Compact Safety I/O Module – TTC 2038XS

General description

The TTC 2038XS is an I/O slave module which is designed for distributed safety applications that require a high number of PWM outputs in remote locations and cost-sensitive projects. The TTC 2038XS is designed following functional safety standards and is certified by TÜV NORD. It is equipped with Infineon's TriCore™ Aurix™ TC367 CPU and meets the requirements in state-of-the-art safety relevant applications.

The TTC 2038XS is part of a complete and compatible product range for the off-highway and automotive industries. The module is protected by a compact automotive style housings which is perfectly suited for harsh operating conditions.

The TTC 2038XS is controlled using the CANopen® Safety protocol. The module provides a wide range of flexible configurable I/Os and allows local current control using PWM outputs.

Specifications

Parameter		Unit
ECU dimensions	147 x 92 x 38	mm
Dimensions for minimum connector release clearance	208 x 92 x 38	mm
Weight	330	g
Connector	1 x 48	pins
Operating temperature	-40 to +85	°C
Operating altitude	0 to 4000	m
Supply voltage	8 to 32	V
Supply current at 12/24V without load	200/100	mA_{max}
Standby current	≤ 0,8	mA_{max}
Total load current	24	A_{max}
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 IEC 61000-6-4
ESD	ISO 10605	
Electrical	ISO 16750-2 ISO 7637-2, -3, limited to 40 V by external load dump protection	
Ingress protection	EN 60529 IP65 and IP67 ISO 20653 IP6k9k	
Climatic	ISO 16750-4	
Mechanical	ISO 16750-3	
CANopen® Standards	EN50325-5, CiA-401, CiA-305, CiA-301	

Features

CPU Core

- 32-Bit Infineon TriCore™ Aurix™ TC367
- 2 cores (lockstep cores) running at 300 MHz and memory protection for safety-relevant applications
- Floating-Point Unit and Hardware Security Module
- 576 KB int. SRAM, 4 MB int. Flash
- 128 KB int. EEPROM emulation

Interfaces

- 1 x CAN 50 kbit/s up to 1 Mbit/s
- 4 x SENT with SPC support

Outputs

- 8 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) configurable pull-up in groups of 2 or
  analog IN 12 bit, 0 - 32 V with configurable pull-up or
  LED control OUT
- 6 x digital OUT up to 4 A, high side, current sense,
  alternative use as PVG OUT, 10 - 90% of BAT+ or
  voltage OUT 0 V - 75 % BAT+ or
  LED control OUT or
- analog IN 12 bit, 0 - 32 V2 x PWM OUT up to 4 kHz, up to 4 A, low side, current measurement, featuring timer feedback
  alternative use digital timer IN (0.1 Hz - 20 kHz) or
  analog IN 12 bit, 0 - 5 V, 0 - 32 V

Inputs

- 8 x analog IN 12 bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm, LED control
- 2 x Node ID modifier pins
- 2 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
- 4 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
  SENT interface or
  digital IN for switching to GND and BAT+
- 1 x Terminal 15
- 1 x Wake-Up

Sensor supply

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

Software

- CANopen® Safety I/O Module software preinstalled

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.

Board temperature, sensor supply, and supply voltage are monitored by software.

One safety shut-off group for PWM output stages is available.

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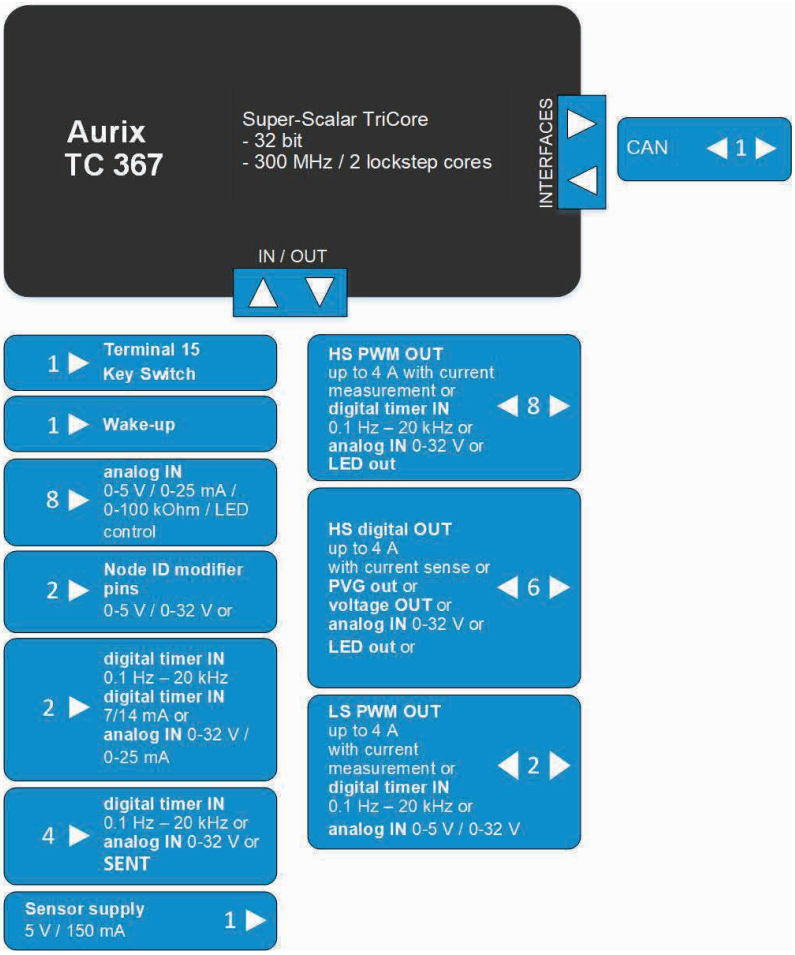
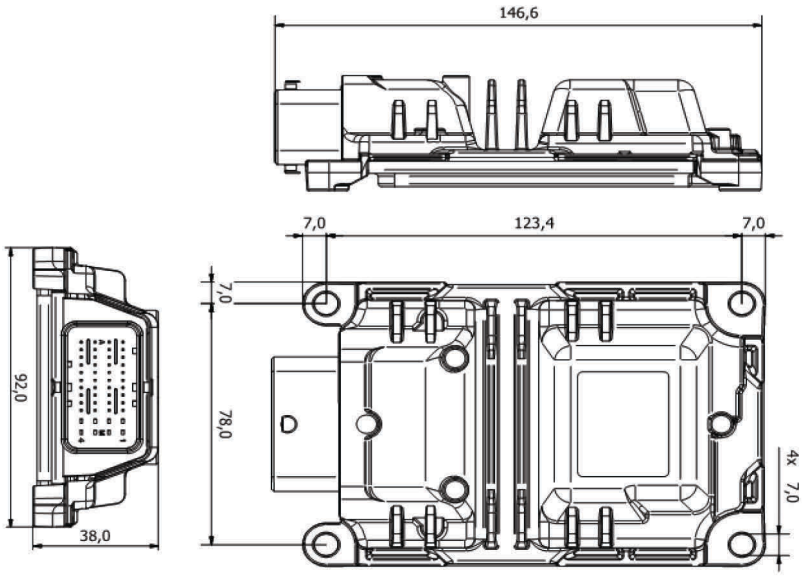
Block diagram



Housing and connector

Aluminum die-cast housing

1 x 48 pin connector



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