



I/O Expansion Module HY-TTC 48XS

Functional safety
PL d

Description

The HY-TTC 48XS module is an intelligent I/O module which is certified according to EN 50325-5 via CANopen Safety and which can be driven and parameterised according to CiA DS 401.

The HY-TTC 48XS module was developed in accordance with the international standard ISO/EN 13849 and is certified by TÜV Nord. Therefore, it meets the requirements of safety levels **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.

The module is protected in a proven, robust and compact housing, specially designed for the off-highway automotive industry.

Special features

- **PL d certified**
- Additional watchdog CPU
- 48 inputs and outputs:
 - 16 power outputs
 - 4 current measurement inputs
 - 8 analogue inputs: voltage/current
 - 8 analogue inputs: voltage, configurable
 - 12 digital inputs
- All inputs and outputs are configurable and are protected against overvoltage and short circuits
- Stabilised, adjustable sensor voltage supply with internal monitoring
- No reset caused by voltage drop when starting engine
- 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

Environmental conditions

Operating temperature	-40 .. +85 °C (full load) acc. 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 2014/30/EU, 2006/42/EC
E-mark	ECE-R10 Rev. 4
Functional safety	EN ISO 13849 PL d
EMC	ISO 13766 (up to 100 V/m, 20 MHz .. 1 GHz)
ESD	IEC 61000-4-2
Load dump	ISO 7637-2, 173V, 2 Ohm, 350 ms
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
Communication profile	CANopen CiA DS 401/EN 50325-5

Dimensions and weight

Housing dimensions	148 x 181 x 40 mm
Minimum clearance for connection	198 x 203 x 40 mm
Weight	664 g

Features*

16-Bit Infineon XC2287M microcontroller, 80 MHz, 832 kB int. Flash, 50 kB int. RAM, 512 kB ext. RAM, 8 kByte EEPROM
 Watchdog CPU freescale HC 908, including monitoring software
 CRC checker for supervising Flash memory, Integrated Memory Protection Unit (MPU), Error-Correcting Code (ECC)
 1 x CAN, 125 kbit/ .. 1 Mbit/s

IN

8 x Analogue IN 0 .. 5 V or 4 .. 20 mA/10 bit, configurable via software or 0 .. 65 kilohm
 8 x Analogue IN 0 .. 32 V/10 bit, range configurable via software, pull-up/down configurable
 4 x current measurement, configurable as 4 x Digital OUT/2 A low-side
 4 x Timer IN (Timer inputs 0.1 Hz .. 10 kHz), Timer IN (7/14 mA), Analogue IN (0 .. 5 V), pull-up/down configurable
 8 x Digital IN, pull-up/down configurable

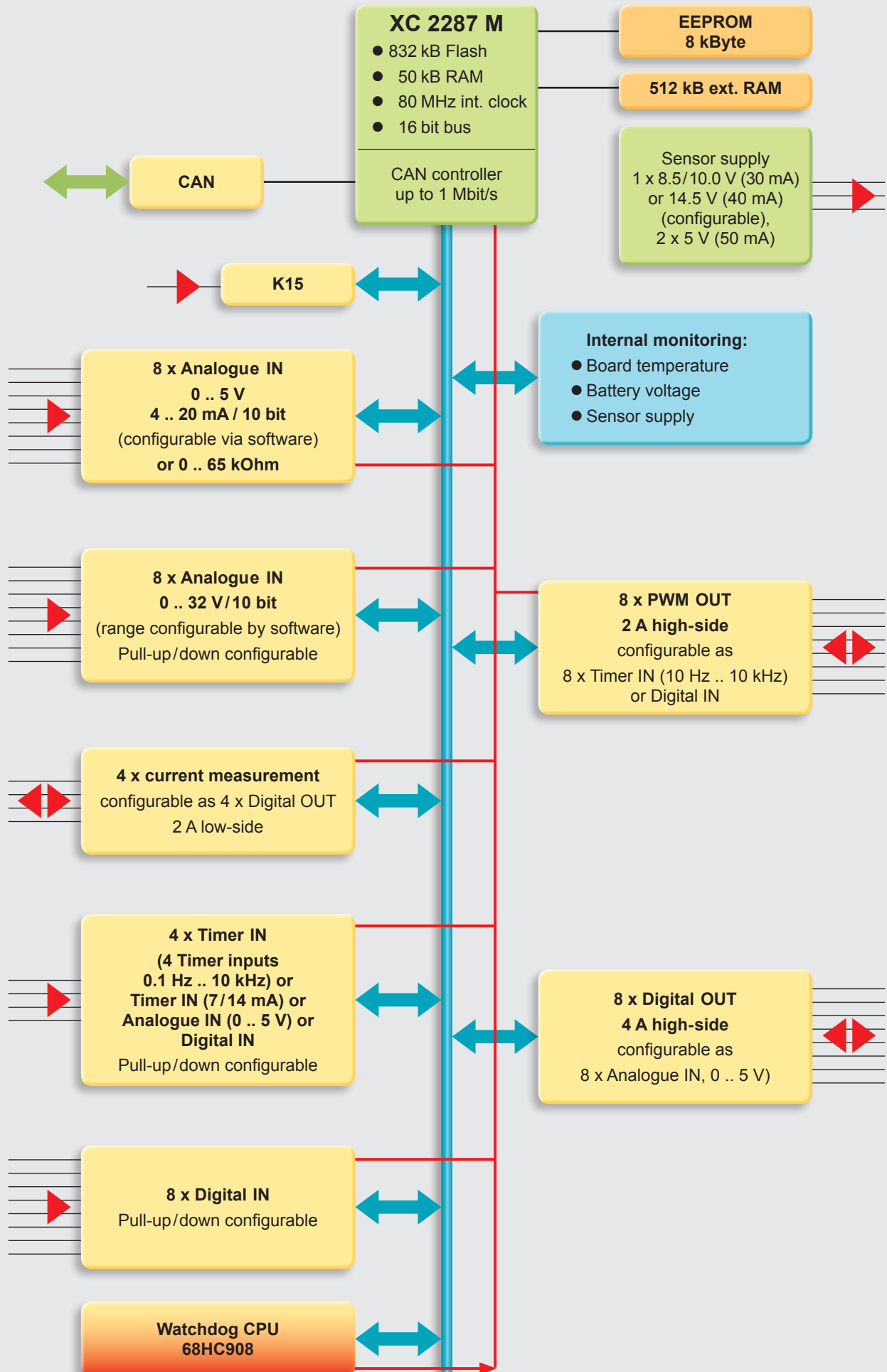
OUT

8 x PWM OUT 2 A high-side, configurable as 8 x Timer IN (10 Hz .. 10 kHz), Digital IN
 8 x Digital OUT 4 A high-side, configurable as 8 x Analogue IN (0 .. 5 V)
 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)/14.5 V (40 mA) configurable
 2 x sensor supply 5 V (50 mA)

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

Block circuit diagram

HY-TTC 48XS



Model code

HY-TTC 48XS – F13 – 00 – Pd – 000

CAN protocol

F13 = CANopen safety

Equipment option

00 = standard

01 = 250 kbit/s CAN baud rate

Functional safety

Pd = Performance Level d

Modification number

000 = standard

Note

On devices with a different modification number, please read the name plate or the technical amendment details supplied with the device.

Accessories

Appropriate accessories, such as cable harnesses, cabling and connection technology, service tools and software can be found in the Accessories section.

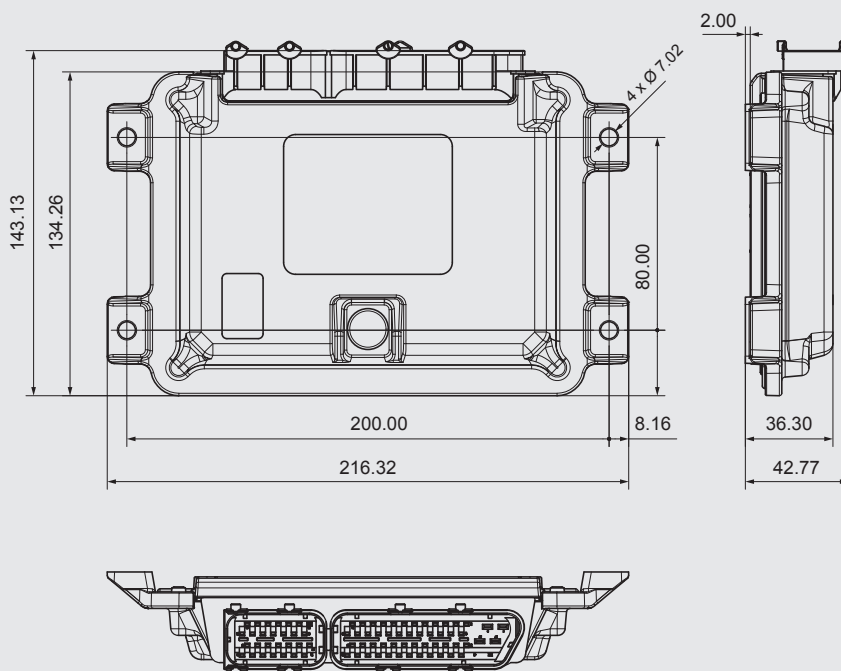
Note

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

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

Subject to technical modifications and corrections.

Dimensions



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