ACU6-Pro Off Highway

ACU6-Pro Off Highway is aimed at customers requiring the latest in terms of secure connectivity as well as a powerful computation environment. The flexible concept means that the product can be configured for a wide range of off highway applications such as asset management and machine control. ACU6-Pro Off Highway supports worldwide cellular deployment in a single product variant. Together with its flexible subscription management, ACU6-Pro Off Highway forms part of ACTIA's 'end to end' solution.

User applications are simple to implement using the onboard software development kit (SDK). These can be created by ACTIA or directly by the customer.

The product consists of a fixed 'base' section and an adaptable 'customer' section. The customer section is available with a standard generic content which can be adapted (i.e. interfaces, connector type, …) on customer request. A LIN based expansion port allows peripherals to be added at a later date. Inclusion of antennas for all radio functions as well as the optional backup supply results in a self-contained function and simplifies product integration.

Future evolutions of ACU6-Pro Off Highway include e.g. key items such as 5G cellular compliance and support for ISO26262.

Wireless:
LTE Cat 4. WiFi. Bluetooth. GNSS. Internal antennas for all radio functions. RF ports for connection of external antennas with diagnostics (except BLE) and GNSS phantom feed.

Network:
Ethernet 100BASE-T1 port (TC10), Ethernet 100BASE-TX and USB2.0 port as well as dual CAN FD interfaces.

Middleware:
Software Development Kit (SDK) with libraries provides full support for customer applications such as data management and processing.

Upgrade:
Software download is supported via the electrical network/s and 'over the air' via the cellular or WiFi radio link.

Supply:
The flexible supply concept supports operation with 12V, 24V and 48V systems. The optional battery ensures that critical functions continue if the main supply is lost and ensures clean shutdown and network de-registration.

Subscription:
eUICC – Connectivity subscription setup is pre-loaded with 'multi-IMSI profile'. Customer SIM can be used.

Processing:
System operation managed by a dual core 'system on chip'. Each 64 bit ARMv8_A Cortex-A35 core offers 2000 DMIPS. LPDDR4 RAM 2GByte and 8GByte eMMC as standard (both can be scaled upwards).

Security:
Secure boot supported. Data security is ensured by use of a 'trusted execution environment' and 'signed software'.

Electrical interfaces:
Serial interfaces (RS232, RS485, 1-Wire, LIN expansion). Digital/analogue/frequency inputs. Flightmode input. Highside / Lowside outputs. Main supply / On-Off input.

Internal sensors and indicators:
XYZ-axis accelerometer, three LEDs and temperature sensor.

Technical specification

Cellular modem

LTE 3GPP Rel.9
• Global LTE Cat 4 modem with 3G/2G fallback, DL max. 150Mbps, UL max. 50Mbps

Supported frequency bands:
• FDD-LTE (4G): B1, B2, B3, B4, B5, B7, B8, B12, B13, B18, B19, B20, B26, B28, B66
• TD-LTE (4G): B38, B40, B41
• WCDMA (3G): B1, B2, B3, B4, B5, B6, B8, B9, B19
• GSM (2G): 850, 900, 1800, 1900 MHz

WiFi and Bluetooth

Simultaneous access point (AP) and station mode (STA) operation 801.11 a/b/g/n/ac operation on 2.4GHz and 5.0GHz. Bluetooth 4.2.

Positioning

Satellite positioning based on GPS, Glonass, Beidou, Galileo. Accuracy <3m.

CPU

Dual core 64 bit ARM V8 Cortex A35 processor (quad core as option).
2GByte LPDDR4 RAM and 8GByte eMMC Flash as standard – both scalable upwards.
Real time clock (RTC).

Supply

Primary supply:
• Operating voltage: 8V to 72V
• Consumption @12V: 500mA (normal)
                                 <8mA (standby)
                                 <150µA (sleep)

Optional backup battery:
• 1000mAh (replaceable)

Wakeup sources:
• Cellular activity (standby mode)
• CAN inputs
• ON/OFF (Kl.15) input
• Digital inputs
• RTC trigger
• Internal Accelerometer/Gyro
• Main supply disconnect / Backup supply low

Internal sensors and indicators

• 3 x LEDs (Red, Green, Blue)
• XYZ accelerometer 2g – 16g
• XYZ gyro 125°/s – 2000°/s
• Temp sensor -40°C – 125°C

Interfaces

Generic interface setup (configurable / adaptable):
• 4 x Analogue / Digital / Frequency inputs
• 1 x High side output (500mA)
• 1 x Low side output (500mA)
• 1 x 1-Wire port
• 1 x LIN based expansion port

Serial data interfaces:
• 1 x Ethernet 100BASE-T1
• 1 x Ethernet 100BASE-TX
• 1 x USB2.0 (device mode)
• 2 x CAN FD (with partal networking) / 1 x termination
• 1 x RS232
• 1 x RS485

Connectors

• 1 x Main connector: Tyco SUPER SEAL 6437288-1
• 1 x Ethernet T1: Rosenberger HSD (Green)
• 1 x Ethernet TX: Rosenberger HSD (Blue)
• 4 x External RF antenna ports

Dimensions

• H 155mm x D 110mm x H 40mm
• Weight <500g

Environment

• Temperature: -40°C – +85°C
• IP67 / IP6K9K (with connectors mated)

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