ACU6-Pro Off Highway

ACU6-Pro Off Highway is an 'off the shelf' solution, aimed at customers requiring the latest in terms of secure connectivity as well as a powerful computation environment. A Base software package is provided to support 3rd party applications developed by the customer or by ACTIA and partners. Further applications can be added using 'over the air' updates, even when the product has been deployed.

ACU6-Pro Off Highway supports worldwide cellular deployment and connectivity in a single product variant. Together with the device manager, ACU6-Pro Off Highway forms part of ACTIA's 'end to end' solution.

Typical applications include machine monitoring and control and asset management.

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 rich set of interfaces allows for connection of different types of peripheral. Inclusion of antennas for all radio functions as well as the 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.

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

Subscription:
Virtual MNO setup which supports global roaming with selective localisation.

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

Processing:
System operation managed by a dual core 'system on chip'. Each 64-bit ARMv8-A Cortex-A35 core offers 2800 DMIPS. LP-DDR4 RAM 2GByte and 32GByte eMMC as standard.

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

Security:
Secure boot supported. Data security is ensured through Encrypted Data Storage. HSM is provided for security applications (e.g. key storage).

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

Electrical interfaces:
Serial interfaces (RS232 and RS485).
Digital/analogue/frequency inputs.
Highside output, Lowside output.
ONSW digital input (KL.15 key on/off)

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

Internal sensors and indicators:
XYZ-axis accelerometer and gyro
Three LEDs (1 x Red, 1 x Blue, 1 x Green)
Temperature sensor.

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ACTIA®

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 (40 & 41 can be added at later stage for specific regions)
- WCDMA (3G): B1, B2, B3, B4, B5, B6, B8, 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 ARMv8-A Cortex-A35 processor.
- 2GByte LPDDR4 RAM and 32GByte eMMC Flash as standard.
  Real time clock (RTC).

Supply

Primary supply:
- Operating voltage: 8V to 60V
- Consumption @12V: 500mA – 1000mA (normal)
  <10mA (standby)
  <400µA (sleep)

Backup battery:
- 1000mAh (replaceable)

Wakeup sources (hardware support):
- Cellular SMS/IP data (when in standby mode)
- CAN1, CAN2 activity
- RTC trigger
- Internal Accelerometer
- Main supply disconnected
- 2 x digital inputs
- ONSW (Kl.15) input

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

General interfaces:
- 4 x Analogue / Digital / Frequency inputs
- 2 x Digital inputs (with maskable wakeup)
- 1 x High side output (500mA)
- 1 x Low side output (500mA)
- 1 x ONSW (Kl.15) input

Serial data interfaces:
- 1 x Ethernet 100BASE-T1 & 1 x Ethernet 100BASE-TX
- 1 x USB2.0 (host mode)
- 2 x CAN FD (with partal networking) / 1 x termination
- 1 x RS232 and 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 Fakra RF antenna ports

Dimensions

- W 155mm x D 114mm x H 43mm
- Weight <600g

Environment

- IP6K5 with connectors mated
- Temperature: -40°C – +70°C (+85°C in product evolution)