

# TTC 2030

# FAMILY

## Powerful Safety Electronic Control Units

The TTC 2030 is a family of compact control units specially developed for use in cost-sensitive applications or smaller vehicles.

The controllers are designed for use in demanding safety-relevant applications.

The product variant TTC 2038 fulfills safety requirements up to SIL 2 (IEC 61508), PL d (EN ISO 13849), AgPL d (ISO 25119), ASIL C (ISO 26262) and MPL d (ISO 19014) and is TÜV safety certified.

## KEY BENEFITS

- Future-proof high-performance 2nd generation Infineon AURIX™ TriCore™ with 2 cores (lockstep cores) running at 300 MHz and hardware security module \*
- C-programming API with multicore real-time Operating system
- 2 x CAN FD interfaces, one with ISOBUS capability
- 4 x SENT interfaces with SPC support
- 30 x highly configurable I/Os
- Safety certified



## HIGH-SPEED CONNECTIVITY

In addition to two CAN FD interfaces (bit rate of up to 2 Mbit/s), featuring Wake-Up over CAN and ISOBUS compatibility, the TTC 2030 is equipped with a LIN interface.

## INTEGRATED PXROS REAL-TIME OPERATING SYSTEM WITH MULTICORE SUPPORT

- A high percentage of the run-time tests that are needed to achieve the diagnostic coverage required for SIL 2 / PL d is performed in hardware by the dual-core lockstep CPU and its safety companion.
- This keeps much more processing power available for the application in comparison with solutions that implement the safety measures in software.
- The available memory protection mechanisms allow the execution of safety and non-safety software on the same ECU without interference. The time-consuming validation of non-safety software is therefore no longer necessary. Via CODESYS® safe data communication is achieved by the standardized CANopen® Safety protocol of the control units. In case of a safety-relevant failure, outputs can be shut off in (up to 3) groups allowing limp-home functionality.
- The safety certified CODESYS® Safety SIL 2 with its validated compiler and code generator speeds up application development significantly.

## EXTENDED SOFTWARE FEATURE SET

A file system is provided for efficient memory management, data logging and configuration. The bootloader is compatible with Unified Diagnostic Services (UDS) for standardized vehicle diagnosis and software updates.

In case of an emergency, up to two safety groups of freely assignable output pins can be deactivated via an external switch. This enables easy and cost-efficient implementation of an emergency button\* to the machine.

## ROBUSTNESS

The freely programmable high-end control units with a powerful dual-core ARM Cortex®-R4 lockstep processor are protected by a compact, automotive-style housing suited for harsh environments.

## APPLICATION FIELDS

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- Passenger cars
- Buses
- Trucks
- Small vehicles (e.g. Motorbikes)
- Agricultural/ Construction/ Municipal vehicles

## RICH AND FLEXIBLE I/O SET

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Up to 30 highly configurable I/Os are available, which can be initialized at the application level as different types of inputs or outputs. In addition to analog and digital timer inputs, the ECU is also equipped with HS PWM and PVG outputs. This ensures that the various hydraulic valves used in off-highway machinery can be controlled, making the TTC 2030 the perfect solution for hydraulics control.

Part of the design are multiple current measurement feedback loops and plausibility checks which enable runtime self-diagnosis of the vehicle and various safety architectures. For connection of smart sensors, up to four SENT interfaces (compliant with the SAE J2716 standard) with Short PWM Code (SPC) support are available. They enable cost-efficient transmission of sensor data to the ECU.

## VARIANT OVERVIEW

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	TTC 2038
CPU	Infineon Aurix™ TriCore™ TC367 300 MHz, 3 cores (2 lockstep cores)
	576 KB int. SRAM, 4 MB int. Flash
	128 KB int. EEPROM emulation
	Hardware security module *
INTERFACES	2 x CAN FD up to 2 Mbit/s (1 x CAN ISOBUS compliant; 1 x CAN wake-up capable)
	4 x SENT with SPC support
	1 x LIN serial interface
NUMBER I/OS	16 inputs / 16 outputs
SENSOR SUPPLY	1 x sensor supply 5 V / max. 250mA
INTERNAL	Internal monitoring of board temperature, sensor supply and supply voltage Power-On via Terminal 15, Wake-up pin
SOFTWARE	Programming Environment featuring RTOS support
	CODESYS® V3 including support for CANopen® Master*
	CODESYS® Safety SIL 2 including support for CANopen® Safety Master*
FUNCTIONAL SAFETY	IEC 61508 SIL2 / EN ISO 13849 PL D / ISO 25119 AGPL D SRL2 / ISO 26262 ASIL C / ISO 19014 MPL D

\*UPCOMING FEATURE