

# UCB

On Board Unit

Datasheet



Rev. 1.0

---

All copyright and industrial rights in this document and in the technical knowledge it contains are owned by Powersoft and/or the third parties rightfully concerned.

No part of this document nor any data herein shall be disclosed, reproduced or used for any purpose whatsoever without the prior written consent of POWERSOFT as foreseen by the law.

Drawings and specifications are subject to change.

All trademarks and registered trademarks are the property of their respective holders.

Printed in Italy.

---

## REVISIONS LIST

REV.	DATA	Autor	Note
1.0	06/2013	G. Raschellà	First edition
1.1	03/2016	G. Raschellà	GPS data upgrade

---

## Introduction

The UCB device provides the following main features:

- Vehicle localization by a last generation GPS receiver supporting EGNOSWAAS and inertial navigation (Dead Reckoning) where the GPS signal covering is low or absent. In fact, it includes an odometer input and a 3-axis gyro.
- Vehicle operative states acquisition, like: key ON, driver login, star service, open door, stop, position, traveled meters, alarms, faults etc. These data are stored in the not volatile memory of the unit.
- Sending of the data to the Center by GPRS connection.
- Data download/upload management between vehicle and central repository by WLAN connection in the vehicle parking.
- Communication with the on board peripherals like scrolling text panels, ticket validators and dispensers, etc.
- Passenger information management using scrolling test panel and loudspeakers.

The on board central unit uses a microprocessor with an appropriately sized RAM to satisfy every the computing power requirement. The Operating System, de applications and the data are store on a solid-state memory.

UCB is conform to the following requirements:

- Modularity: in terms of hardware and software
- Flexibility: parameterizations and configuration bases on specific requirements
- Accessibility: availability of remote maintenance tools
- Expandability: thanks to the modular architecture and the “state of the art” of the used solutions, UCB can interface with other on board peripheral.
- Reliability and availability: the use of “non custom” components, allows the reproducibility, the reliability and the time availability
- Easy installation.

## Internal architecture

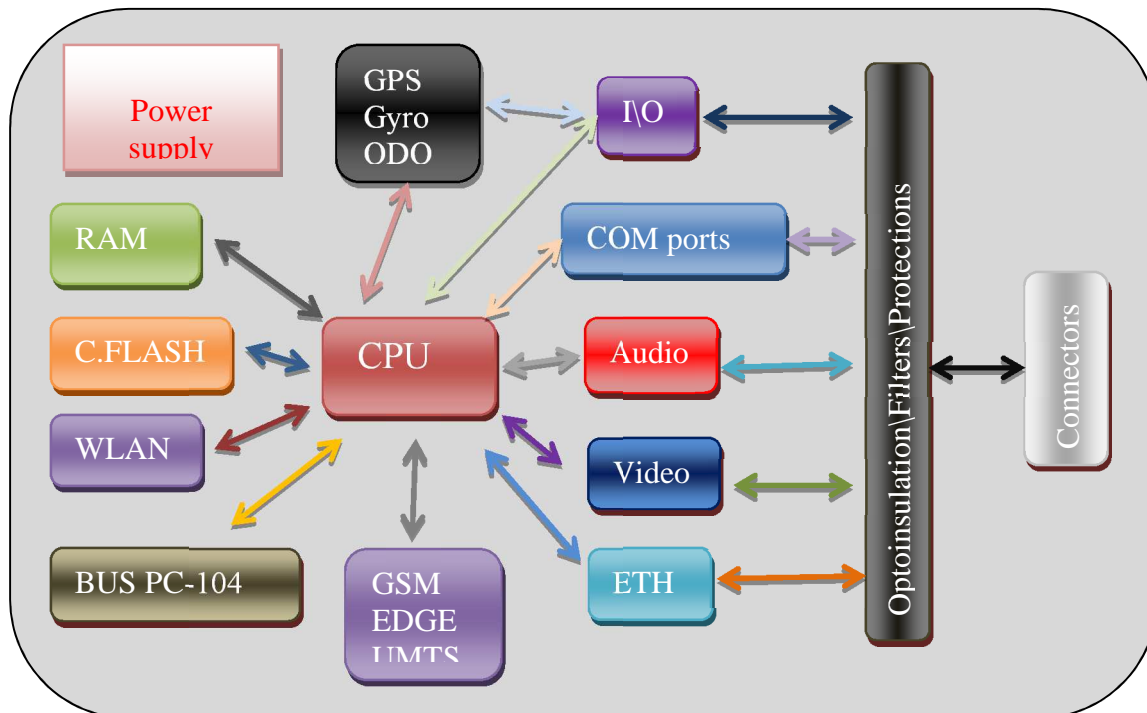
The unit is composed by the following components:

- PC board
- Signal pocessing board
- Localization module with GPS and Gyroscope



- Power supply board with audio amplifier
- WLAN board
- GPRS/UMTS communication module (optional)

The following picture shows the UCB internal architecture:



The unit is completely modular and open. The internal configuration is scalable upwards and downwards allowing, in particular, to enrich the device with new features that require more internal resources. Furthermore, the fact of integrating components and standard interfaces allows easy availability over time of devices that replace components that should go in obsolescence. The presence of PC-104 bus allows to interface all the cards on the market, that meet this standard, that implement various functionality.

---

## External interfaces

UCB platform, based on PowerDriver, interfaces with the external peripheral by the following connectors:

- Main connector with power supply, and main signals
- Service connector with the signal used for the normal work
- Aux connector with signals for advanced functions.
- GPS Antenna
- GMS/GPRS Antenna
- Wireless Antenna

## Detailed specifications

- Dimensions and weight: 260L x 160W x90H mm, 2.8Kg
- Processor: x86 from 800MHz to 1.6GHz
- RAM: 512MB expandable
- Audio: line in and mic in
- Video: LVDS or VGA
- GPS: from 56 channels, fix rate up to 10 per sec.
- Gyroscope: 2 axis for dead reckoning (optionally 3 axis)
- Power supply: 8 ÷ 32 Vdc
- Solid-state memory support: Compact Flash from 1 GB up
- Battery: internal for the RTC
- Interfaces:
  - N°2 USB 2.0
  - N°1 Ethernet 10/100MB
- Inputs:
  - N° 5 optoinsulated digital
  - N° 3 optoinsulated digital (Optional)
  - N° 1 optoinsulated for KEY ON/OFF signal
  - N° 4 analog
  - N° 1 optoinsulated for odometer signal
- Output:
  - N° 4 relais
  - N° 4 open collector (Optional)
  - Hold signal for the internal DC/DC.
- N.2 audio channels
- External serial ports:
  - N° 4 RS232
  - N° 4 RS232/485/422
- Communication module: quad band GSM/GPRS modem. UMTS (optional)

- WLAN board: 2.4GHz prot. 802.11 b, g (Atheros or Ralink chipset)
- N° 1 CAN bus 2.0b optoinsulated port + 1 optional
- Expansion Bus: PC-104
- GSM audio interface: 2 balanced channels for handfree and handset
- Certified S.O.: Linux, Win E, WinXP Embedded, Win CE 6.0
- Water and dust protection degree: IP65
- Operating temperature: -30°C/+65°C
- Operating humidity: 5% - 95%
- Maximum power consumption: 20W

## Dead Reckoning

Thanks to the vehicle odometer interface and the gyro integrated into the device, the UCB is able to provide its position (inertial mode called Dead Reckoning) even though the GPS signal is low or absent (tunnels, tree-lined avenues, etc...). The inertial data are integrated in the navigation algorithm with GPS coverage also present, allowing for further improvement of data positioning in difficult conditions such as urban canyons and tree-lined avenues.

## Certifications:

- Automotive “e” according the Directive 95/54/CE and 2004/104/CE upgraded with the Directive 2005/49/CE, 2005/83/CE e 2006/28/CE
- Certificate of conformity according to the standard CEE 89/336 e CEI EN 55022 e CEI EN 55024 (EMC)
- Certificate of conformity (Expert opinion IMQ) according to the Directive 1999/05/EC e R&TTE (EMC)
- Certificate of conformity according the Directive CEI EN 60950 (Electrical Safety)
- Certificate of conformity according the Directive CEI EN60150 as required by the Directive 99/05/CE and CEE 73/23 (Electrical Safety and Low Voltage)
- Certificate of conformity according the Directive 94/55/CE and EN60529 (recepita dalla CEI 70-1) (grado di protezione IP65)
- Certificate of conformity according the Directive EN 60068 (vibration tests)
- Certificate of conformity according to the standard IEC 68-2-1/2 (climatic tests)
- Certificate of conformity according to the standard EN50155 (railway applications)
- Certificate of conformity according to the standard EN50261 (installation requirements)
- Certificate of conformity according to the standard CEI EN 61000-4-5 (electrical insulation)
- EN50204 (Radio interference immunity test) Certificate
- ETSI 300 019 (Environmental conditions and environmental tests for telecommunications equipment) Certificate
- Self-declaration EN50126 (Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety)