

How GBE leverages Deep Thought's expertise to sustain it's "Banks iQ" product?

- A brief case study



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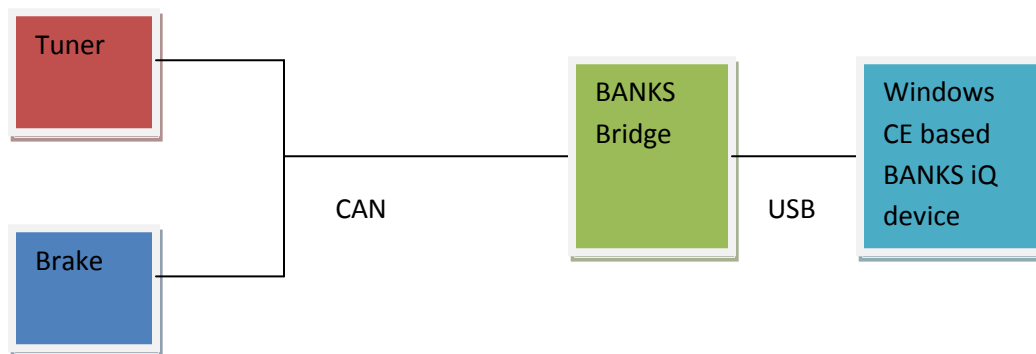
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1. Abstract.

[Gale Banks Engineering](#) is a leading after market performance enhancements product manufacturer in USA which sells their products under the brand name “Banks Power”. Two of the key components in their products are diesel engine tuners and fast acting brakes based on the regenerative breaking technology. These devices were controlled and configured from HMI applications running in a Windows CE device. This application is known as Banks iQ software. Our team members were involved in the design and development of this application which is in the market for about 4 years now. So when it came to do the product sustenance, we became the natural choice as a partner for this work. This case study discusses the details of this application, kind of feature enhancements and bug fixes being implemented, the resources being utilized, processes being followed and overall cost advantage for the client.

2. About Banks iQ application

Banks iQ device is a PND with 5" touch display running Windows CE operating system. The device is USB OTG enabled. Banks iQ software works as the controlling point for Banks Tuner and Speed Brake modules. Tuner and Brake modules are used for enhancing the power and automatically controlling the speed of the vehicles. There is also a generic version of Banks iQ software which can be connected to OBD connector of any vehicle.



Above figure shows the component and connections in the Banks iQ system. The tuner and Speed brake are connected through a CAN network to the Bank's Bridge. Banks Bridge provides data to the Banks iQ software over USB connection. The bridge is USB host capable.

Following are the key features of Banks iQ:

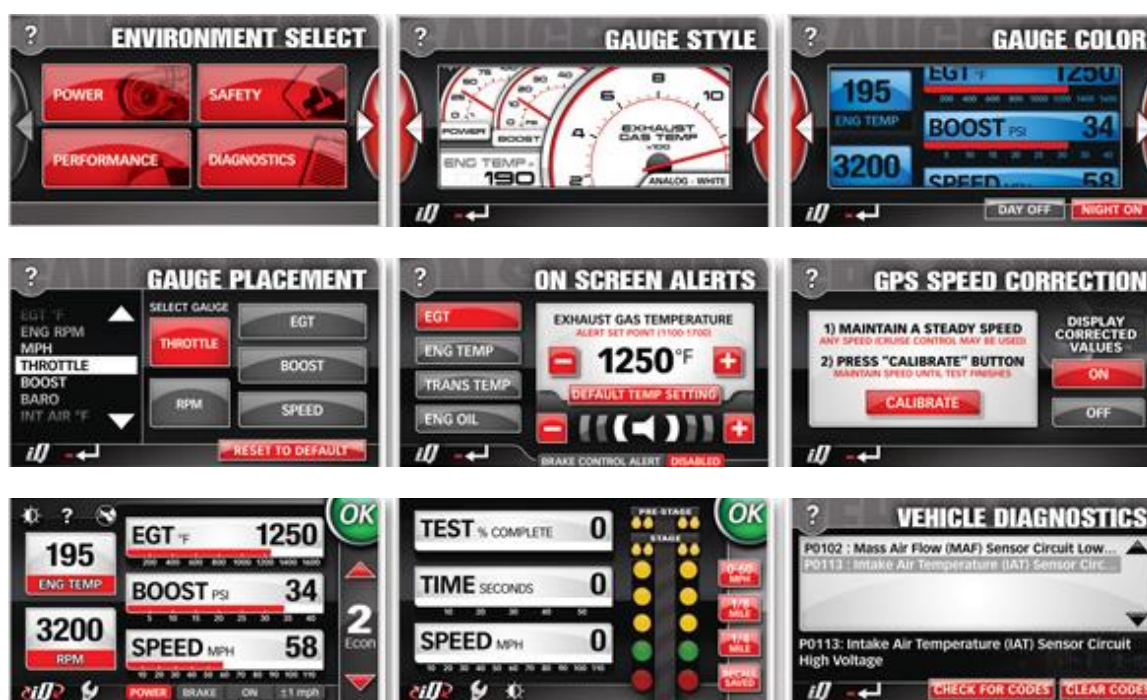
- Allows the user to know the inner workings of your vehicle's ECU and lets to what's beyond the dashboard gauges
- Adjusting power levels
- Controlling your downhill cruising speed
- Adjusting the braking intensity
- Custom tuning numerous performance parameters
- Measuring vehicle performance
- Reading your altitude
- GPS corrected speed
- Alerts when critical engine parameters raises beyond predefined boundary.
- Display OBD-2 codes and descriptions

In addition to these features, Banks iQ allows the user to work with applications like MS Office suite, Play Audio and Video, Play games etc. Moreover, critical persisted data are encrypted for enhanced security.

User Interface

Another salient feature of the Banks iQ is its attractive user interface which was developed using custom designed hi-performing graphics library. Our team members were involved in this design in their previous organization. This is especially designed to suit for hand held devices.

Following are some sample screen shots for the first version.



The software has day and night modes. Software can automatically switch to night mode if required. Night mode is carefully designed to reduce strain to eyes during a night drive. User has options to adjust the color of the UI to his/her preferences.

Communication with Vehicle

Banks iQ software communicates with the vehicle modules through USB interface. Banks iQ software has a communication layer which abstracts the type of communication from higher layers like UI and functionality. So, one can easily switch the underlying communication channel to Bluetooth, serial or any other technology easily.

3. Sustaining Engineering of Banks iQ application

Banks iQ is a very stable product with 1000's of installations in various vehicle makes. However, GBE is keen to provide enhanced features to it's customers on regular interval. They also introduce new peripherals as a result of their continuing R&D effort. Banks iQ software needs to be enhanced to accommodate the new peripherals as and when they are introduced.

In order to accomplish these tasks they entrusted Deep Thoughts with a product maintenance contract. Some of the feature enhancements we have done as part of this are the following.

- Control HMI for Water Methanol Injection Peripheral and Density Peripheral.
- Enhancements of iQ Update utility in Mac
- Feature enhancement of night mode

'Scrum' is chosen as the project management methodology and 2 weeks sprints are defined with a list of features to be accomplished. Daily standup meeting with the team in India and product owner in USA are carried out through the Internet. In addition to this, progress is tracked through weekly meetings also. A detailed time sheet submitted by us enables the client to see the time utilization and forms the basis of time and material based billing.

GBE requests our engineers at their site in USA periodically to assist them in testing the application. This is required because testing at offshore is done using simulators and it is not possible to have actual vehicles here.

4. Summary

GBE is benefited by having an experienced team handling the product maintenance activity. This reduces the effort from their part in specifying what enhancements to be done. As a long term contract, we have offered about 20% reduction in our engineering charges which are already competitive. This results in huge cost savings to GBE. For Deep Thoughts, there is an assured business from client and also a very good learning opportunity in the cutting edge automotive performance enhancement technologies. So this continues to work as a win-win partnership.

5. References

5.1. <http://www.bankspower.com/banksig>

This Case Study is published by:
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