General Description

The HY-TTC 32 is a compact control unit specially developed for use in cost-sensitive applications or smaller machines. The device is based on an Infineon XC22xx microcontroller and supports programming in C and CODESYS® V2.3. With its 30 freely configurable I/Os it can be operated with a wide variety of sensors and actuators.

The 32 version is best suited for controlling proportional functions. Six out of the eight PWM outputs have integrated current measurement which means, for example, up to three hydraulic axes can be current controlled. The HY-TTC 32 was specially developed for vehicles and machines used in rugged operating environments and at extreme operating temperatures. The device is protected by a proven, robust and compact housing, specially designed for the off-highway industry.

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECU Dimensions</td>
<td>mm</td>
</tr>
<tr>
<td>Dimensions for Minimum</td>
<td>mm</td>
</tr>
<tr>
<td>Connector Release Clearance</td>
<td>mm</td>
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<tr>
<td>Weight</td>
<td>g</td>
</tr>
<tr>
<td>Connector</td>
<td>pins</td>
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<tr>
<td>Operating Temperature</td>
<td>°C</td>
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<tr>
<td>Operating Altitude</td>
<td>m</td>
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<tr>
<td>Supply Voltage</td>
<td>V</td>
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<tr>
<td>Peak Supply Voltage</td>
<td>Vpeak</td>
</tr>
<tr>
<td>Max Idle Current</td>
<td>mA</td>
</tr>
<tr>
<td>Standby Current</td>
<td>mA</td>
</tr>
<tr>
<td>Total Load Current</td>
<td>Amax</td>
</tr>
</tbody>
</table>

Standards

- Functional Safety: Designed for ISO 13849 PL b
- CE-Mark: 2014/30/EU
- E-Mark: ECE-R10 Rev.4
- EMC: EN 13309, ISO 14962, CISPR 25, EN 61000-6-2/-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 IP67, ISO 26953 IP6K9k
- Climatic: ISO 16750-4
- Mechanical: ISO 16750-3

Features

CPU Core
- Infineon XC22xx 16/32 bit CPU running at 80 MHz
- 768 kByte int. Flash, 82 kByte int. RAM, 8 kByte EEPROM

Interfaces
- 2 x CAN, 125 kbit/s up to 1 Mbit/s
- 1 x CAN bus termination configurable via connector pins

Outputs
- 6 x PWM OUT or digital OUT, up to 3 A, high side switch with current measurement, overload and open load detection
- alternative use digital timer IN (10 Hz - 10 kHz) or analog IN 0 - 32 V both with integrated Pull-Up
- 2 x PWM OUT or digital OUT, up to 3 A, high side switch with overload detection, open load detection and support for high inrush current loads
- alternative use digital timer IN (10 Hz - 10 kHz) or analog IN 0 – 32 V both with integrated Pull-Up
- 2 x digital OUT, up to 3 A, low side switch with overload and open load detection
- alternative use analog IN, 0 - 32 V with integrated Pull-Up

• 6 x PVG OUT
  - 15 % - 85 % BAT+ with PVG valve
  - alternative use voltage OUT 0 V - 75 % BAT+ with 10 kOhm low side load or analog IN 0 – 32 V

Inputs
- 4 x digital timer IN (0.1 Hz - 10 kHz)
- 1 x rotary encoder configurable Pull-Up/Down in digital IN mode
- 4 x analog IN, configurable in software
  - 0 - 5V / 10 V IN
  - 0 - 25 mA IN
  - 0 - 65 kOhm IN
  - up to 25 mA LED control OUT
- 4 x analog IN, configurable in software
  - 0 - 5V / 10 V IN
  - 0 - 25 mA IN
  - up to 25 mA LED control OUT
- 2 x analog IN 0 - 32V
  - configurable Pull-Up/Down in digital IN mode

Other
- 1 x sensor supply 5 V, 100 mA
- Internal monitoring of board temperature, sensor supply, K15 input and battery voltage

Software
- C Programming Environment
- CODESYS® V2.3 including support for CANopen® Master

All I/Os and interfaces are protected against short circuit to GND and BAT+ and can be configured by software.
All analog inputs use 10 bit resolution.
All analog voltage inputs can be used as digital inputs with configurable switching levels and hysteresis.
Dedicated power supply pins for high side outputs.
Details to the standards can be found in the user manual.
**Block Diagram**

**Infineon XC22xx**

**CPU core**
- 16/32 bit / 80 MHz
- 82 kB RAM
- 768 kB Flash

**INTERFACES**

**1** K15 Key Switch
- digital timer IN
  - 0.1 Hz – 10 kHz or analog IN
  - with configurable Pull-Up/Down

**4**
- analog IN
  - 0-5 V / 0-10 V / 0-25 mA / 0-55 kOhm or LED control OUT

**4**
- analog IN
  - 0-32 V with configurable Pull-Up/Down

**1**
- Sensor supply
  - 5 V / 100 mA

**1**
- CAN

**6**
- HS PWM OUT
  - up to 3 A with current measurement or digital timer IN
  - 0.1 Hz – 10 kHz or analog IN

**2**
- HS PWM OUT
  - up to 3 A or digital timer IN
  - 10 Hz – 10 kHz or analog IN

**2**
- LS digital OUT
  - up to 3 A or analog IN

**6**
- PVG OUT or voltage OUT or analog IN

**Housing and Connector**

Aluminum die-cast housing

48-pin connector, 1 connector chamber

Mating connector: FCI PPI0001494 or PPI0001495
Molex 64320-1311 or 64320-3311

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

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