High-end Safety Controller – TTC 2740

General Description

TTC 2740 is a robust and powerful high-end electronic control solution for use in off-highway applications. The TTC 2740 is equipped with Infineon's TriCore™ Aurix™ TC399 CPU designed to fulfil the requirements in demanding safety-relevant construction, agricultural, municipal, material handling and automotive applications.

The TTC 2740 is part of a complete and compatible product family and is protected by a compact, automotive-style housing suited to mobile and stationary applications in harsh environments.

Specifications

Parameter		Unit
ECU Dimensions	220.5 x 315.0 x 41.2	mm
Dimensions for minimum connector release clearance	180x50x50 235x50x50	mm
Weight	2652	g
Connector	4 x 48-pin + 1 x 2-slot HSD	
Operating Temperature	-40 to +85	°C
Operating Altitude	0 to 4000	m
Supply Voltage	8 to 32	V
Maximum Supply Current at 12/24V without load	333 / 166	mA$_{max}$
Maximum Standby Current	<1	mA$_{max}$
Maximum Total Load Current	80	A
Standards		
Functional safety	IEC 61508 SIL2 EN ISO 13849 PL d ISO 25119 AgPL d SRL2 ISO 26262 ASIL C ISO 19014 MPL d	
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 CISPR 25 IEC 61000-4-2/-3/-4/-5/-6/-8	
ESD	ISO 10605 IEC 61000 -6-4	
Electrical	ISO 16750-2 ISO 7637-2, -3	
Ingress Protection	EN 60529 IP65 and IP67 ISO 20653 IP6k9k	
Climatic	ISO 16750-4	
Mechanical	ISO 16750-3	
ISOBUS	ISO 11783	

Software

- C Programming Environment with real-time operating system

Features

CPU Core

- 32-Bit Infineon TriCore™ Aurix™ TC399
- 6 cores (4 lockstep cores) running at 300 MHz and memory protection for safety-relevant applications
- Floating-Point Unit and Hardware Security Module
- 6.47 MB int. SRAM, 16 MB int. Flash
- 32 MB ext. Flash, 1 MB internal EEPROM Emulation

Interfaces

- 8 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)
- 1 x CAN bus termination configurable via connector pins
- 2 x 100BASE-T1 (internal configurable Ethernet switch)
- 4 x SENT with SPC support*, 2 x LIN
- 1 x Real Time Clock (with external supply)

Outputs

- 46 x PWM OUT up to 1 kHz or digital OUT, up to 4 A (6 x up to 8 A), high side, with current measurement alternative use as digital timer IN (0.1 Hz - 20 kHz) configurable pull-up in groups of 2 or analog IN 12 bit, 0 - 32 V with configurable pull-up or LED control OUT*
- 12 x digital OUT up to 4 A, high side, current sense alternative use as PVG OUT, 10 - 90% of BAT+ or 4x as voltage OUT 0 - 10 V or LED control OUT* or analog IN 12 bit, 0-32V or (1x) Emergency stop OUT*
- 12 x digital OUT up to 4 A, low side, current sense or alternative use as analog IN 12 bit 0 - 5V/0 - 32V
- 3 x Status LED

Inputs

- 32 x analog IN 12 bit, 0-5V with configurable pull up/down, 0 - 25 mA, 0 - 100 kOhm, LED control
- 8 x digital timer IN (0.1 Hz - 20 kHz), encoder support, configurable pull-up/down, support for 7/14 mA current loop speed-sensor alternative use as analog IN 12 bit, 0 - 32 V, 0 - 25 mA
- 8 x digital timer IN (0.1 Hz - 20 kHz), encoder support, configurable pull-up alternative use as analog IN 12 bit, 0 - 32 V or (4x) SENT interfaces
- 14 x analog IN 12 bit, 0 - 5 V, 0 - 32 V with configurable pull up/down or (2x) Emergency stop IN*
- Terminal 15 and Wake-Up

Sensor supply

- 4 x sensor supply, 5 V, max. 500 mA
- 1 x sensor supply, 5 - 12 V, max. 2.5 W, configurable by SW in 0.5 V steps
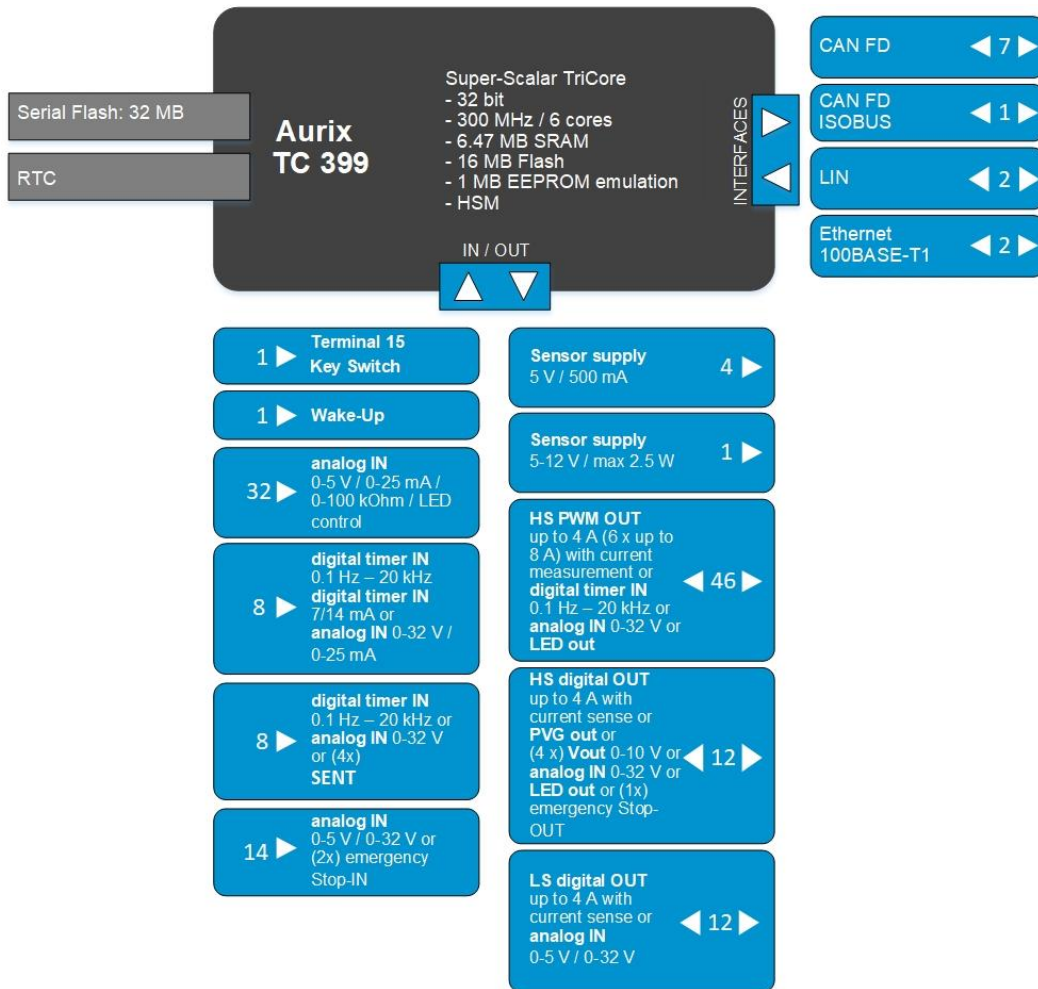
All inputs and outputs supporting analog IN can also be used as digital Input.

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. Three independent shut-off groups for PWM output stages. Details to the standards can be found in the System-Manual.

*upcoming feature

Block Diagram

Serial Flash: 32 MB

RTC

Aurix TC 399

Super-Scalar TriCore
- 32 bit
- 300 MHz / 6 cores
- 6.47 MB SRAM
- 16 MB Flash
- 1 MB EEPROM emulation
- HSM

INTERFACES

IN / OUT

CAN FD	◄ 7 ►
CAN FD ISOBUS	◄ 1 ►
LIN	◄ 2 ►
Ethernet 100BASE-T1	◄ 2 ►

1 ► Terminal 15
Key Switch

1 ► Wake-Up

32 ► analog IN
0-5 V / 0-25 mA /
0-100 kOhm / LED
control

8 ► digital timer IN
0.1 Hz – 20 kHz
digital timer IN
7/14 mA or
analog IN 0-32 V /
0-25 mA

8 ► digital timer IN
0.1 Hz – 20 kHz or
analog IN 0-32 V
or (4x)
SENT

14 ► analog IN
0-5 V / 0-32 V or
(2x) emergency
Stop-IN

Sensor supply
5 V / 500 mA **4 ►**

Sensor supply
5-12 V / max 2.5 W **1 ►**

HS PWM OUT
up to 4 A (6 x up to
8 A) with current
measurement or
digital timer IN
0.1 Hz – 20 kHz or
analog IN 0-32 V or
LED out ◄ 46 ►

HS digital OUT
up to 4 A with
current sense or
PVG out or
(4 x) Vout 0-10 V or
analog IN 0-32 V or
LED out or (1x)
emergency Stop-
OUT ◄ 12 ►

LS digital OUT
up to 4 A with
current sense or
analog IN
0-5 V / 0-32 V ◄ 12 ►

Housing and Connector

Aluminum die-cast housing

Main connectors:

4 x 48-pin connectors

1 x 2-slot HSD connector

220.5

315.0

41.2
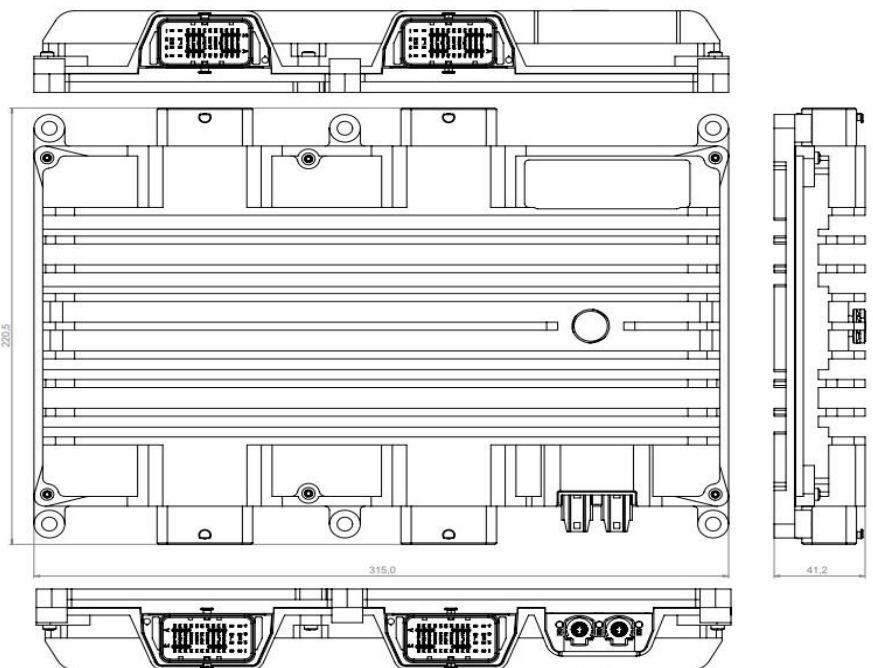
For further information, including price and availability, please contact products@ttcontrol.com