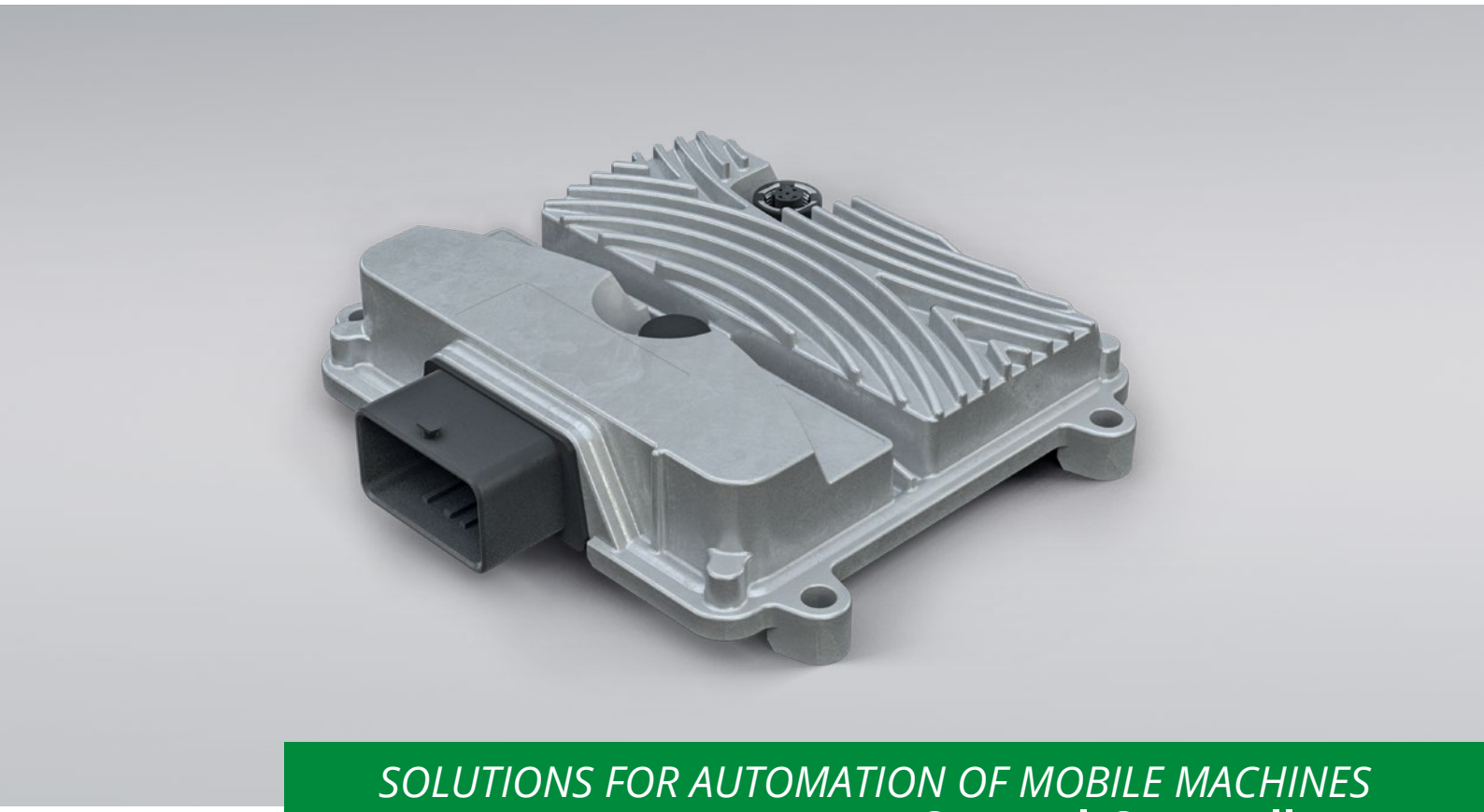
Automation, Connectivity and
Electrification of Mobile Machines

- preliminary -



SOLUTIONS FOR AUTOMATION OF MOBILE MACHINES

Central Controllers

TECHNICAL DATA ESX-3CS

www.sensor-technik.com

ESX-3CS - Electronic Control Unit

New compact controller
The ESX-3CS is designed for use in small mobile working machines.

Switch to 32 Bit
The ESX-3CS is the new member of the 32-bit controller family of STW. It allows the almost cost neutral switch from the 16-bit-ESX-2 controller to the modern and more powerful 32-bit architecture with TriCore processors.

TECHNOLOGY	BENEFITS
► Safety	► The ESX-3CS is designed for safety-oriented applications
► High Switching Capacity	► Current outputs per group up to 12 A Parallel circuit of several outputs with up to 12 Ampere possible
► Freely Programmable	► Programming with IEC61131-3 or "C", Matlab integration available
► Communication Interfaces	► Multiple communication capabilities: 2 CAN interfaces, one with wake-up functionality, RS232 and optional LIN and Ethernet interface
► Starter-Kit	► All necessary components for fast commissioning and programming in one case: ESX-3CS, break-out box, connecting cables, documentation
► Robust Construction	► Compliance with the standards for conformity with CE, E1, and RoHS. Qualified to the applicable standards for automotive, agricultural and construction industries. Operating temperature range: −40 °C to +85 °C (−40 °F to +185 °F).

Technical Data

Processor and memory		
Type	Properties	Features
TriCore TC 1798	32 bit, Multicore	@ 300 MHz
SRAM	288 kB internal	
SDRAM	8 MB external	Available space for customer application (non-safety): in C: 7.80 MB in CODESYS: 3.00 MB
Flash	4 MB internal	Available space for customer application (non-safety): in C: 3.75 MB in CODESYS: 2.00 MB
EEPROM	32 kB	Available space for customer application (non-safety): in C: 24 kB in CODESYS: 24 kB

Communication Interfaces		
Type	Max. Quantity	Configuration
CAN	2	CAN 2.0 B, Low-/High-Speed max. 1 Mbit/s
		CAN 1: Wake-up functionality
Opt. RS 232	1	baud rate up to 115 kbit/s
Opt. LIN	1	LIN 2.2A
Opt. Ethernet	1	ETH1: Speed up to 100 Mbit/s, only for diagnosis

Inputs				
Type	Max. Quantity	Configuration	Measurement	Options / Dependencies
Analog Input IACV	4	Voltage	0 … 12 V	
		Current	4 … 20 mA	
		Digital	Voltage	Cutoff frequency: 100 Hz
		Edge Evaluation	Events, rising/falling edges	
Multi Function Input IDA5V	8	Analog Voltage	0 … 5 V	e.g. PT1000, KTY
		Digital	Low-Active	Programmable pull-up resistor 1 kOhm to 5 V
			High-Active	External pull-down resistor required
		Frequency	0.6 Hz … 20 kHz	
		Edge Evaluation	Events, rising/falling edges	
		SENT Interface		
Multi Function Input IDA35V	4	Analog Voltage	0 … 35 V	
		NAMUR Sensors		
		Digital	Low-Active	Programmable pull-up (1 kOhm to 8.5 V) or pull-down resistors
			High-Active	
		Frequency	0.6 Hz … 20 kHz	A maximum of 8 Inputs can be used for the function "Average Frequency Measurement"
		Edge Evaluation	Events, rising/falling edges	
		Incremental Input	Position or angle change	Pairs of 2 inputs can be connected to a maximum of 4 incremental encoder inputs
Ident Input IMID	2	Identifier Input	8 Conditions	

Outputs All outputs are short circuit protected					
Type	Max. Quantity	Configuration	Range	Property	Features
Digital-/PWM-Output OP2A	8	Digital	0 … 2.5 A	Current On/Off	High side switch Current control with 2 % accuracy Digital feedback Cut-off at overcurrent (>4.6 A ±20 %) Several outputs in parallel circuit for up to 12 A
		PWM		0 … 100 % max. 500 Hz	
Digital-/PWM-Output OD2A	4	Digital	0 … 2.5 A	Current On/Off	High side switch Voltage measurement with ±3 % accuracy Current detection
		PWM		0 … 10 % max. 500 Hz	
Digital-/PWM-Output OPL4A	2	Digital	0 … 4 A	Current On/Off	Low side switch Current control with 3 % accuracy Voltage measurement with ±3.5 % accuracy Cut-off at overcurrent (> 7.5 A ±20 %)
		PWM		0 … 100 % max. 500 Hz	
Analog Output OAV10V	1	Analog	0 … 10 V	Voltage On/Off	Load impedance max. 500 Ohm Resolution 10 mV
Sensor Supply UExt	2	Programmable	5 … 12 V	100 … 250 mA	
		Fixed Voltage	5 V	250 mA	

System Data		
Type	Property	Values
Supply Voltage	Direct Current (DC)	8 … 32 V
Power Consumption	Without external load	
	Standby (ignition off)	< 1 mA
	Maximum load current	
Temperature	Chassis Temperature	–40 °C … +85 °C –40 °F … +185 °F
Connector	Molex CMC	

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