

Universal Off-Highway Control – TTC 200

General Description

TTC 200 is a powerful electronic solution for the off-highway industry that relies on its equipment to function under the most difficult conditions.

TTC 200 was designed to comply with the IEC 61508 international standard. The stand-alone version and the network version with TTP[®] fulfill SIL 2 (Safety Integrity Level) and SIL 3 requirements respectively. It is part of a complete and compatible product family and is protected by a robust housing suited to the off-highway industry.

Specifications

Parameter		Unit
Dimensions	234 x 181 x 48	mm
Weight	790	g
Operating Temperature	-40 to +85	°C
Operating Altitude	0 to 4000	M
Supply Voltage	9 to 32	V
Peak Voltage	45	V _{max}
Current Consumption	1 at 9V	A _{max}
Environmental Specifications		
Funct. Safety stand-alone	IEC 61508 SIL2	
Funct. Safety TTP networked	IEC 61508 SIL3	
Protection Degree	DIN 40050 IP65	
Vibration, Shock, Bump	IEC 68-2-64, -27, -29, -6	
EMC	ISO/DIS 13766	
ESD	IEC 61000	
Temperature Environment	IEC 68-2-1, -2, -3, -14, -30	
Load Dump	ISO 7637	

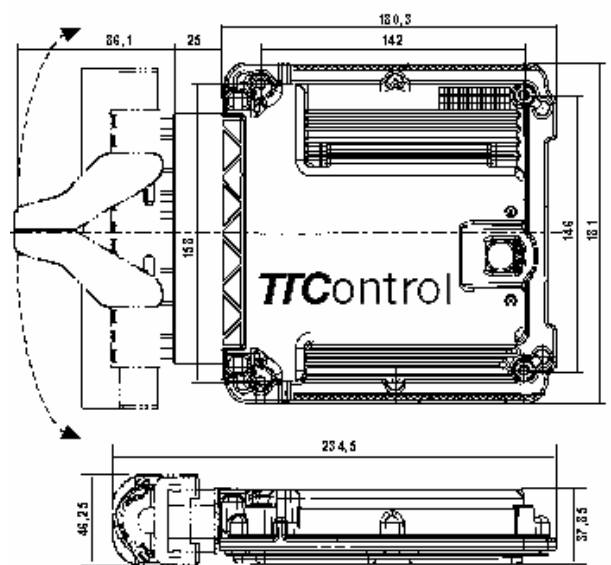
Outline Dimensions

- Aluminum injection-molded housing
- Splash-proof 154 pin connector
- Pressure adjusting with water barrier
- Housing fins for optimal temperature deduction



Features

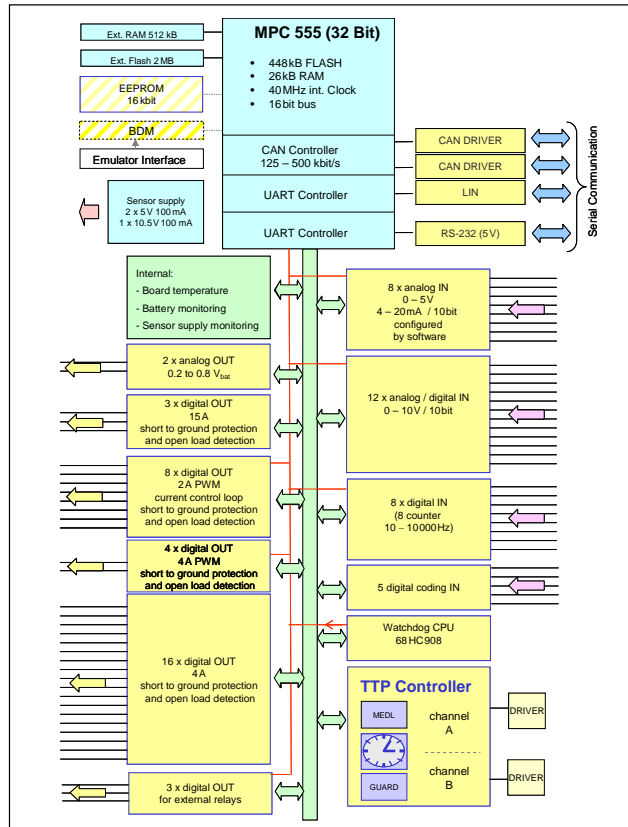
- MPC555, 40 MHz, 448 kB int. Flash, 26 kB int. RAM, 512 kB ext. RAM (opt. 1 MB ext. RAM), 2 MB ext. Flash
- 16 kbit EEPROM
- Watchdog CPU Freescale HC 908, including monitoring software
- 1 x TTP bus with redundant channels
- TTP communication controller AS8202NF
- 1 x RS-232 and 1 x LIN serial interfaces
- 2 x CAN, 125 to 500 kbit/s
- 8 x analog IN 0 to 5V or 4 to 20 mA / 10 bit, configured by software
- 12 x analog / digital IN 0 to 10V / 10 bit
- 8 x digital IN (counter 10 Hz to 10 kHz)
- 5 x digital IN for TTP encoding number for hardware identification
- 8 x digital OUT 2.35A, PWM, current control loop, short to ground protection and open load detection
- 4 x digital OUT 4A, PWM, short to ground protection and open load detection
- 16 x digital OUT 4A, short to ground protection and open load detection
- 3 x digital OUT 15A, short to ground protection and open load detection (1 x with wind screen wiper option)
- 3 x digital OUT for external relays to switch off output for safely applications (fail-silent)
- 2 x analog OUT, 0.2 to 0.8V_{bat}
- Internal: monitoring of board temperature, sensor supply and battery
- 1 x sensor supply 10.5V
- 2 x sensor supply 5V
- Safety: modular safety concept for distributed and stand-alone systems
- Software: TTP[®]Matlink, Simulink[®], C/C++, CoDeSys[®] 2.3



Cervis Incorporated, North American Partner of TTControl

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Block Diagram



Ordering Information

Available Options		Device Numbering System	TTC 200	n	n	n	n	n	n
TTC 200	M L C D CD S	RAM							
TTC 200	X L C D CD S	M: 512 kB							
TTC 200	M L T D NA S	X: 1 MB							
TTC 200	M L C D NA S	Serial interfaces							
TTC 200	M L C W CD S	L: LIN on SCI 1, RS-232 on SCI2 (default)							
TTC 200	X L C W CD S	Bootloader							
TTC 200	M L T W NA S	C: CAN – Enables download via CAN 2.0B							
TTC 200	M L C W NA S	T: TTP – Enables download via TTP, requires TTP toolsuite							
TTC 200	M L T D NA O	Watchdog*)							
TTC 200	M L C D NA O	D: Dummy – no monitoring is performed, outputs are permanently enabled							
TTC 200	M L T W NA O	W: Watchdog enabled – required for SIL 2 and SIL 3 application, needs configuration based on application-dependent safety-concept and cyclical service							
TTC 200	M L C W NA O	Firmware							
		CD: CoDeSys Run-Time-System – for CoDeSys development environment							
		NA: No firmware – for use without CoDeSys (e.g. C programming)							
		Housing							
		S: Sealed (default)							
		O: Open – option for connecting BDM debuggers (e.g. for C programming)							

Unlabeled options are available on request

*) The software-watchdog monitors the MPC 555 microcontroller and the I/Os and activates the safe state (switches off all outputs) if an error is detected