



Universal Mobile Controller HY-TTC 90

Functional Safety
PL d
SIL 2



Description

The HY-TTC 90 and the HY-TTC 94 are safety-certified and are the most powerful controllers in the 16 bit controller series. They meet all the technical requirements of modern vehicle electronics in the off-highway sector.

The HY-TTC 90 was developed in accordance with the international standards IEC 61508 and ISO/EN 13849 and is certified by TÜV Nord. It thus meets the requirements of the safety levels **SIL 2 (Safety Integrity Level 2)** and **PL d (Performance Level d)**.

For the CPU, it uses the safety CPU XC2287M which was specially developed by Infineon for safety applications. This offers enhanced safety features for the protection of the internal RAM and Flash memories.

Special features

- **SIL 2 / PL d certified**
- Additional watchdog CPU
- Programming in CODESYS® 2.3 or C/C++
- 570 kB RAM
- 48 inputs and outputs, including
 - 16 power outputs
 - 4 current measuring inputs
 - 8 analogue inputs: voltage / current
 - 8 analogue inputs: voltage, configurable
- All inputs and outputs are configurable and are protected against overvoltage and short circuits
- Stabilized, adjustable sensor voltage supply with internal monitoring
- No reset caused by dip in voltage when engine is started
- Robust aluminium die cast housing with a waterproof 80-pole male connection and pressure equalization via a waterproof Gore-Tex® membrane
- e12 type approval

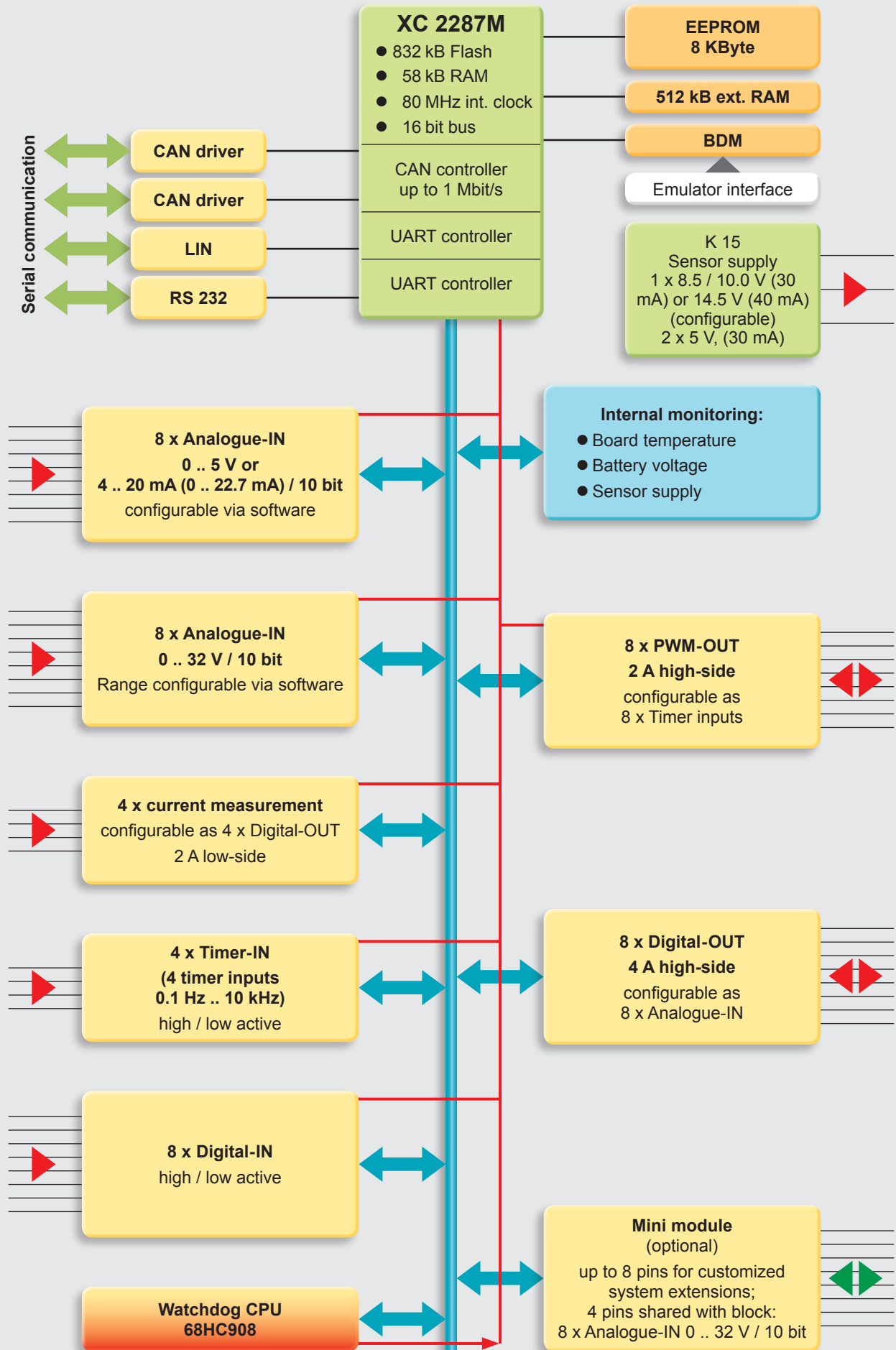
Technical data

| Ambient conditions | |
|---|---|
| Operating temperature | -40 .. +85 °C (with full load) to EN 60068-2 |
| Operating altitude | 0 .. 4,000 m |
| Supply voltage | 8 .. 32 V |
| Permitted voltage drop | up to ≥4 V (U _{Bat}) without reset to ISO 7637-1 (for engine start in 12 V systems) |
| Peak voltage | 45 V max. (1 ms) |
| Idle current | 0.15 A max. at 9 V |
| Standby current | 0.5 mA max. |
| Current consumption | 25 A max. (complete voltage and temperature range) |
| Fulfils the following standards | |
| CE mark | Compliant with 2004/108/EC |
| E-mark | 2009/19/EC |
| Functional safety | IEC 61508 -SIL 2- EN ISO 13849 -PL d- |
| EMC | ISO 13766 (up to 200 V/m, 20 MHz .. 1 GHz) |
| ESD | IEC 61000-4-2 |
| Load dump | ISO 7637-2 |
| Protection class | EN 60529 IP 65 / IP 67 DIN 40050 IP 6k9k |
| Temperature | EN 60068-2-1; -14Nb; -2; -78; -30 |
| Vibration, shock, bump | IEC 60068-2-29; -64; -27; -32 |
| Dimensions and weight | |
| Housing dimensions | 148 x 181 x 40 mm |
| Minimum clearance for connection | 198 x 203 x 40 mm |
| Weight | 656 g |
| Features | |
| 16-Bit Infineon XC2287M microcontroller, 80 MHz, 832 kB int. Flash, 58 kB int. RAM, 512 kB ext. RAM | |
| 8 KByte EEPROM | |
| Watchdog CPU freescale HC 908, including monitoring software | |
| 1 x RS-232 and 1 x LIN serial interfaces | |
| 2 x CAN, up to 1 Mbit/s | |
| 128 individually configurable CAN message buffers | |
| 8 x Analogue-IN 0 .. 5 V or 4 .. 20 mA (0 .. 22.7 mA) / 10 bit, configurable via software | |
| 8 x Analogue-IN 0 .. 32 V / 10 bit, range configurable via software | |
| 4 x current measurement, configurable as 4 x Digital-OUT / low-side 2 A | |
| 4 x Timer-IN (timer input 0.1 Hz .. 10 kHz) | |
| 8 x Digital-IN | |
| 8 x PWM-OUT 2 A high-side, configurable as 8 x Timer inputs | |
| 8x Digital-OUT 4 A high-side, configurable as 8 x Analogue-IN | |
| Optional mini module (8 pins for customized system extension) | |
| Internal monitoring of board temperature, sensor supply and battery voltage | |
| Connector types: 52-pole Tyco PN 1393450-5 / 28-pole Tyco PN 1393436-4 | |
| 1 x sensor supply 8.5 V / 10.0 V (30 mA) or 14.5 V (40 mA) configurable | |
| 2 x sensor supply 5 V (30 mA) | |
| Programming: CODESYS® 2.3; C/C++ | |

Note: All I/Os and interfaces are protected against short circuit to GND and BAT+.

Block circuit diagram

HY-TTC 90



Model code

HY-TTC 90 – XX – 570K – 832K – WD XX – 000

Firmware

CD = CODESYS® run-time system
for CODESYS® development environment
CP = for “C/C++” programming without CODESYS®

RAM memory (internal and external)

570K = 570 kByte

Flash memory (internal and external)

832 K = 832 kByte

Functional safety

WD = watchdog with standard software

Equipment options

00 = none
01 = fast current filter
02 = 4x additional current measurements
03 = 4x additional current measurements with current filters

Modification number

000 = standard

Note:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Accessories

Appropriate accessories, such as cables and connectors, service tools, software etc. can be found in the Accessories section.

Note

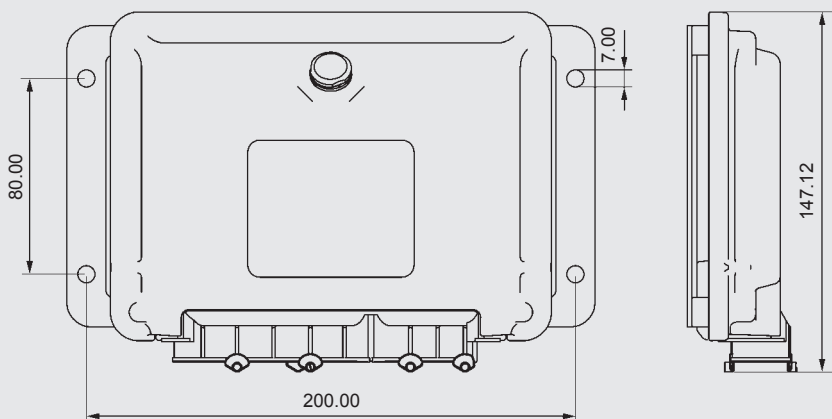
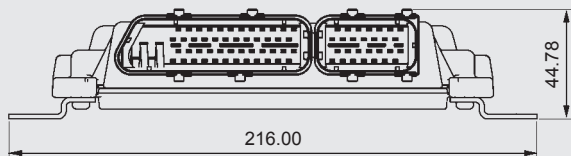
The information in this brochure relates to the operating conditions and applications described.

For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

Dimensions

52-pole Tyco PN 1393450-5 / 28-pole Tyco PN 1393436-4



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