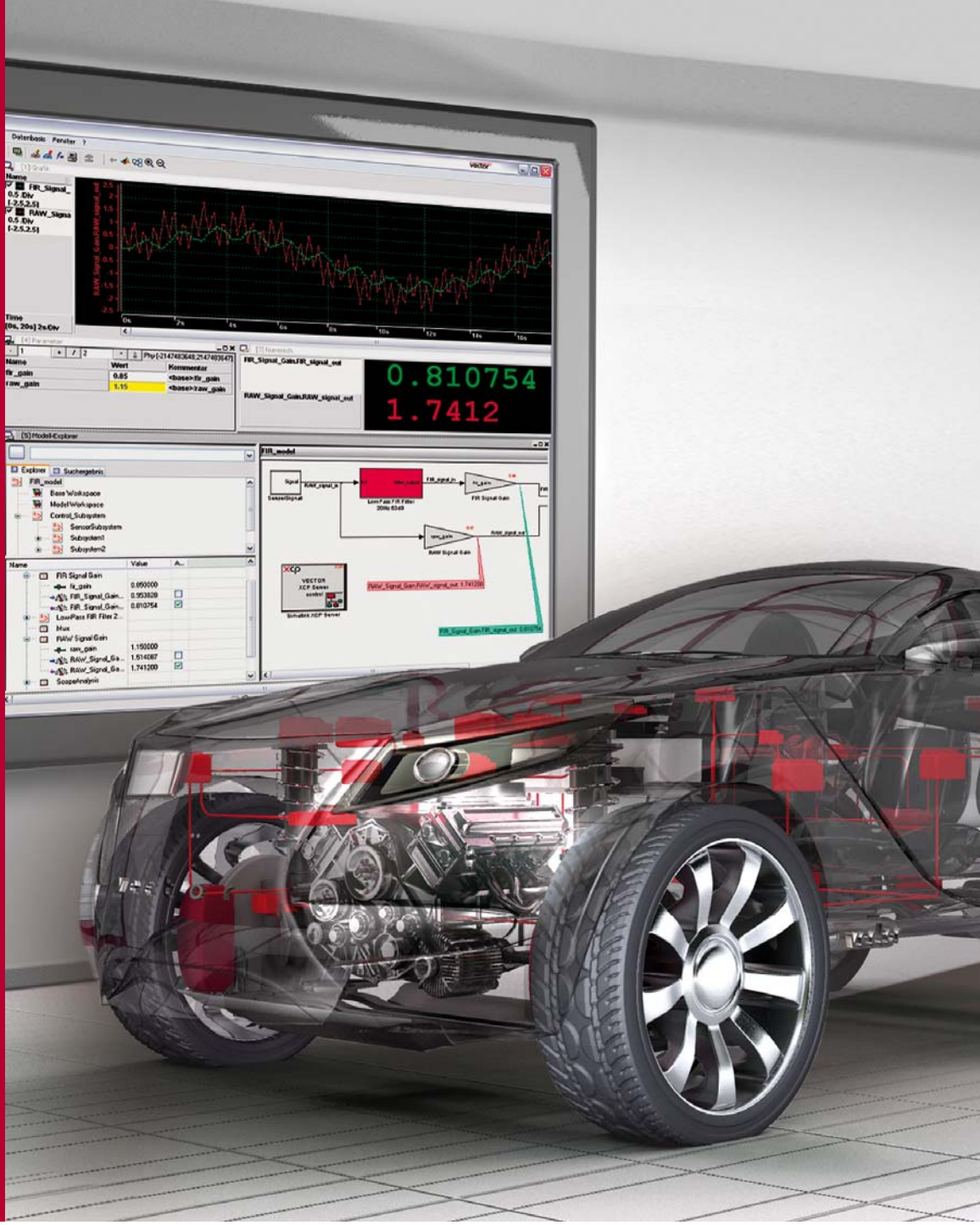

XCP on FlexRay with CANape
Version 1.0
2010-11-30

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1.0 Overview

When calibrating your FlexRay ECUs, you can rely on a high-performance, practice-proven solution whose components are perfectly coordinated. You can use:

- The XCP Master CANape to measure and calibrate internal ECU parameters efficiently and reliably.
- Tailor-made XCP software components for integration in the ECU and CANape, giving you maximum performance in measurement and calibration.

Ever since ASAM released the first specification of XCP on FlexRay in 2005, Vector has been supporting the universal measurement and calibration protocol in CANape.

2.0 Measurement & Calibration for FlexRay

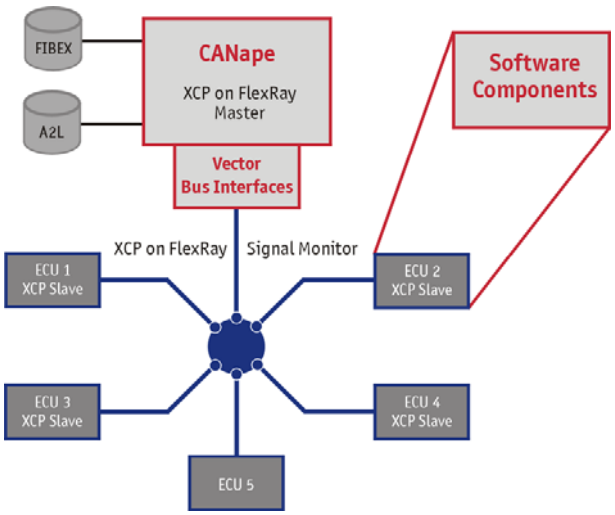
Beside signals from CAN und LIN CANape acquires FlexRay signals and displays them. As an XCP on FlexRay Master CANape measures and calibrates individual nodes directly over FlexRay. For the ASAM working group for standardization of XCP on FlexRay, Vector contributed fundamentals and continues to actively contribute its extensive XCP expertise. As a user you benefit from early implementation of the new standard in CANape.

2.1 Observation of the FlexRay Bus

CANape acquires FlexRay signals and displays them graphically. System descriptions in the latest FIBEX format are supported in this process. The effects of calibrating parameters in a FlexRay node are traceable and time-synchronous to all other measurement data (CAN, LIN, FlexRay and external measurement equipment). When calibrating via CCP or XCP on CAN the effects can be observed on the FlexRay bus.

2.2 Measuring and Calibrating Parameters on the FlexRay Bus

To access internal ECU parameters directly you need a special measurement and calibration protocol: XCP on FlexRay. CANape is the first MCD tool to have an XCP on FlexRay interface. It utilizes the universal, bus-independent XCP protocol layer, and all that is needed for FlexRay is a new transport layer. The XCP on FlexRay specification defines, especially for FlexRay, a method for dynamic allocation of the XCP-dedicated bandwidth. CANape utilizes this method to identify the bandwidth that is still available and to allocate it dynamically and very efficiently to the current application data traffic. The available bandwidth is thereby optimally utilized for XCP communication and does not affect normal FlexRay communication at all. As an XCP on FlexRay Master CANape lets you flexibly measure and calibrate FlexRay nodes.

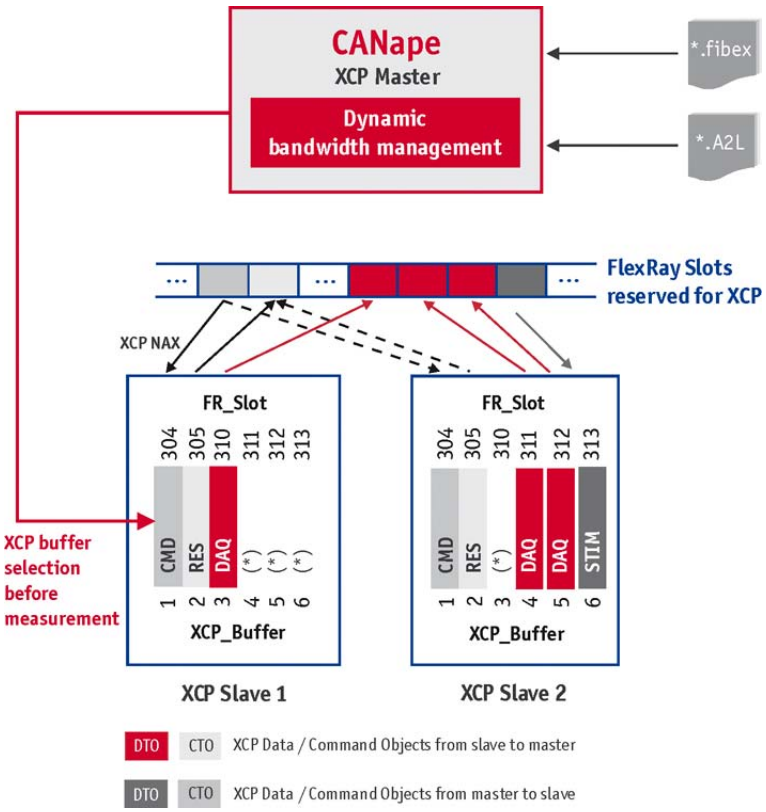


3.0 Dynamic FlexRay Bandwidth Distribution

The new function of the XCP Master assures the distribution of the available XCP slots over the slaves. The allocation of the FlexRay slots occurs automatically during runtime depending on the needs of the oncoming

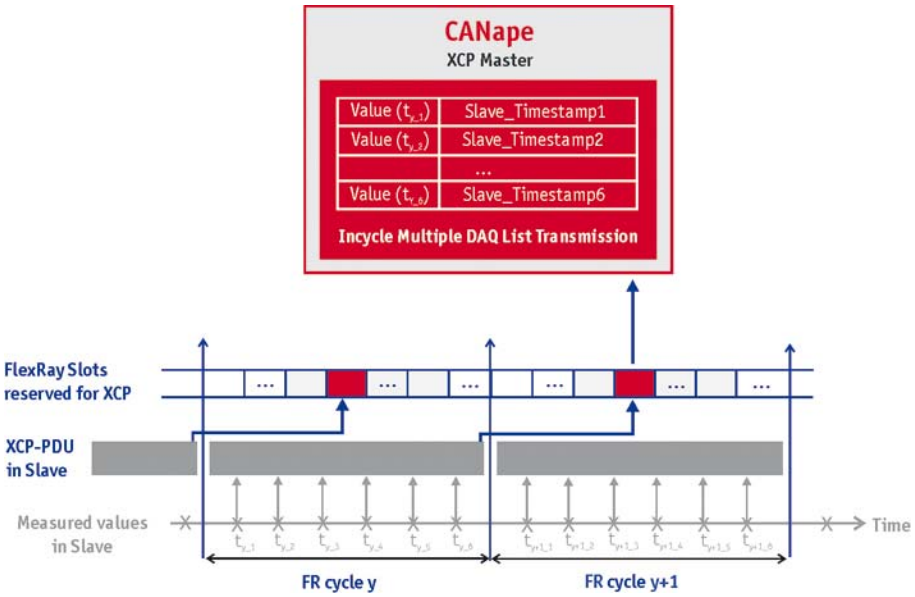
measurement. This functionality allows a faster transmission of the XCP data.

It can be realised on the slave side with the Vector XCP software modules combined with an AUTOSAR FlexRay Stack. As a precondition the integrator shall just assume that measurement and calibration requests are taken into account. No reconfiguration of the FlexRay driver and interface is necessary during runtime.



4.0 Incycle Multiple DAQ List Transmission

Signals might be measured by slaves at higher rates than the FlexRay basic cycle (mostly 5 msec) and transmitted to CANape with their corresponding timestamps for evaluation.



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