The HY-TTC 510 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>1200 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 4000 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 12/24V 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**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional safety</td>
<td>IEC 61508 SIL2, EN ISO 13849 PL d</td>
</tr>
<tr>
<td>CE-Mark</td>
<td>2014/30/EU, 2006/42/EC</td>
</tr>
<tr>
<td>E-Mark</td>
<td>ECE-R10 Rev.4</td>
</tr>
<tr>
<td>EMC</td>
<td>EN 13309, ISO 14982, CISPR 25</td>
</tr>
<tr>
<td>ESD</td>
<td>ISO 10605</td>
</tr>
<tr>
<td>Electrical</td>
<td>ISO 16750-2, ISO 7637-2, -3</td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>EN 60529 IP67, ISO 20653 IP6k9k</td>
</tr>
<tr>
<td>Climatic</td>
<td>ISO 16750-4</td>
</tr>
<tr>
<td>Mechanical</td>
<td>ISO 16750-3</td>
</tr>
</tbody>
</table>

**Features**

- 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 flash, 256 kB int. RAM
- 2 MB ext. RAM, 64 kB ext. EEPROM
- Safety Companion CPU

**Interfaces**

- 3 x CAN 50 kbit/s up to 1 Mbit/s
- 3 x CAN bus termination configurable via connector pins
- 1 x LIN

**Outputs**

- 16 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 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, 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/O’s**

- 8 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**

- 2 x sensor supply, 5 V, max. 500 mA
- 1 x sensor supply, 5 – 10 V, max. 2.5 W, configurable by SW in 1 V steps

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.

Inputs and Outputs can also be used as digital Input.

Two independent shut-off groups for PWM output stages.

Details to 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

Interfaces

IN / OUT

1 K15 Key Switch
1 Wake-Up
8 analog IN 0–5 V / 0–25 mA / 0–100 kOhm
8 analog IN 0–5 V / 0–10 V / 0–25 mA
8 analog IN 0–5 V / 0–32 V / 0–25 mA
6 digital timer IN 0.1 Hz – 20 kHz or digital timer IN 7/14 mA or analog IN
6 digital timer IN 0.1 Hz – 20 kHz or analog IN
8 digital timer IN 0.1 Hz – 10 kHz with pull-up

1 Sensor supply 5 V / 500 mA
2 Sensor supply 5-10 V
16 HS PWM OUT up to 4 A with current measurement
8 HS digital OUT up to 4 A with current sense or LED ctrl OUT or analog IN
8 LS digital OUT up to 4 A with current sense or analog IN
8 HS digital OUT up to 4 A or PVG OUT or voltage OUT

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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