High Performance Safety Motor Controller – Volution 144

General description

Volution 144 is a robust and versatile electronic control unit used as an independent power module with H-Bridge function to control electric motors and linear actuators.

Volution 144 is equipped with Infineon's TriCore™ Aurix™ TC377 CPU designed to fulfil the demanding performance requirements of off-highway and automotive safety applications.

Volution 144 is protected by a compact, automotive-style housing suited to mobile and stationary applications in harsh environments.

Specifications

Parameter		Unit
ECU dimensions	185 x 167.5 x 37.75	mm
Dimensions for minimum connector release clearance (excl. cables)	228,3 x 185 x 44	mm
Weight	570	g
Connector	2 x 28	pins
Operating temperature (ambient)	-40 to +85	°C
Mounting interface (conduction cooling interface)	-40 to +85	°C
Operating altitude	0 to 4000	m
Supply voltage	8 to 32	V
Supply current at 12/24V without load	130 / 100	mA_{max}
Standby current	<1	mA_{max}
Total load current	48	A_{max}

Standards		
Functional safety	EN ISO 13849 PL c IEC 61508 SIL2*	
CE-Mark	2014/30/EU 2006/42/EC	
E-Mark	ECE-R10 Rev.6	
FCC-Mark	47 CFR Part 15B, Class A	
EMC	EN 13766 ISO 14982	IEC 61000-4-2/-3/-4/-5/-6/-8 IEC 61000-6-4
ESD	ISO 10605	
Electrical	ISO 16750-2 ISO 7637-2/-3	
Ingress protection	ISO 20653 IP6k7 and IP6k9k	
Environmental	ISO 16750-4	
Mechanical	ISO 16750-3	
ISOBUS	ISO 11783	

Software

- Available with the software platform MATCH® by HYDAC Software
- C-Programming Environment with real-time operating system

* available upon request

Features

CPU Core

- 32-Bit Infineon TriCore™ Aurix™ TC377
- 3 TriCore™ cores (2 lockstep cores) running at 300 MHz and memory protection for safety-relevant applications
- Floating-Point Unit and Hardware Security Module
- 992 KB int. SRAM, 6 MB int. Flash
- 256 KB int. EEPROM emulation

Interfaces

- 2 x CAN FD 50 kbit/s up to 2 Mbit/s (1 x CAN FD with wake-up capability and 1 x CAN FD ISOBUS)
- 2 x CAN bus terminations configurable via connector pins

Outputs

- 2 x H-Bridge for motor control, 10 kHz, up to 16 A, with option to be combined as 1 full x 32 A, low-side current measurement
- 2 x H-Bridge for motor control, 10 kHz, up to 8 A, with option to be combined as 1 full x 16 A, low-side current measurement
- 4 x PWM OUT up to 1 kHz or digital OUT, up to 4 A, high side, with current measurement
  alternative use as digital timer IN (0.1 Hz - 20 kHz)** with configurable pull-up in groups of 2 or
  analog IN 12 bit, 0 - 32 V or LED control OUT
- 1 x emergency stop OUT,
  alternative use as analog IN 12 bit, 0 - 32 V or
  PVG OUT, 10 - 90% of BAT+ or
  voltage OUT 0 - 10 V

Inputs

- 4 x analog IN 12 bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm, LED control
- 4 x digital timer IN (0.1 Hz - 20 kHz), encoder support, configurable pull-up/down, support for 7/14 mA current loop speed-sensors
  alternative use as analog IN 12 bit, 0 - 32 V, 0 - 25 mA
- 2 x analog IN 12 bit, 0 - 32 V
- 2 x emergency stop IN
  alternative use as analog IN 12 bit, 0 - 32 V
- Terminal 15

Sensor supply

- 1 x sensor supply, 5 V, max. 150 mA

All inputs and outputs supporting analog IN can also be used as digital Input. All I/Os and interfaces are protected against short circuit to GND and BAT+ and can be configured by software.

Board temperature, sensor supply, and supply voltage are monitored by software. One independent shut-off group for PWM output stages. Details to the standards can be found in the user manual.

** upcoming feature

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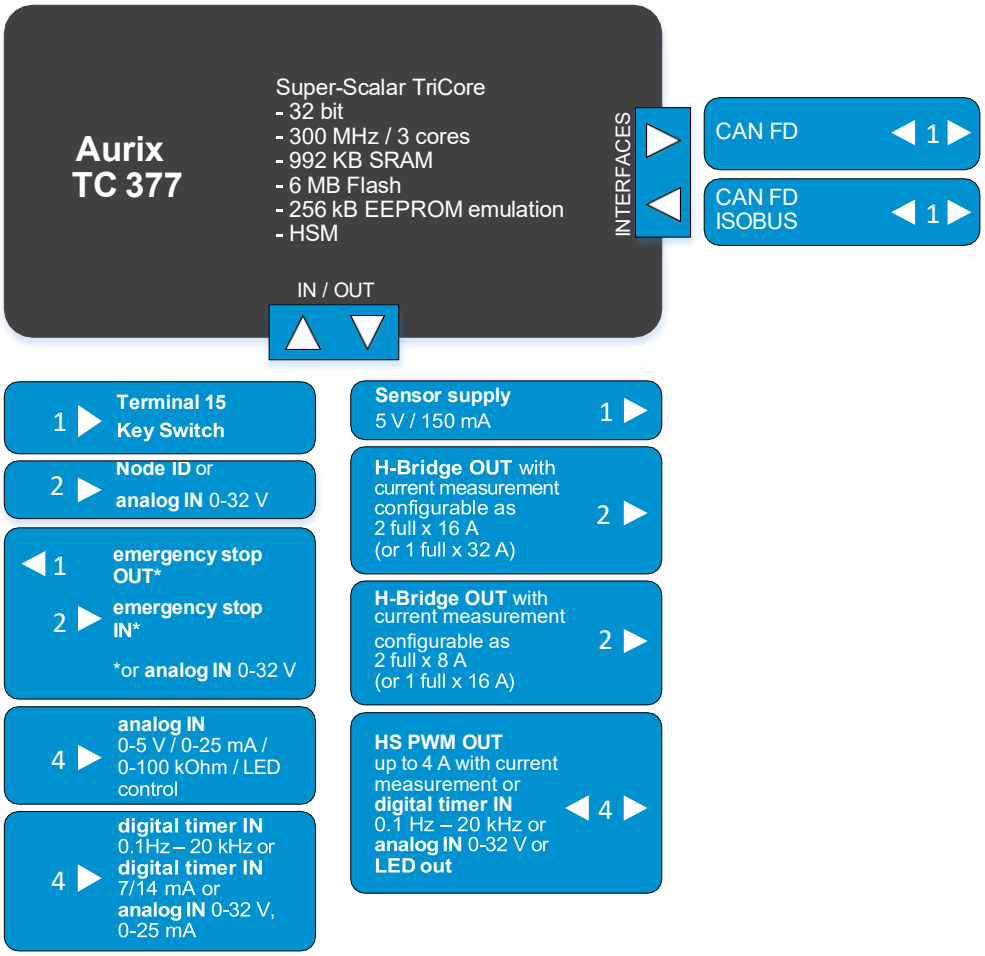
Block diagram

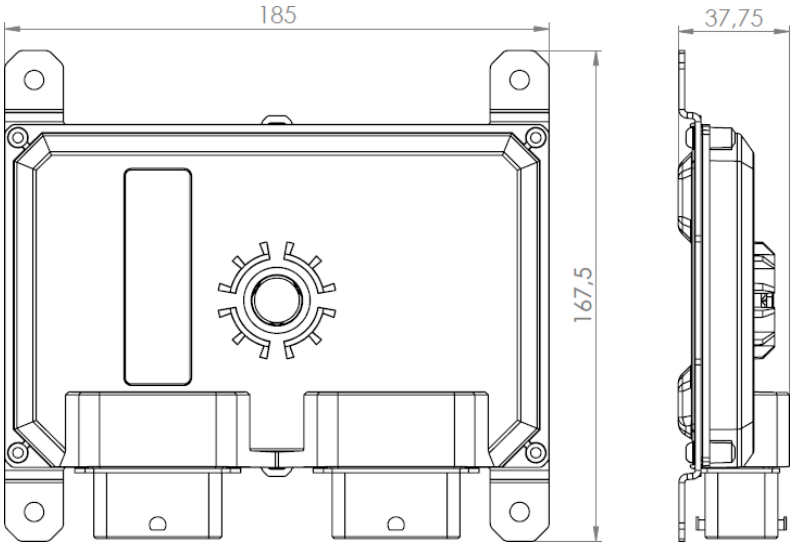


Housing and connector

Top Cover: PBT plastic compound

Bottom Cover: Sheet metal Al-alloy

Connector: 2 x 28-pin connectors



For further information, including price and availability, please contact products@ttcontrol.com