High Performance Safety Controller – HY-TTC 508

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 (EN ISO 13849), AgPL d (ISO 25119) and ASIL C (ISO 26262).

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 V&lt;sub&gt;max&lt;/sub&gt;</td>
</tr>
<tr>
<td>Supply current at 12/24 V without load</td>
<td>400/200 mA&lt;sub&gt;max&lt;/sub&gt;</td>
</tr>
<tr>
<td>Standby current</td>
<td>&lt;1 mA&lt;sub&gt;max&lt;/sub&gt;</td>
</tr>
<tr>
<td>Total load current</td>
<td>40 mA&lt;sub&gt;max&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Standards

- Functional safety: IEC 61508 SIL2, EN ISO 13849 PL d, ISO 25119 AgPL d, ISO 26262 ASIL C
- CE-Mark: 2014/30/EU, 2006/42/EC
- 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 IP66K5k
- Climatic: ISO 16750-4, EN 50581
- 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

Inputs

- 8 x analog IN 12-bit, 0 - 32 V
- 6 x digital timer IN (0.1 Hz - 10 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, digital (7/14 mA) current loop speed-sensor alternative use as analog IN 12-bit, 0 - 32 V
- 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
- 1 x K15 and wake up

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
- 6 x digital OUT, low side, as full H-bridge for motor control

Sensor supply

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

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

TMS 570
ARM Cortex

Dual-core lockstep
- 32-bit / 180 MHz
- 256 kB RAM
- 3 MB Flash
- Safety Companion

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

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

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