



Case Study

XCP-on-FlexRay at Audi

The Customer

Audi is one of the world's most successful carmakers in the premium segment. The brand's vehicles excite with their technological innovations, modern styling and high quality of workmanship. Electronics is one of Audi's core competencies.

The Challenge

Direct parameterization of several thousand ECU parameters via an AUTOSAR FlexRay stack

What was needed to optimally coordinate parameters of FlexRay ECUs in the next A8 generation was to provide ECU access via XCP-on-FlexRay and a high-performance measurement and calibration tool. One of Audi's requirements was AUTOSAR compatibility of the XCP embedded software module and maximum efficiency in transmitting data in the XCP slots of the FlexRay schedule.

The Solution

Customization and extension of CANape and XCP software components

Audi works with a single measurement, calibration and diagnostic tool (MCD tool) and uses the standardized XCP measurement and calibration protocol and the XCP transport layer for FlexRay to calibrate ECUs – centrally via a uniform interface and independent of the supplier – over the entire development process. To attain the required AUTOSAR compatibility, Vector also extended the XCP software module (XCP Slave). The MCD tool CANape (XCP Master) was also modified, and this let AUDI developers take advantage of dynamic bandwidth management for FlexRay.

The Advantages

A calibration tool and perfectly coordinated high-performance XCP software modules from a single source

In measuring and calibrating internal ECU parameters, Audi developers realize the following advantages:

- ▶ A perfectly coordinated solution with XCP Master CANape and XCP software modules from a single source
- ▶ XCP integration in the AUTOSAR model ⇒ minimal memory requirements, since communication is via the existing communication stack
- ▶ Mature software modules ⇒ low ROM and RAM memory requirements, high runtime efficiency
- ▶ Dynamic management of the FlexRay bandwidth ⇒ extremely efficient use of the limited number of XCP slots that are available
- ▶ Using XCP enables oversampling that is independent of the FlexRay cycle ⇒ even very dynamic signal characteristics can be acquired
- ▶ A single command is sufficient to configure multiple signals ⇒ significant acceleration of the measurement start

