

## Universal Off-Highway Control – HY-TTC 77

### General Description

HY-TTC 77 is a powerful electronic control solution for off-highway industries with 12V power supply. The HY-TTC 77 is equipped with the Infineon XC2288H CPU, providing enhanced safety features for protecting internal RAM and flash. It is part of a complete and compatible product family and is protected by a compact, automotive-style housing suited to mobile applications.

### Specifications

Parameter		Unit
ECU Dimensions	143,13 x 216,32 x 42,77	mm
Dimensions for minimum connector release clearance	197,7 x 216,32 x 42,77	mm
Weight	595	g
Operating Temperature	-40 to +85 (at full load) -40 to +105 (at part load)	°C
Operating Altitude	0 to 4000	m
Supply Voltage	7 to 16	V
Peak Voltage	28	V <sub>max</sub>
Standby Current	0.5	mA <sub>max</sub>
Idle Current	0.15 at 9V	A <sub>max</sub>
Current	35	A <sub>max</sub>
<b>Fulfills the following standards</b>		
CE-Mark	2014/30/EU	
E- Mark	ECE-R10 Rev.4	
EMC	EN 13309 ISO 14982 CISPR 25	
ESD	ISO 10605	
Electrical	ISO 16750-2 ISO 7637-2,-3	
Ingress Protection	EN 60529 IP67 ISO 20653 IP6k9k	
Climatic	ISO 16750-4	
Mechanical	ISO 16750-3	



### Features

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

#### CPU core

- 16/32-bit Infineon XC2288H safety microcontroller, 80 MHz, 1.6 MB int. Flash, 138kB int. RAM
- 32kB ext. EEPROM
- CPU-internal safety features
  - Hardware CRC checker for supervising flash memory
  - Integrated Memory Protection Unit (MPU)
  - RAM content protection through Error-Correcting-Code (ECC)
- Watchdog CPU Freescale HC 908, including monitoring software

#### Interface

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

#### Outputs

- 12 x PWM OUT, up to 2.5 A, high side with timer feedback, 6 of them with current feedback; alternative use digital timer IN (10Hz to 10kHz); 3 output groups can be switched off independently for limp-home in case of failure
- 6 x PWM OUT, up to 2.5 A, high side with voltage feedback; up to 4 A for individual outputs
- 8 x digital OUT, up to 2.5 A, high side; up to 4 A for individual outputs

#### Inputs

- 4 x analog IN, configurable in software
  - 0 – 5 V                      0 - 25 mA
  - 0 – 65 kOhm                digital IN low side
- 8 x analog IN, 0 to 5 V
- 8 x analog IN, 0 to 10 V  
alternative use  
digital IN high side/low side
- 2 x analog IN, 0 to 15 V
- 8 x analog IN, 0 to 15 V or digital IN
- 2 x digital timer IN (0.1 Hz to 10kHz) low side
- 7 x digital IN high side

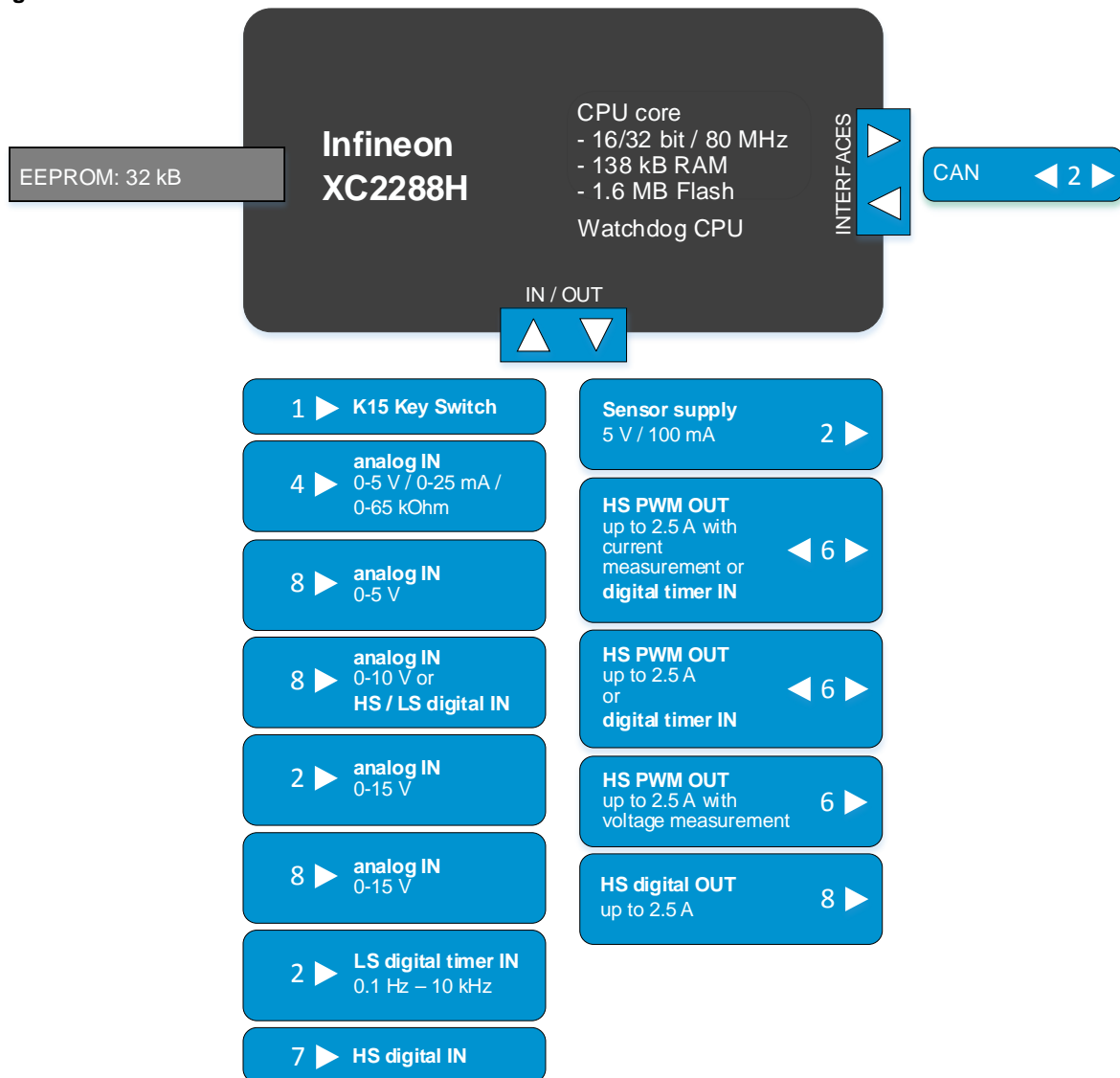
#### Other

- Internal: monitoring of board temperature, sensor supply and battery
- 2 x sensor supply 5V, 100 mA
- 3 x analog sensor ground
- 1 x digital sensor ground

#### Software

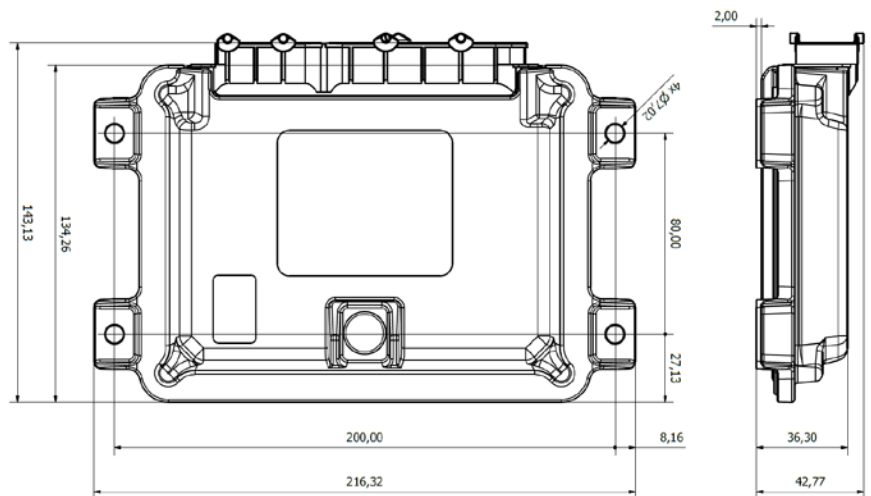
- Programming: C

**Block Diagram**



**Housing and Connector**

- Aluminum pressure die-cast housing
- Water-proof 80-pin connector
- Pressure adjusting with water barrier



For further information, including price and availability, please contact [products@ttcontrol.com](mailto:products@ttcontrol.com)

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