**General Description**

HY-TTC 508 is a high-end electronic control solution for the off-highway industry. The core of the controller is the powerful TMS570 CPU designed for use in demanding safety-critical automotive and transportation applications. The HY-TTC 508 fulfills safety requirements up to SIL 2 (IEC 61508) / PL d (ISO 13849) and AgPL d (ISO 25119). The HY-TTC 508 is part of a complete and compatible product family and is protected by a compact, automotive-style housing suited to mobile applications.

**Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU dimensions</td>
<td>231.3 x 204.9 x 38.8 mm</td>
</tr>
<tr>
<td>Dimensions for minimum connector release clearance</td>
<td>315.3 x 204.9 x 38.8 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1,200 g</td>
</tr>
<tr>
<td>Connector</td>
<td>154 pins</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 to +85 °C</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>0 to 4,000 m</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>8 to 32 V</td>
</tr>
<tr>
<td>Peak supply voltage</td>
<td>45 Vmax</td>
</tr>
<tr>
<td>Supply current at 12/24 V without load</td>
<td>400/200 mAmax</td>
</tr>
<tr>
<td>Standby current</td>
<td>&lt;1 mAmax</td>
</tr>
<tr>
<td>Total load current</td>
<td>40 Amax</td>
</tr>
</tbody>
</table>

**Standards**

- Functional safety: IEC 61508 SIL2
- CE-Mark: 2014/30/EU
- E-Mark: ECE-R10 Rev.4
- EMC: EN 13309
- ISO 14982
- CISPR 25
- EN 61000-6-2/4
- ESD: ISO 10605
- Electrical: ISO 16750-2
- ISO 7637-2/3
- Ingress protection: EN 60529 IP67
- ISO 20653 IP66k9
- Climatic: ISO 16750-4
- Mechanical: ISO 16750-3
- ISOBUS: ISO 11783

**Features**

**CPU Core**
- 32-bit TI TMS570, ARM cortex-R4F based
- Dual-core lockstep CPU and memory protection for safety-relevant applications
- 180 MHz, 298 DMIPS, Floating-Point Unit
- 3 MB int. Flash, 256 kB int. RAM
- 16 MB ext. Flash, 2 MB ext. RAM, 64 kB ext. EEPROM
- Safety Companion CPU

**Interfaces**
- 2 x CAN 50 kbit/s up to 1 Mbit/s
- 1 x CAN ISOBUS
- 3 x CAN bus termination configurable via connector pins
- 1 x 100BASE-T1 BroadR-Reach®
- 1 x Real-Time Clock

**Outputs**
- 10 x PWM OUT or digital OUT, up to 4 A, high side, with high side current measurement
- 8 x digital OUT up to 4 A, high side, overload and open load detection, current sense, alternative use as LED control OUT or analog IN 12-bit, 0 - 32 V with configurable pull-up/down
- 8 x digital OUT up to 4 A, low side, current sense, overload and open load detection, alternative use as analog IN 12-bit, 0 - 32 V
- Wiring option to use up to 8 of the digital OUT, high side and 8 digital OUT, low side, as full H-bridge for motor control

**Multi-purpose I/Os**
- 6 x configurable as
  - PVG OUT, 10 - 90% of BAT+ or voltage OUT, 0 - 100% of BAT+ or digital OUT up to 4 A high side or
  - LED control OUT or analog IN 12 bit, 0 - 32 V

**Inputs**
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 25 mA, 0 - 100 kOhm
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 10 V, 0 - 25 mA
- 8 x analog IN 12-bit, 0 - 5 V, 0 - 32 V, 0 - 25 mA
- 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, digital (7/14 mA) current loop speed-sensor, alternative use as analog IN 12-bit, 0 - 32 V
- 6 x digital timer IN (0.1 Hz - 20 kHz), encoder supporting digital voltage sensors with configurable pull-up/down, alternative use as analog IN 12-bit, 0 - 32 V
- 8 x digital timer IN (0.1 Hz - 10 kHz) with pull-up
- K15 and wake up

**Sensor supply**
- 1 x sensor supply, 5 V, max. 500 mA

**Software**
- C-Programming environment

All I/Os and interfaces are protected against short circuits to GND and BAT+ and can be configured by software. Board temperature, sensor supply and supply voltage are monitored by software. Inputs and Outputs can also be used as digital Inputs. Two independent shut-off groups for PWM output stages are available. Details about the standards can be found in the System Manual.
Block Diagram

Housing and connector
Aluminum die-cast housing
154-pin connector