

## Hydraulic Safety Control Unit HY-TTC 32S

### General Description

The HY-TTC 32S 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. With its 28 freely configurable I/Os it can be operated with a wide variety of sensors and actuators.

The HY-TTC 32S was developed following the international standard EN ISO 13849 and is certified by TÜV NORD. It meets the requirements of Functional Safety according to Performance Level (PL) d.

The 32S version is best suited for controlling proportional functions in safety applications. Six out of the eight PWM outputs have integrated current measurement which means that, for example, up to three hydraulic axes can be current controlled. The HY-TTC 32S 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

| Parameter  |  | Unit             |
|--|--|------------------|
| ECU Dimensions                                     | 147 x 92 x 38  | mm               |
| Dimensions for Minimum Connector Release Clearance | 208 x 92 x 38  | mm               |
| Weight   | 330  | g                |
| Connector  | 48   | pins             |
| Operating Temperature                              | - 40 to + 85   | °C               |
| Operating Altitude                                 | 0 to 4000  | m                |
| Supply Voltage                                     | 8 to 32  | V                |
| Peak Supply Voltage                                | 40   | V <sub>max</sub> |
| Max Idle Current                                   | ≤120   | mA               |
| Standby Current                                    | ≤1   | mA               |
| Total Load Current                                 | 24   | A <sub>max</sub> |
| <b>Standards</b>                                   |  |                  |
| Functional Safety                                  | EN ISO 13849 PL d  |                  |
| CE-Mark  | 2014/30/EU<br>2006/42/EC   |                  |
| E- Mark  | ECE-R10 Rev.4  |                  |
| EMC  | EN 13309<br>ISO 14982<br>CISPR 25<br>EN 61000-6-2/-4                                 |                  |
| ESD  | ISO 10605  |                  |
| Electrical   | ISO 16750-2<br>ISO 7637-2,-3,<br>limited to 40 V by external<br>load dump protection |                  |
| Ingress Protection                                 | EN 60529 IP67<br>ISO 20653 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, PL d capable 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, PL d capable 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 used as redundant switch-off path for high side PWM outputs
- 6 x PVG OUT  
15 % - 85 % BAT+ with PVG valves alternative use voltage OUT 0 V - 75 % BAT+ with 10 kOhm low side load or analog IN 0 - 32V

#### Inputs

- 4 x digital timer IN (0.1 Hz - 10 kHz), PL d capable if used in pairs alternative use analog IN, 0 to 32V 1x rotary encoder configurable Pull-Up/Down in digital IN mode
- 4 x analog IN, configurable in software, input functions are PL d capable if used in pairs  
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, input functions are PL d capable if used in pairs  
0 - 5V / 10 V IN      0 - 25 mA IN  
up to 25 mA LED control OUT
- 2 x analog IN 0 - 32V, PL d capable if used in pairs 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

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.

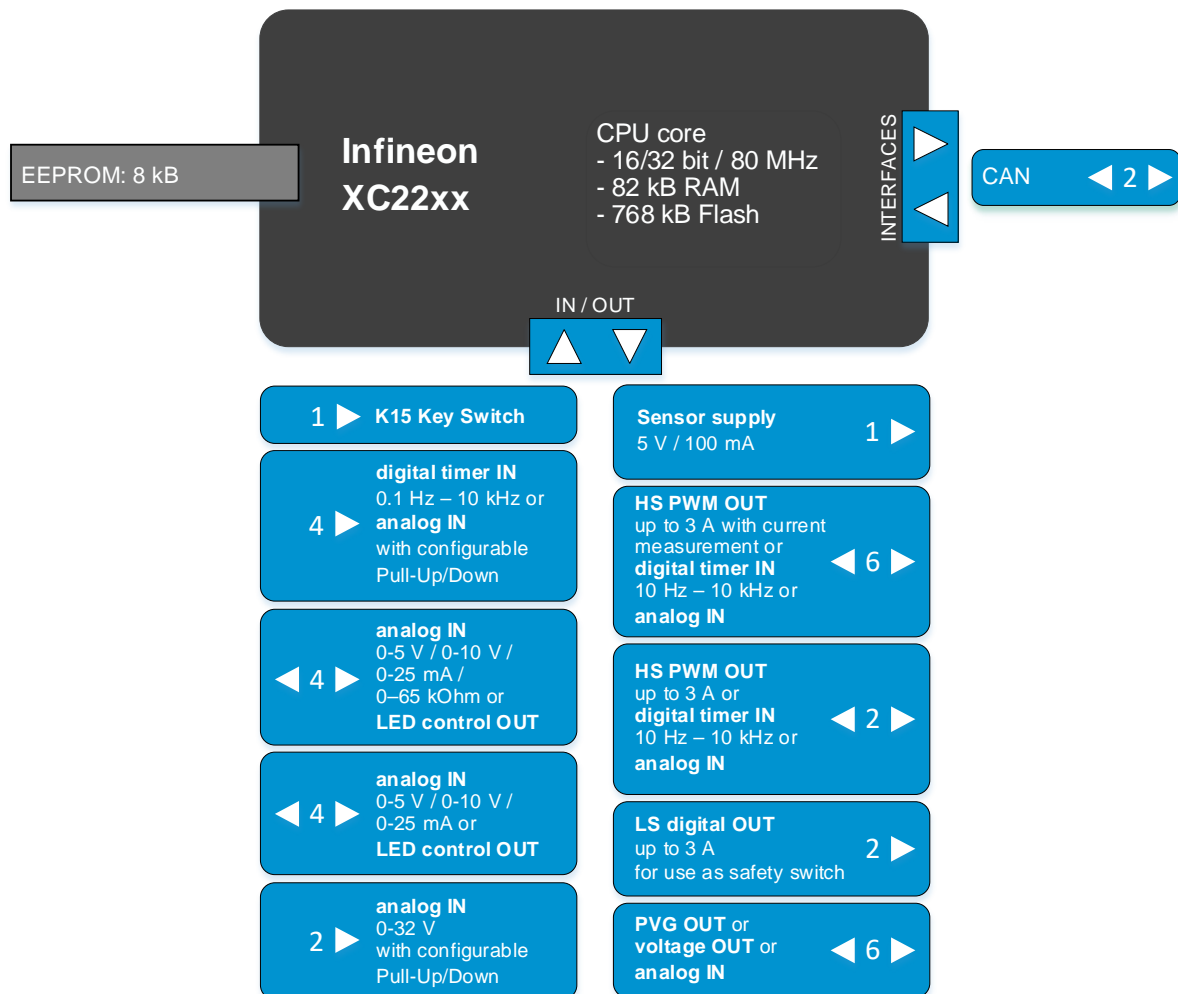
All analog voltage inputs can be used as digital inputs with configurable switching levels and hysteresis.

Dedicated power supply pins for high side outputs.

For safety functions two PL d capable inputs of the same type have to be used in parallel to provide redundancy in case of a failure.

Details to the standards can be found in the user manual.

**Block Diagram**

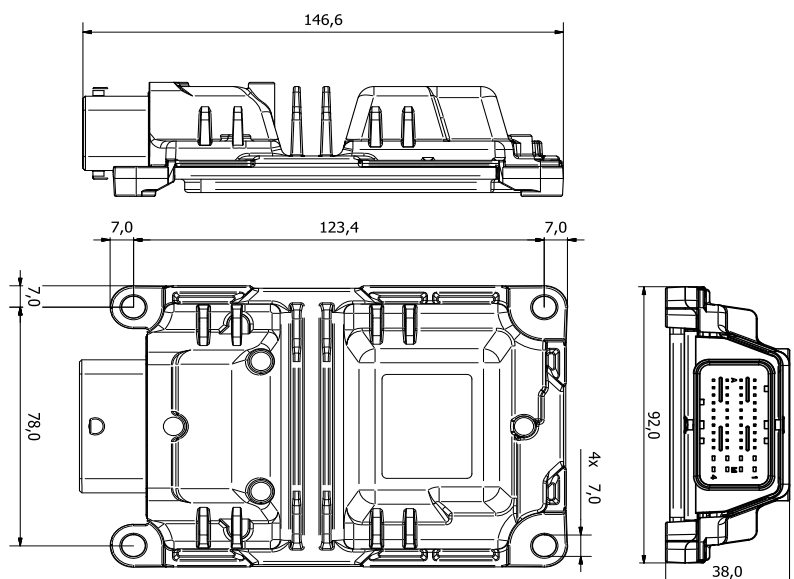


**Housing and Connector**

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](mailto:products@ttcontrol.com).

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