

# Making cars more intelligent



## MOST connection for infotainment systems

### Customer:

Funkwerk AG in Dabendorf

### Brief

Previous CAN-based solutions for **hands-free talking** and **voice recognition** were to be connected to a **MOST® bus**. In addition, an **MP3 player** would replace the CD changer. The aim is to produce a prototype for each that replicates the functionality of the original device in a vehicle manufacturer's **infotainment system**.

### Solution

In order to create a prototype rapidly as requested, an existing hardware design for the MOST connection and **standard MOST stacks** were used.

In an initial step, the **OS8104 MOST controller** was connected to the specified microcontroller.

The second solution is based on the BlackFin **BF539** made by Analog Devices, which already features an integrated MOST controller.

To avoid in-vehicle testing, a **lab setup of the infotainment system** was built. Here the behaviour of the vehicle manufacturer's **infotainment devices** was **analysed** and implemented accordingly for the target platform.

**Nucleus** was used as the operating system which includes drivers for USB, for example.

Our tasks likewise included **hardware commissioning** and **software integration**.

### Technologies

MOST,  $\mu$ C programming (ARM7, BlackFin), SMSC NetServices, MOCEAN MOST Stack, Bluetooth (SAP, HF), MOST High Protocol (MHP) and MAMAC, Nucleus, USB

### Length of project

Approx. 3 man-years



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The aim of the project was to provide a MOST® connection between an existing hands-free and voice recognition solution and a vehicle manufacturer's infotainment system. During a second stage, a MOST MP3 player was realized.

Our job on the technical side was to connect the hardware and software for other modules to the MOST ring. We were also responsible for hardware commissioning and software integration on the newly built microcontroller platform.

The project began with an in-depth analysis of requirements, which included presenting detailed potential solutions to the customer based on MOST projects that had already been carried out.

The customer's objective was to be able to present a prototype at CeBIT, just a few months after starting the project.

During the concept phase for the hardware and software, feasibility was also checked on the basis of evaluation platforms and existing MOST expansion plans.

The microcontroller platform was specified by the customer (for the first solution an ARM7-based  $\mu$ C from STM; the MP3 player was based on the BF539 made by Analog Devices).

## Integration of two MOST stacks

What was particularly exciting about the two subprojects was the customer's intention of realizing two different MOST solutions and weighing up the advantages and disadvantages of both solutions.

As a result, the STM-based solution was built on hardware and software from SMSC (OS8104 and NetServices) while the BlackFin-based solution was realized entirely using software modules from MOCEAN. Because the BlackFin BF539 already features a MOST communication controller (MOCEAN IP), no external MOST chip was needed.

## Integration into the infotainment ring

The second challenge was to ensure the new prototypes function within a vehicle manufacturer's infotainment ring and that they work with the head unit.

In order to achieve this, we built a lab setup of the infotainment system and used it to analyse the MOST messages added to comply with the MOST specification. By implementing standard function blocks and replicating the enhanced functionality of the selected infotainment system, the head unit was able to recognize and use both devices – the hands-free unit and the MP3 player.

## Presentation of results

For both subprojects, the customer was able to exhibit demonstrators containing the new prototypes in time for CeBIT. It was possible to show that cost-effective MOST solutions are achievable in the area of hands-free talking and voice recognition.

The MOST MP3 player showcased innovation in another area, providing an alternative approach that uses MOCEAN and Analog Devices as suppliers for MOST solutions.