

Abstract

Nowadays the complex functionalities of modern vehicles are realized by electronic control units (ECU) connected with each other via different vehicle buses. The resulting distributed system is hard to be designed and tested. Therefore in the automotive industry the exhaustive testing of components is indispensable from the early phase of the development process.

The AUTOSAR standard offers the methodology of describing a whole system, and the communication between control units. This description is based on standardized data models, and contains all information for the configuration of tools observing communication over the vehicle bus.

To test the proper operation of an ECU, the observation of the related communication signals is a basic requirement. For this purpose different communication devices and PC side software are available on the market. The disadvantages of these solutions – although they provide rich visualization and often simulation services – are that the structure of the frames traveling on the network (the format of the user relevant data delivered by them) needs to be described in a manufacturer and/or protocol specific way (like CAN DB or Fibex). It seems obvious to develop a solution that can use AUTOSAR models as a description of inter-ECU communication, without enforce using intermediate description methods.

The implemented Trace software offers a convenient way to visualize the frames, PDUs and signals participating in the communication between AUTOSAR based control units. The communication can be observed in a table and also in a graph view and selected signals can be displayed on custom indicators. The log recorded by the Trace can be saved into CSV files to support further processing. Statistical parameters can be also calculated and displayed by the tool.

The configuration of the implemented software includes frames, PDUs and signals. Parameters of communication channels to be used to connect to the vehicle bus network are also stored. The entire configuration description described by a data model. This model can be easily derived from AUTOSAR System Description models. The configuration process is supported by a wizard which helps the user to choose the required frames and their display settings.

The software is based on the open source Eclipse framework and related technologies.