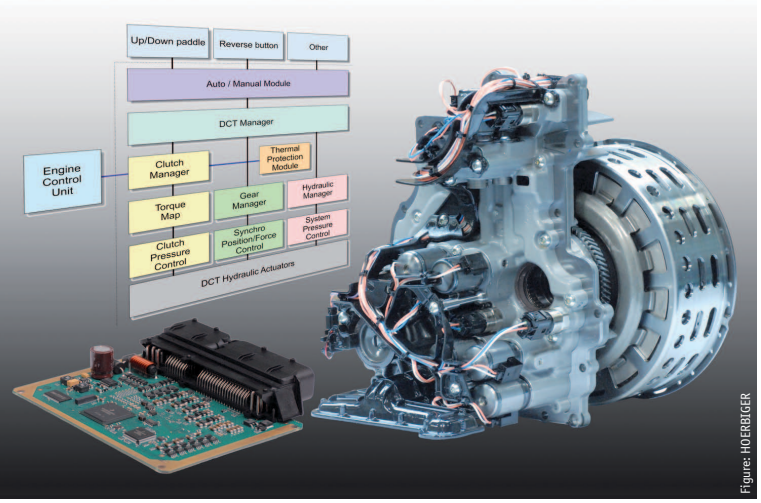


Figure: HOERBIGER

Case Study

Model-based development and ECU calibration with XCP and CANape

HOERBIGER

The Customer

HDM (HOERBIGER Drivetrain Mechatronics), a division of HOERBIGER Corporation, is a highly regarded clutch expert in the global automotive industry. It specializes in the development of dual-clutch mechatronic systems for sports cars, high-end sedans and heavy truck applications.

The Challenge

To conveniently test the behavior of Simulink models

In developing software for the second generation of a dual-clutch transmission, engineers convert the existing, manually written C code to MATLAB/Simulink models (Re-Engineering). The code is then automatically generated from the models and integrated directly in an AUTOSAR RTE. Each software module can be simulated in Simulink. However, existing MATLAB Scopes visualization options are inadequate in conducting detailed data analysis. The process of optimizing parameters is also time-consuming and rather inconvenient, requiring modification of values in the MATLAB Workspace or generation of specific GUI elements.

The Solution

CANape as a user interface for parameterizing and visualizing Simulink models and internal ECU data

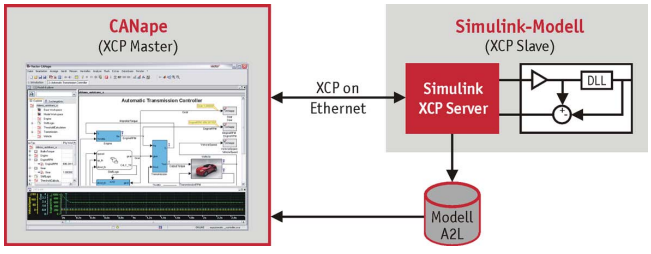
The simplest way to interface CANape with the model in Simulink is with the Simulink XCP Server. Users have the same options available here as in connecting to an ECU: drag & drop selection of measurement and calibration parameters from the description file and visualization in display and calibration windows. The necessary A2L description file is generated from the Simulink model at the press of a button; this enables read and write access to parameters in the model without requiring additional instrumentation of the model.

The Advantages

Simulink models can be visualized and parameterized conveniently and efficiently

The CANape Option Simulink XCP Server is ideally suited for analyzing model behavior:

- The standard XCP protocol enables use of the same CANape configuration over the entire development process. Regardless of whether the model, a rapid prototyping platform or the ECU is connected.
- To test the model as realistically as possible, logged measurement data can be fed into the model as input parameters at runtime.
- It is easy to visualize the measurement data and modify parameters in the various CANape windows. Object-specific model instrumentation is unnecessary.
- Calibration Data Management with CDM Studio makes it easy to edit and manage parameter set files in the model. Users can copy and merge different parameter sets, download to the Simulink model and save parameters in different formats, e.g. as an M-script in MATLAB format.
- Simulation results are available in MDF format. This enables direct comparison with measurement data from the vehicle and from the manual or automated evaluation in CANape.
- The solution is scalable: in simulations that are especially computationally intensive, processor loads can be distributed to 2 computers.



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