

Embedded computer for navigation dashboard

Customer

Leading European system integrator and manufacturer of automotive components for Tier 1 automotive suppliers.

Product's Description

The final product is a vehicle computer which includes:

- An embedded 2DIN processor platform based on the MIPS architecture with a connected CD-ROM or DVD-ROM drive (depending on the production version) and an USB interface;
- A color 8-inch TFT LCD module and a front panel with control elements;
- A push-button module (mounted on the steering wheel) for quick access to voice control without diverting driver's attention.



The onboard multimedia computer helps perform the following tasks:

- GPS navigation

- Driving route calculation based on map information and promptly received data about the status of route segments; route navigation
- Allowance for time spent in traffic along the route, taking into account special features (a trailer or a trunk on the vehicle's roof)
- Climate control system management
- Prediction of the vehicle's trajectory in reverse gear
- Personal address book management
- Use of points of interest (POI) with the possibility of search, summary display, filtering, updating and creation of user points
- Logging the vehicle's movement along the route (tachograph)
- Blocking the product's interface when trying to control it while driving (Speedlock)
- Multi-language support
- Support for AM/FM/XM/DAB radio broadcasting
- Music playback from CDs, USB storage devices and iPods
- MP3 and WMA audio support
- Multi-language voice navigation control, radio and music playback.

Solution

1. Software

The Promwad Innovation Company was part of the software development process and was responsible for general integration of a number of the product's new functions, software testing and error correction in a previously written code.

2. Key Tasks

Integration of previously developed software modules from other projects into a single new version application. Improvement of the API interface between integrated modules.

Addition of multimedia and navigation voice control support (using low-level libraries provided by the customer).

Implementation of the concept of storing map and language information on hot-swap SD cards. SD card reader integration.

USB integration (USB flash, connecting an iPod with control function support).

Support for a product line in different price ranges. Blocking a number of functions for mid-range models (voice control, etc.).

Correction of a large number of software implementation errors affecting the product's functions, such as navigation (route guidance), destination selection and saving and voice control.

Three-level testing and quality assurance: testing at Promwad and two-level testing by the customer of each implemented function or corrected software error.

Product's Advantages

- Modular software architecture:
 - Flexible setup of design styles which differ in functionality
 - When designing future generations of the product, only selected modules will be subject to change
- Software implementation abstracting from the hardware platform features, which helps make a transition to another platform without changing the software
- A navigation module which is not tied to a specific geographic location; flexible mapping information control.

Technologies	GPS
Programming languages	C++
Development tools	MinGW, Eclipse
Project management tools	Bugzilla
