Offline Vehicle Calibrator Tool

Using MATLAB and Simulink
Offline Vehicle Calibrator Tool

Current Scenario

Includes iterative process of gathering and modifying ECU data
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Drawbacks

- Difficult to see the impact of one function on other functions
- Expensive
- Time consuming
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What is Offline Calibrator?

- A vehicle is conventionally calibrated by running the vehicle on test bench or running the vehicle on road. **This consumes more time & efforts.**

- In order to reduce the efforts & time, the test data are gathered at test benches (or road measurement) and analyzed in offline mode at desk using different application software.

- This requires a simulation environment which provides output as if a Vehicle (ECU-Electronic Controller Unit) would have provided for any given input.

- ECU contains the code which is generated from SIMULINK(R) models and “Offline Calibrator” utilizes the same SIMULINK(R) model to generate the signals which would have come from an ECU in a vehicle.

- Calibration Engineers can use this tool to play around with different sets of data and go back to test bench or vehicle to verify the real impact.
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Offline Calibrator Architecture
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Offline Calibrator Work Flow

- Models/DLL/SIL
- Offline Engine
- Calibration Data
- Signal Analysis
- Optimizer
- Calibration
- Impact Analysis
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Offline Calibrator Tool Overview

Step 1: Load the SIMULINK\textsuperscript{(R)} Model to be run.
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Validator

Step 2: Validate all required Signals to be used in the Model.
Algorithm

Step 3: Define a set of algorithms through which calculated signal will be influenced.
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Simulation

Step 4: Run the model in automatic mode using PCT.
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Multiple tasks running in PCT

• The same model has to be run with different set of data.

• Each set of data is provided to the model simultaneously and they run in parallel using PCT.

• This optimizes the time and resource utilizations.

• Impact of changes in one particular module on other modules are analyzed quickly.
Analysis

Step 5: The simulated and measured signals are compared & analyzed statistically.
Step 6: All the simulated signals are recorded in a Report file & shared with OEMs.
RESULTS

- Fast Simulation of Behavior of Vehicle Functions
- Huge Data is Optimized quickly
- Lesser Measurements required at Car

Reduced Cost
Reduced Time
Reduced Effort
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Q & A

Thank You