CANpanion^{TM}

A FLEXIBLE AND POWERFUL PLATFORM FOR CAR PROTOTYPING TESTS AND ENGINEERING WITH FUSION FROM MULTIPLE SIGNALS SOURCES (CANBUS, GPS, BIOMEDICAL SENSORS) AND DESKTOP DELIVERY OF LOGGED DATA (MATLAB READY)

OVERVIEW

CANpanion^{TM} is a vehicle onboard data acquisition system based on a commercial Ultra-Mobile PC (UMPC) that allows the acquisition, the real time visualization and logging of CAN bus signals, GPS signals and other gathered from additional sensors (e.g. biomedical).

At the end of each testing session **CANpanion^{TM}** allows you sending data wireless. Moreover it can also integrate additional functionalities implemented through high-level algorithms for the real time processing of the acquired signals (e.g. for onboard vehicle diagnostics).

All these features together make **CANpanion^{TM}** a flexible and powerful system for car prototyping tests.

A single user engineer can supervise car tests performed on worldwide sparse vehicles receiving data after recording on his/her desktop ready for analysis.

CANpanion^{TM} is not simply a CAN data logger. It is the base component for other advanced applications (some of which still under development) belonging to the family of **ADS^{TM}** (Attain IT DIAGNOSTIC SOLUTIONS), which aims at rendering more efficient the vehicle development testing and, in real driving, at detecting driving path features for assisting drivers in increasing safety on the roads and improving personal driving style (e.g. reducing fuel consumption).

SOFTWARE DESCRIPTION

CANpanion^{TM} software is a flexible and user friendly application developed in MATLAB[1] environment for:

- recording and logging either in HD or in flash memory multiple signals from the CAN bus (through a CAN/USB interface), the GPS receiver (through Bluetooth connection, and other sensors, such as biomedical sensors (though USB, Bluetooth or WiFi.
- the real time graphical visualization of the acquired signals on configurable multi display windows
- sending the logged data either to a specified FTP and mail servers via a broadband HSDPA/UMTS connection or to a network address via WiFi or wired LAN.

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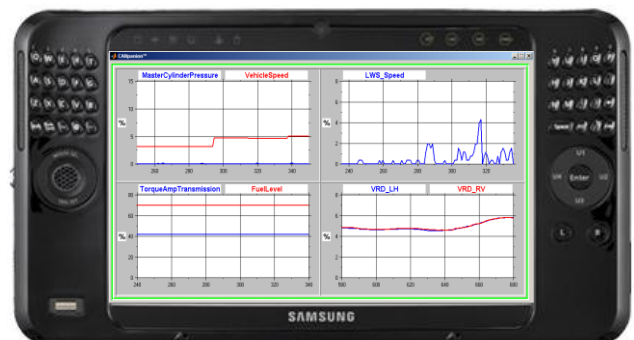
[1] MATLAB® is a product made by Mathworks Inc. (Natick, MA)

The flexibility is guaranteed by:

- the support of CAN database (.dbc) or MS Excel® files for easy reconfiguration for different vehicles
- the easy integration of new sets of signals from additional sensors (e.g. connected via Bluetooth).
- the easy integration of additional software modules for on-board diagnostic or analysis applications

DATA ACQUISITION FORMAT

A key feature of *CANpanion*™ is the robust data logging procedure and the versatility of data files, guaranteed by the compatibility with MATLAB® and Comma Separated Values (.csv) format.
The post-processing tools, *CANpanionTools*™ included in the *CANpanion*™ kit allows the user generating either a MATLAB® or .csv data file, characterized by:

- appropriate tags
- structure information reporting a record of the data origin
- record of the raw CAN messages
- record of the decoded CAN signals
- synchronized matrix with the whole set of CAN signals and GPS biomedical signals.

This data file allows also an easy play back of the message traffic on simulators.

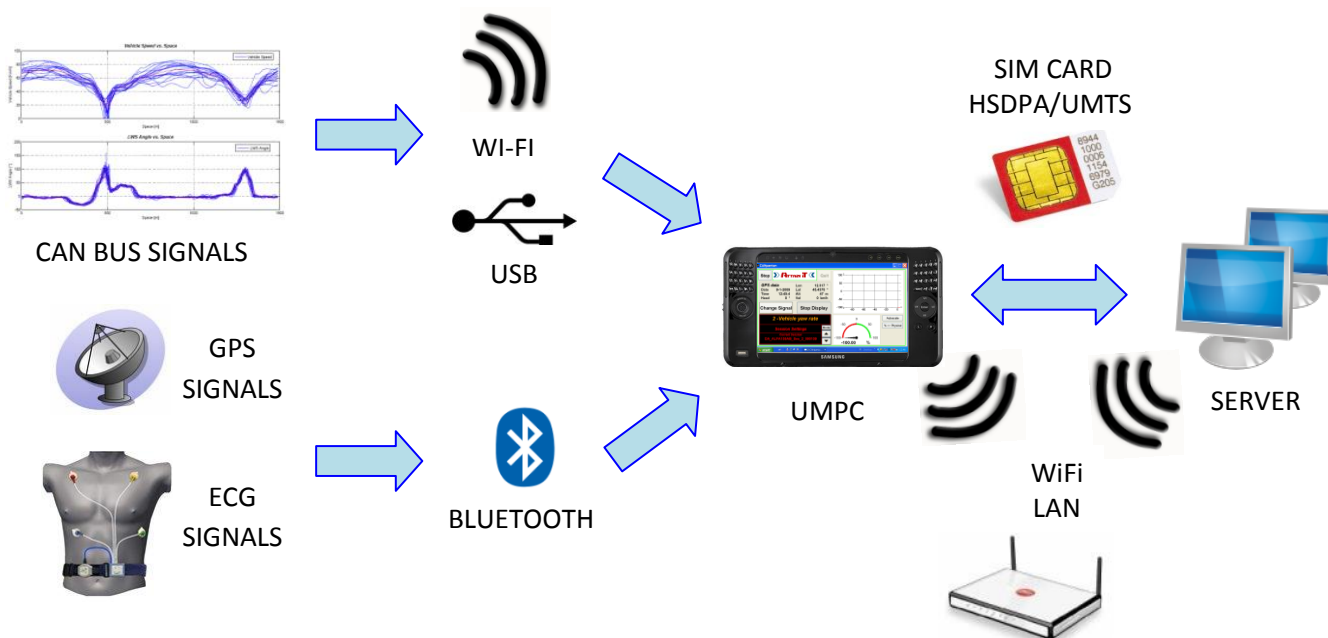## HARDWARE DESCRIPTION AND CONFIGURATION

CANpanion™ is currently implemented on a commercial Ultra-Mobile PC (UMPC), mod. Samsung Q1 Ultra, which is characterized by:

- touch screen monitor
- USB, WLAN and Bluetooth connectivity
- flash memory for data logging
- integrated telephone module (HSDPA/UMTS, EDGE, GPRS, GSM) for sending data logging
- Built in high performance camera with audio and video recording capabilities

CANpanion™ can be implemented on any Windows XP based platform.

The *CANpanion*™ kit includes also other commercial hardware modules represented by:

- CAN/USB or CAN/WLAN interface for connection with vehicle CAN network (e.g. through OBD port)
- GPS receiver with Bluetooth interface (optional)
- Biomedical sensor with Bluetooth interface (optional)
- other analog or digital sensors

CAN BUS SIGNALS

GPS SIGNALS

ECG SIGNALS

WI-FI

USB

BLUETOOTH

UMPC

SIM CARD HSDPA/UMTS

SERVER

WiFi LAN