CELLULAR ON-BOARD DIAGNOSTICS DEVICE

Datasheet

Project objective

Enable the Cellular On-Board Diagnostics (OBD) device with the capability of detecting excessive acceleration, sharp cornering and hard braking during vehicle motions using only an accelerometer module without a gyroscope, considering the variations of the installation position of the device in the cab. The device had to collect a list of vehicle parameters, GPS-coordinates, detect BLE beacons, store the data and send it to the Cloud service. Both Firmware and Configuration updates of the device had to be performed via the air.

The updated device was supposed to help detect extreme vehicle situations, road accidents and prevent incorrect driving.

Result

The delivered device can provide all the critical data to prevent dangerous cases on the road, incorrect driving, and realize predictive maintenance of the whole vehicle fleet. The device can be updated wirelessly.

Scope of work

◈ Porting BTLE and Streamer API drivers to ThreadX OS

◈ Develop interfaces for collecting OBD data, GPS-data, establishing internet connection over LTE CatM radio, for scanning BLE-beacons

◈ Create a specific and highly complex algorithm for computing accelerometer data to calculate installed device orientation, movement vectors, and critical road situation

◈ Develop firmware update of built-in OBD III Streamer device

◈ Providing firmware updates and configuration support over the air

◈ Central Server communication logic implementation to connect the device with the Cloud

◈ Beep Signal and LED logic implementation

◈ Safe shutdown capability implementation

Activities

◈ Protocols review and analysis

◈ Implementation of different interfaces and business logic

◈ Accelerometer data processing implementation

◈ Firmware development and implementation

◈ Testing and debugging

About the project

Technologies

- C/C++
- OTA
- GSM
- LTE-M
- BT
- GPS / GLONASS
- SMS

Platforms

- Altera / Intel
- ARM
- ThreadX RTOS
- STM32
- Quectel BG 96
- Eclipse IDE

Project size

- 2.5 people

Duration

6 months

September 2018 – March 2019