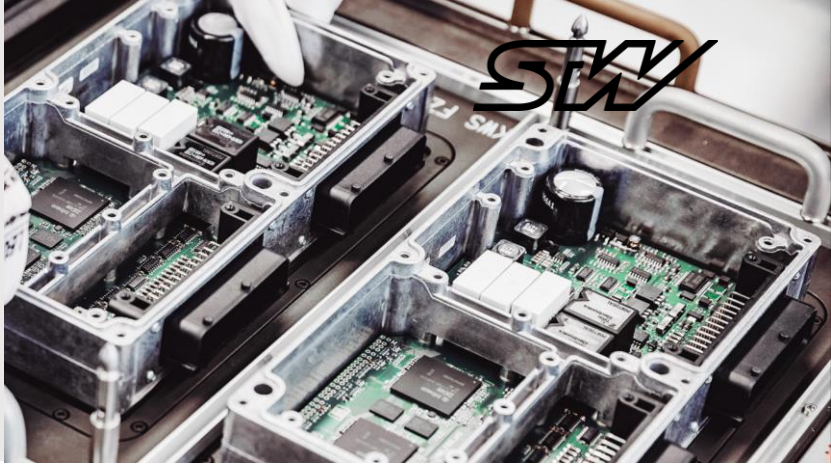
PRELIMINARY DATA SHEET



ESX.4ct

ESX control unit

KEY FEATURES

- Connector- and Pin-compliant to IOXP (and IOX)
- Control specially designed for use in harsh mobile applications
- Flexible programming in C or IEC61131-3 (logi.CAD)
- Suitable for safety-related applications up to PL b

TECHNICAL DATA

- Processor: AURIX TC367 32 bit, 300 MHz
- RAM: 576 kByte internal
- Flash: 4 MByte internal
- User-EEPROM: 32 kByte Data Retention:
  - 25 °C : 100 years / 4 million write cycles
  - 125 °C : 50 years / (1.2 million write cycles at 85 °C)
- Interfaces: 2 x CAN, 1 x RS232/LIN 24 V, optional 3. CAN
- Inputs: 14 / 18 / 22 (12 bit, SENT support)
- Outputs: 13 / 9 / 5
- Options: 6-axis accelerometer & gyroscope, Bluetooth LE v5.1 with internal antenna
- Supply Voltage: 9 ... 32V
- Power Consumption:

Without external load	~100mA
Standby (ignition off)	~1.5mA
Maximum load current	~11A

- Temperature –40°C...+85°C (–40°F...+185°F) Chassis Temperature
- Housing Plastic case - 174mm x 117mm x 36mm IP65 and IP69k

ACCESSORIES

- Deployment: Hightec Compiler for C, logi.CAD IEC61131-3
- Debugger: Lauterbach Aurix-Multicore Debugger
- ESX-Testbox Adapter: STW Cude
- Starter kit: Briefcase with Debug ECU, Break out pcb board, PC-Adapter PCAN-USB and cables
- Mating Plug: part number 10325 (same as required for IOXP)
- Software Toolchain: Integrated in STW **openSYDE**

Preliminary

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87600 Kaufbeuren
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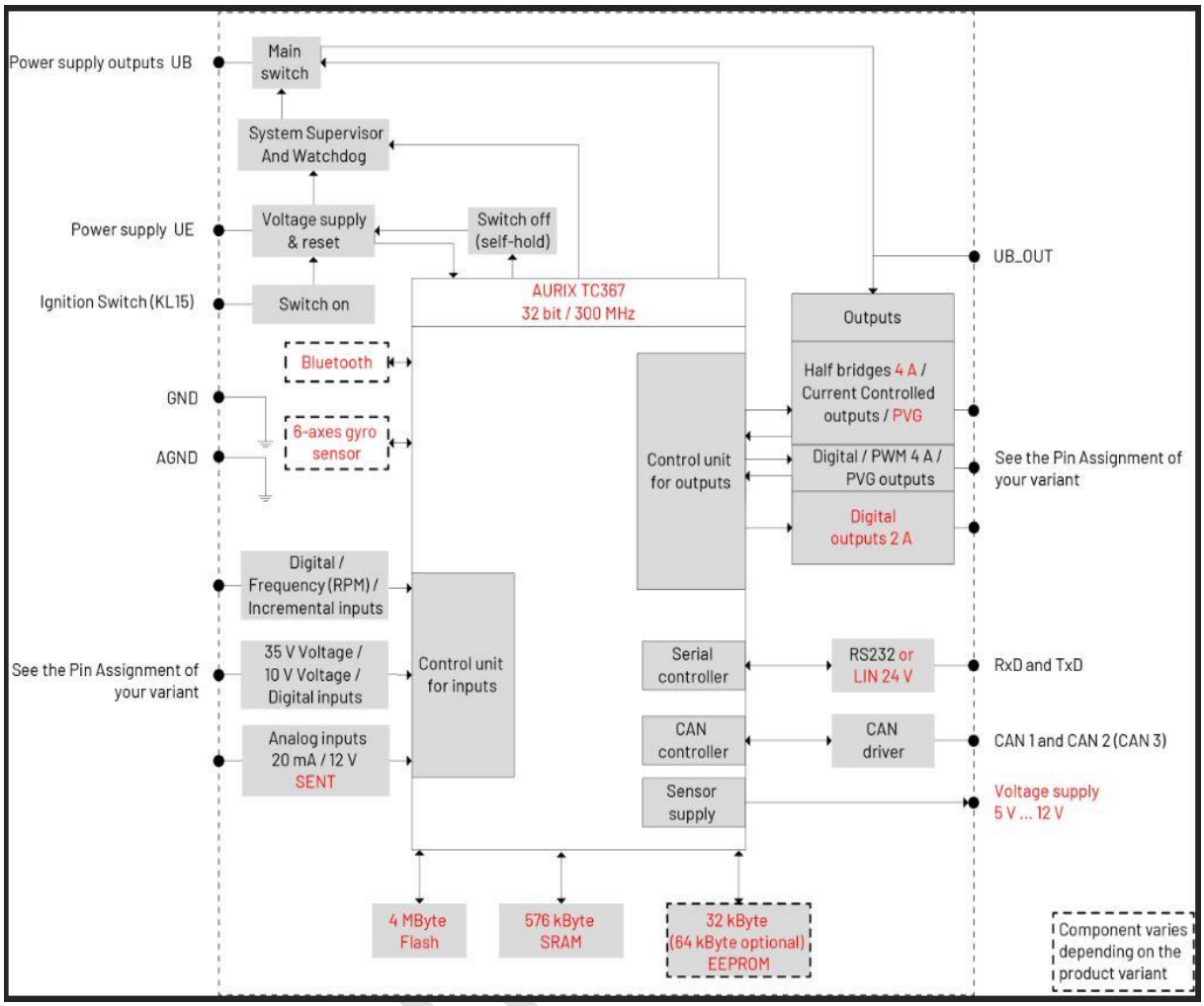
BLOCK DIAGRAM



TECHNICAL DATA

Communication Interfaces

Type	Max. Quantity	Configuration
CAN	2 (3)	CAN 2.0B high-speed and low-speed, baud rate from 100 kbit/s to 1 Mbit/s, compliant to ISO 11783 ISOBUS CAN 1: optional with wake-up functionality
RS232	1	Baud rate up to 115 kBit/s
LIN 24 V	1	Optional

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Inputs

Type	Max. Quantity	Configuration	Measurement	Options / Dependencies
Analog input IACV	4	Analog voltage	0 ... 12 V	
		Analog current	0 ... 24 mA	
		Digital (voltage mode)	Active high Active low	
Multi functional Input IDSACV	4	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	
		Programmable pull-down resistor	1 kΩ to GND	
		NAMUR sensor	NAMUR sensor compatible	
		Digital (voltage mode)	Active high Achtive low	
		Frequency	0.6 Hz ... 20 kHz	
		SENT	SENT interface IDA5V is not fully compliant with SAE J2716:2016-04	
Multifunctional input IDA35V	6	Analog voltage	0 ... 35 V	
		Programmable pull-up resistor	1.1 kΩ to +8.5 V	
		Programmable pull-down resistor	1.0 kΩ to GND	
		Digital	Active high Active low	
		Frequency	0.6 Hz ... 20 kHz	
Multifunctional input IDTA35V_4CT IDTA35V_4CT only available instead of outputs!	12	Analog voltage	0 ...3 5 V	
		Programmable pull-up resistor	6.8 kΩ to +5 V	
		Digital	Active high Active low	Programmable Threshold
		Frequency	0.6 Hz ... 20 kHz Inc. encoder interface (4 pins)	Programmable Thershold
Multifunctional input IDA5V	2	Analog voltage	0 ... 5 V	
		Pull-up resistor	24 kΩ to +13,5 V	
		Digital	Active high	
			Active low	
		Frequency	0.6 Hz ... 20 kHz	
		Incremental encoder interface	Change of position or angular change	
		SENT	SENT interface IDSACV is not fully compliant with SAE J2716:2016-0	

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Outputs

Type	Max. Quantity	Configuration	Range	Property	Features
Digital-/PWM-/half-bridge output OPHB4A	4	PWM PVG Digital	0...4 A	0 ... 100 % duty cycle resolution < 0.1 % PWM frequency 20 ... 1000 Hz 20% UB ... 80% UB for Danfoss valves ON/OFF	High/low side switch Current control diagnosable
Digital-/PWM-/half-bridge output OPHB4A	4	PWM PVG Digital	0...4 A	0 ... 100 % duty cycle resolution < 0.1 % PWM frequency 20 ... 1000 Hz 20% UB ... 80% UB for Danfoss valves ON/OFF	High/low side switch diagnoseable
Digital high side output ODH2A	4	Digital	0 ... 2 A	On/Off combine 2 outputs for parallel operation (permanent hardware option ODH4A)	High side switch, diagnosable
Digital high side output ODH4A_4CT	1	Digital	0 ... 4 A	On/Off	High side switch UB_OUT (PinN 19)
Sensor supply voltage 5 ... 12 V	1	Voltage	5 ... 12 V	Maximal output current: I_{MAX} = 250 mA programmable output needs derating for output voltages U_{EXT} < 10 V: I_{MAX} = 0.875 / (13.5 - U_{EXT}) A	

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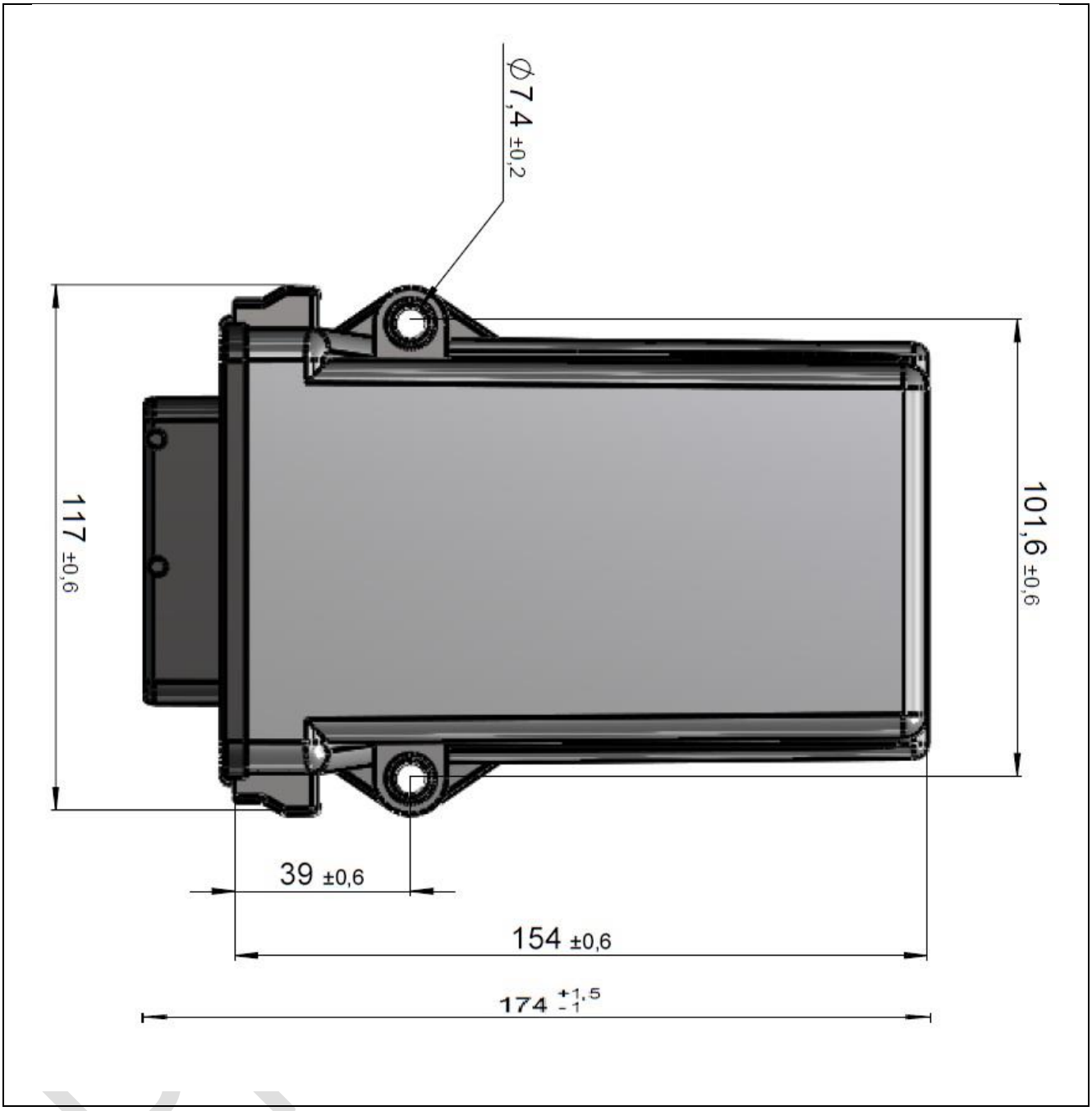
TECHNICAL DRAWING



QUALIFICATION

- Qualified to the applicable standards for automotive, agricultural and construction industries
- E1 – approval from Kraftfahrtbundesamt
- **EQUIVALENT TO IOXP / IOX**

PIN ASSIGNMENT / PIN CONNECTOR

PinN	ESX.4ct	HW Option
1	GND	
2	ODH2A / IDTA35V_4CT	IDTA35V_4CT
3	ODH2A / IDTA35V_4CT	ODH4A / IDTA35V_4CT
4	ODH2A / IDTA35V_4CT	IDTA35V_4CT
5	ODH2A / IDTA35V_4CT	ODH4A / IDTA35V_4CT
6	OPHB4A / IDTA35V_4CT	
7	OPHB4A / IDTA35V_4CT	
8	OPHB4A / IDTA35V_4CT	
9	OPHB4A / IDTA35V_4CT	
10	OPHB4A no CM / IDTA35V_4CT	
11	OPHB4A no CM / IDTA35V_4CT	
12	OPHB4A no CM / IDTA35V_4CT	
13	OPHB4A no CM / IDTA35V_4CT	
14	UB	
15	AGND	
16	D+	
17	CAN1_L	
18	RS232 TxD / LIN 24 V	IDA5V
19	UB_OUT	
20	IDA35V	
21	IDA35V	
22	IDA35V	CAN3_H
23	CAN2_H	
24	IACV	
25	IACV	
26	IDSACV	
27	IDSACV	
28	UB	
29	GND	
30	UE	
31	CAN1_H	
32	Uext 5-12V / 100-250 mA	
33	RS232 RxD	IDA5V
34	IDA35V	
35	IDA35V	
36	IDA35V	CAN3_L
37	CAN2_L	
38	IACV	
39	IACV	
40	IDSACV	
41	IDSACV	
42	UB	

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