) <math>\pm 35</math> mA (offset)</li> <li>supports current control mode</li> <li>digital feedback, open load detection in OFF state</li> <li>automated shutdown on overcurrent 4.6 A <math>\pm 0.9</math> A</li> <li>combine several outputs for parallel operation</li> </ul>
		Digital	-	ON/OFF	

## TECHNICAL DATA

### Outputs

Type	Maximum quantity	Possible configuration	Range	Characteristics	Feature
Digital output ODHS15A_BCX4CSAG	4	Digital	0 ... 15 A	ON/OFF	<ul style="list-style-type: none"> <li>high side switch</li> <li>digital feedback, open load detection in OFF state</li> <li>automated shutdown on overcurrent 20.5 A (-4.5 A, +7 A)</li> <li>precise current measurement, accuracy is <math>\pm 2.3\%</math> (gain) <math>\pm 35</math> mA (offset)</li> </ul>
Digital/PWM low side output OPL4A	2	PWM	0 ... 4 A	0 ... 100 % duty cycle resolution < 0.1 % PWM frequency 20 ... 1000 Hz	<ul style="list-style-type: none"> <li>low side switch</li> <li>precise current measurement, accuracy is <math>\pm 2.3\%</math> <math>\pm 120</math> mA</li> <li>supports current control mode</li> </ul>
		Digital	-	ON/OFF	<ul style="list-style-type: none"> <li>digital feedback, open load detection in OFF state</li> <li>automated shutdown on overcurrent &gt; 7.5 A <math>\pm 0.9</math> A</li> <li>output voltage feedback, accuracy is <math>\pm 4.5\%</math> <math>\pm 200</math> mV</li> </ul>
Digital/PWM half bridge output OPHB10A	8	PWM	0 ... 10 A	0 ... 100 % duty cycle resolution < 0.1 % PWM frequency 5 ... 20000 Hz	<ul style="list-style-type: none"> <li>push-pull output</li> <li>current measurement <math>\pm 2.3\%</math> <math>\pm 400</math> mA</li> <li>supports current control mode</li> <li>digital feedback</li> <li>output voltage feedback, accuracy is 3 % <math>\pm 150</math> mV</li> <li>automated shutdown on overcurrent &gt; 32 A <math>\pm 15</math> A</li> <li>automated shutdown on overtemperature</li> <li>two half-bridge outputs might be combined as full-bridge</li> </ul>
U <sub>ext</sub> display supply (Digital Output OUT_UE_2A)	1	-	-	ON/OFF	<ul style="list-style-type: none"> <li>Maximal output current 2 A</li> <li>Accuracy voltage output is +2 ... -2.5 %</li> <li>Accuracy voltage feedback is <math>\pm 3\%</math> (gain) <math>\pm 0.15</math> V (offset)</li> </ul>

## TECHNICAL DATA

### Outputs

Type	Maximum quantity	Possible configuration	Range	Characteristics	Feature
Sensor supply voltage 5 ... 12 V	1	Voltage	5 ... 12 V	Accuracy voltage output is $\pm 0.9\% \pm 50\text{ mV}$ This is valid under the following conditions: • Capacitive load $\leq 470\ \mu\text{F}$ • Settling time 100 ms Accuracy voltage feedback: $\pm 0.9\% \pm 50\text{ mV}$	Maximal output current $I_{\text{MAX}} = 250\text{ mA}$ programmable output needs derating for output voltages $U_{\text{EXT}} < 10\text{ V}$ : $I_{\text{MAX}} = 0.875 / (13.5 - U_{\text{EXT}})\text{ A}$

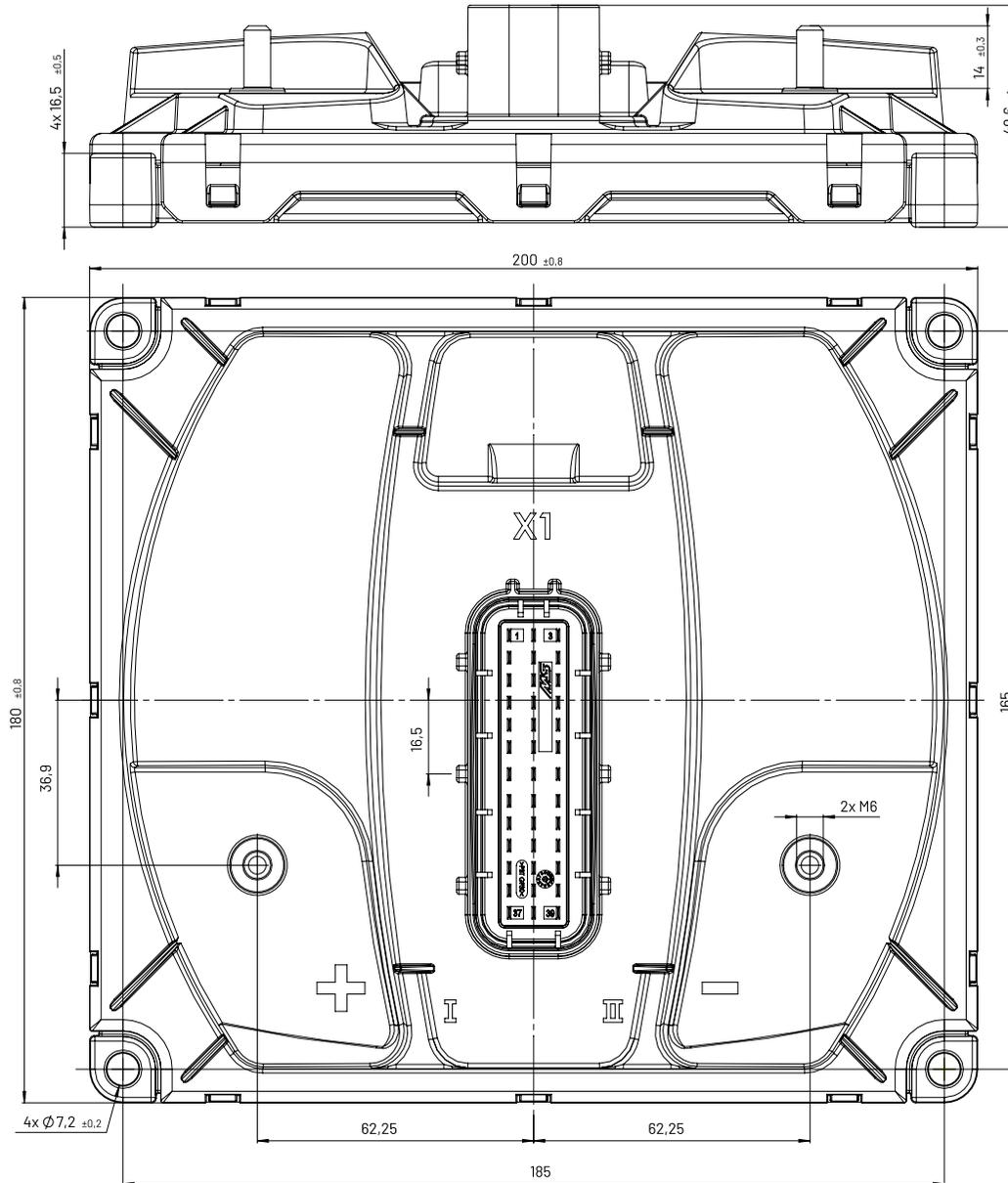
### Mechanical data

Component	Description	Value
Connectors	—	1 x TE-LEAVYSEAL 39 pin
Indicators	2 LED, dual color (red/green or mixed colors)	System LED and User LED
Housing	Die-cast aluminum plate with plastic cover	-
Degree of Protection	—	IP69K
Dimensions	—	200 mm 180 mm x 50 mm
Operating temperature, housing temperature	—	-40 ... +85 °C (-40 ... +185 °F)

# TECHNICAL DATA

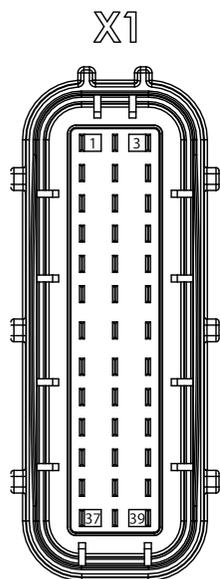
## Power supply

Component	Description	Range	
		Minimum Value	Maximum Value
DC voltage supply	Voltage at +UE ECU supply and +UB power supply	8 V DC	32 V DC
Current consumption	External power supply	-	50 A
	2 x low side output OPL4A	-	8 A, fully loaded
Standby	Sum of input currents at +UE and +UB ( $U_{KL15} = 0$ V, ignition off) Without external load		< 100 $\mu$ A
ECU active	+UE supply current ( $U_{KL15} > U_{KL15HIGH}$ , no external load)		$\approx$ 500 mA at +UE = 12 V $\approx$ 300 mA at +UE = 28 V



# PIN ASSIGNMENT

## Pin assignment main connector X1



Variant 1	Pin	Type	Current	Pin	Type	Current	Pin	Type	Current
	1	CAN bus 1 high		2	Uext_5-12V	0.25 A	3	KL15	
	4	CAN bus 1 low		5	IDSACV_1		6	AGND	
	7	ODHS15A_BCX4CSAG_1	15 A	8	IDSACV_2		9	ODHS15A_BCX4CSAG_3	15 A
	10	U <sub>ext</sub> display 12 V, 2 A	2 A	11	IDSACV_3		12	OPHSP2A_4	2.5 A
	13	ODHS15A_BCX4CSAG_2	15 A	14	IDSACV_4		15	ODHS15A_BCX4CSAG_4	15 A
	16	UE	-	17	IDSACV_5		18	OPHSP2A_5	2.5 A
	19	OPHB10A_1	10 A	20	IDSACV_6		21	OPHB10A_5	10 A
	22	OPHSP2A_3	2.5 A	23	IDSACV_7		24	OPHSP2A_6	2.5 A
	25	OPHB10A_2	10 A	26	IDSACV_8		27	OPHB10A_6	10 A
	28	OPHSP2A_2	2.5 A	29	IDSACV_9		30	OPL4A_2	4 A
	31	OPHB10A_3	10 A	32	IDSACV_10		33	OPHB10A_7	10 A
	34	OPHSP2A_1	2.5 A	35	IDSACV_11		36	OPL4A_1	4 A
	37	OPHB10A_4	10 A	38	IDSACV_12		39	OPHB10A_8	10 A

# QUALIFICATION

## Compliance Information

Standard	Description	Parameter
ISO/IEC 17050-1 REGULATION (EC) No 765/2008	 Conformity	See declaration of conformity
UK marking	 UK Conformity	See declaration of conformity
KBA (Kraftfahrt-Bundesamt)	 Certification This approved device can be used on any vehicle type with the following restrictions: All vehicle types with a 12 V respectively 24 V - electrical wiring and battery(-) at the body	According UN ECE Regulation No. 10
2011/65/EU 2015/863/EU	RoHS Restriction of Hazardous Substances	
2006/42/EC	Machinery directive	