

BREATH ALCOHOL IGNITION INTERLOCK DEVICE INNOVATION WITH IoT

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Background Driving under the influence (DUI) claims many lives annually, causing immeasurable emotional suffering and millions of dollars in economic damage. In 2013 the National Highway Traffic Safety Administration (NHTSA) published the first *Model Guideline to State Ignition Interlock Programs*, which laid out the breath alcohol ignition interlock device (BAIID) model requirements for manufacturers of these devices to follow. A BAIID prevents a person under the influence of alcohol to start a vehicle by requiring a breath sample to be provided to the device. If the device determines that the person's breath alcohol content is higher than the legal limit, the device keeps the vehicle from starting.



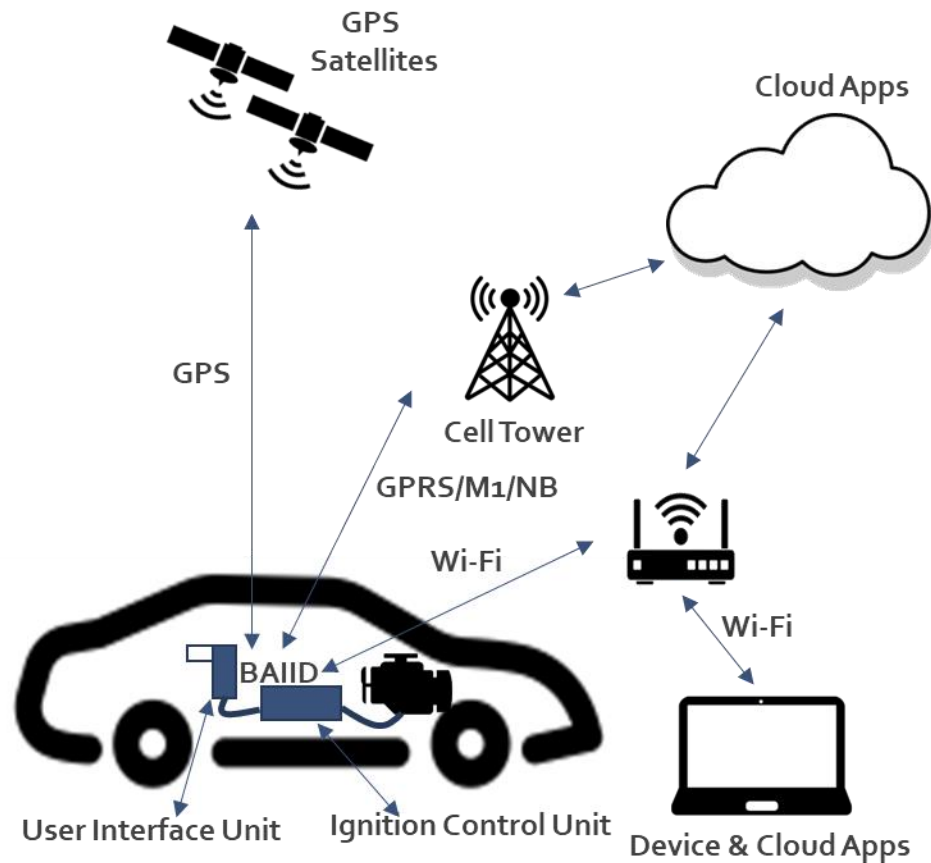
Since the *Model Guideline to State Ignition Interlock Programs* NHTSA publication in 2013, not much changed in BAIID features and functionality. Each BAIID's configuration setup and data access could only be performed off-line, in batch mode, requiring the driver to visit a service center where a technician would connect to the BAIID with a PC over a wired connection.

The Challenge The client needed to leap-frog competition in the Breath Alcohol Ignition Interlock Device market with an innovative BAIID, adding remote access for device configuration and critical device data access to reduce the frequency of service center visits and consequently lower costs and increase customer convenience.

The Process Senzo Labs cross referenced features of the competition's flagship BAIID products with the client's own on the one hand, and on the other hand with its customers' BAIID experiences and the client's own. This resulted in a list of unique and innovative features to improved user and client experiences. These features were captured in comprehensive PRDs and their implementation requirements were captured in detailed ERDs.

A 3rd party design house was selected through an RFP bidding process to accommodate the large scope of the project, with Senzo Labs responsible for overall program management, as well as the implementation of certain parts of the project.

The Solution The product consisted of an embedded device, a Windows-based device configuration app, a cloud-based device inventory management app and a cloud-based device configuration and data upload app. Senzo Labs performed all sensor research, created all proof-of-concepts, wrote all the PRDs and ERDs, designed the system architectures for the device and the software apps, performed all the sensor data analytics, designed and tested all the sensor data processing algorithms, specified all test procedures, designed and implemented the cloud-based device control and data upload app, and designed and implemented an automated manufacturing test platform.



The Outcome The client entered production with a state-of-the-art, cloud connected BAIID product. Senzo Labs resolved multiple challenges working with the 3rd party design house that ensured a robust implementation and saved the client significant development costs. Senzo Labs will be designing and implementing additional Machine Learning algorithms for preventive maintenance and detection of abnormal user patterns as further enhancements.