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V2X Automotive IoT

Brief

The V2X (vehicle to everything) is a parasitically powered communications and sensing platform for the Automotive Environment. It adds Internet-of-Things capability to any vehicle produced since 1997. A Raspberry Pi computer runs a Remote Vehicle Interaction (RVI) node, allowing limitless configuration and uses.

Role

I was the primary developer for the V2X hardware and firmware. While employed at Jaguar Land Rover Open Source Technology Center, I was tasked with developing a generic interface for any vehicle with an OBD2 interface. They wanted to test a fleet analytics platform under development by another company. I was allowed 3 design iterations, ending up at a daughter card the same size as a RaspberryPi.

Development

The V2X collaborates with a Raspberry Pi computer. The Pi has the horsepower to run the RVI node, while the V2X provides stand-by functions. Low power is achieved by monitoring the state of the vehicle and only running the Raspberry Pi when needed. Motion is detected by accelerometer and GPS sensors. Vehicle ignition is detected by CANbus activity. Remote administration is available by 2G/3G cellular communication. The V2X controls the periferal devices while the Pi sleeps, monitoring them. It becomes a passthrough when the Pi is active.
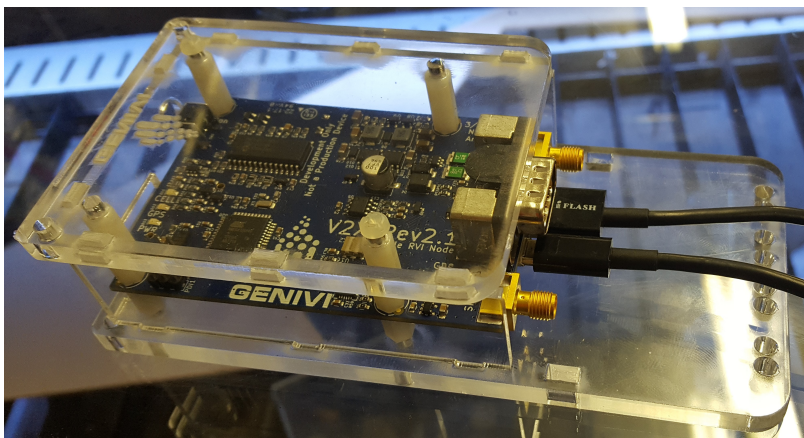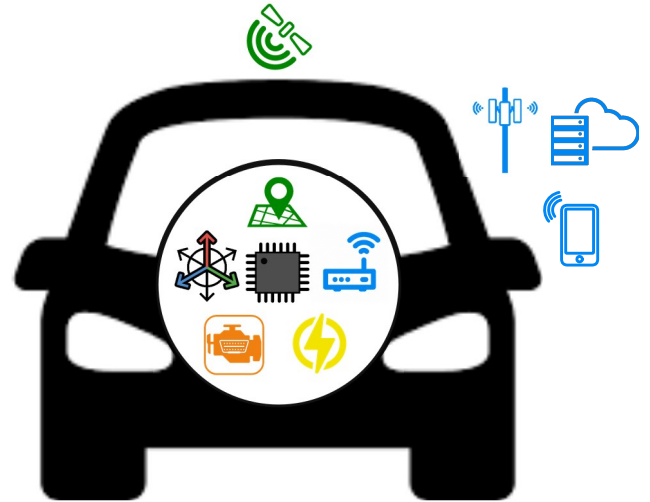
Implementation

Some years after the initial development I was contracted by GENIVI to continue the project. I was a part of a group that built 100 V2X devices, for a trial run of RVI services. The pilot program was paid by the City of Las Vegas. They were testing driver push notifications based on location data.

Timeline: 16 weeks
Delivered: 100 V2X Installation Kits
Cost: ~$20k - 60k