



Case Study

Automatically Validating Gateway ECUs During Real Test Drives

The Customer

Dr. Ing. h.c. F. Porsche AG is one of the world's most successful sports car manufacturers. With its "Panamera" model, the Stuttgart-based company is the first to launch a production vehicle that takes the concept of a four-door Gran Turismo and unites it with classic sports car design.

The Challenge

Automatically validate the central Panamera gateway ECU during real test drives

On the Panamera, a total of six CAN buses and several LIN buses are connected to a central gateway ECU for inter-network data exchange. To verify routing behavior, numerous tests in different driving situations and a detailed analysis are indispensable. In addition to previous laboratory tests with stimulation of the input signals, Porsche also wanted to verify gateway data traffic during real test drives and in stress scenarios in real-time.

The Solution

Automatically generate test module components with the Porsche Real-Time TRace Analyzer (PETRA)

The PETRA tool, developed by Vector, is based on CANoe and generates automatic gateway tests from routing tables. They can be used on test drives and in off-line evaluations, and they simultaneously evaluate the routing and copying behavior of messages on multiple buses. Filter options not only let users check all messages; they can also check all routing relationships and can hide exceptional situations such as network starts or bus ramp-down.

The Advantages

Detect errors early during gateway ECU development and increase maturity level

- ▶ PETRA seamlessly covers copying rule violations on the byte and bit levels and delivers a time advantage of about 65 % in the analysis of communication data. Developers can flexibly create automatic test sequences with the CAPL script language.
- ▶ In offline tests, it is possible to directly jump to the point in the trace data at which the error occurred.
- ▶ The test report is fully customized for Porsche-specific processes and terminology.
- ▶ Low training effort, even for users who are not familiar with CANoe.
- ▶ Error statistics offer detailed findings on the frequency and quality of errors.
- ▶ The PETRA approach is equipped for the future and can easily be transferred to future vehicle generations.
- ▶ Users can specify evaluation limits such as cycle time monitoring tolerances and allowable gate times.
- ▶ As a stand-alone tool, PETRA lets users create test configurations without an installed CANoe license.

