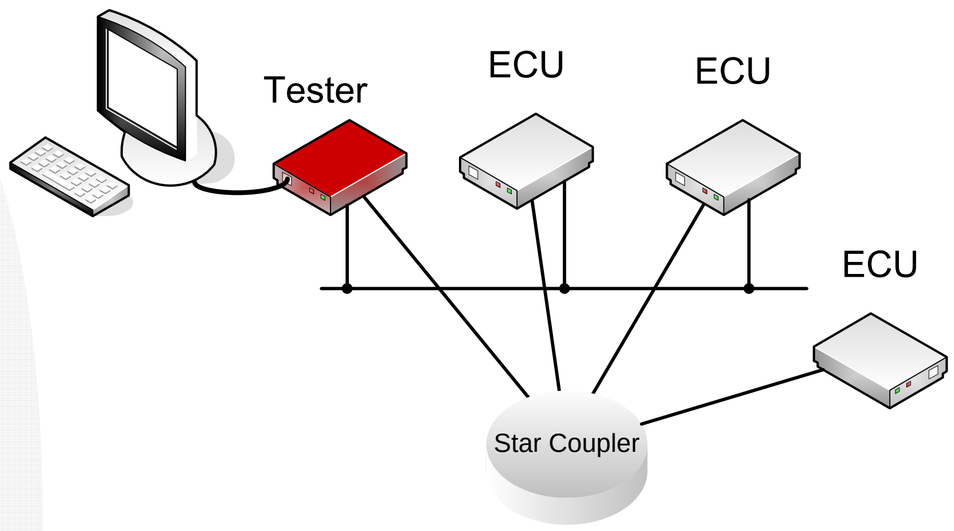
A Test Tool for FlexRay based Embedded Systems

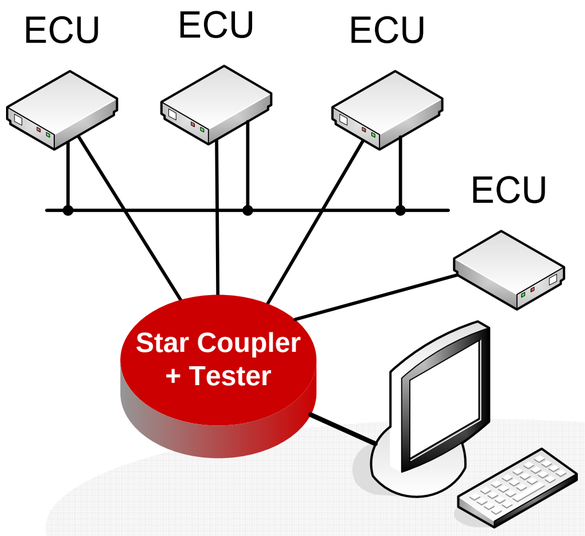
Project Aim: Development of a platform for the Test & Diagnosis of FlexRay based networks.

Conventional Test Setup (Node based Tester):

Temporal firewalls in FlexRay ease the testing process. In particular, they allow for a separate testing of the nodes (i.e. using standard node tests) and the communication subsystem in isolation. For the latter the standard approach couples a monitoring node to the FlexRay bus to record and analyze the bus traffic. Furthermore, the tester may inject disturbances into the bus traffic in order to study the cluster's behaviour.



Project DECS (Star Coupler based Tester):

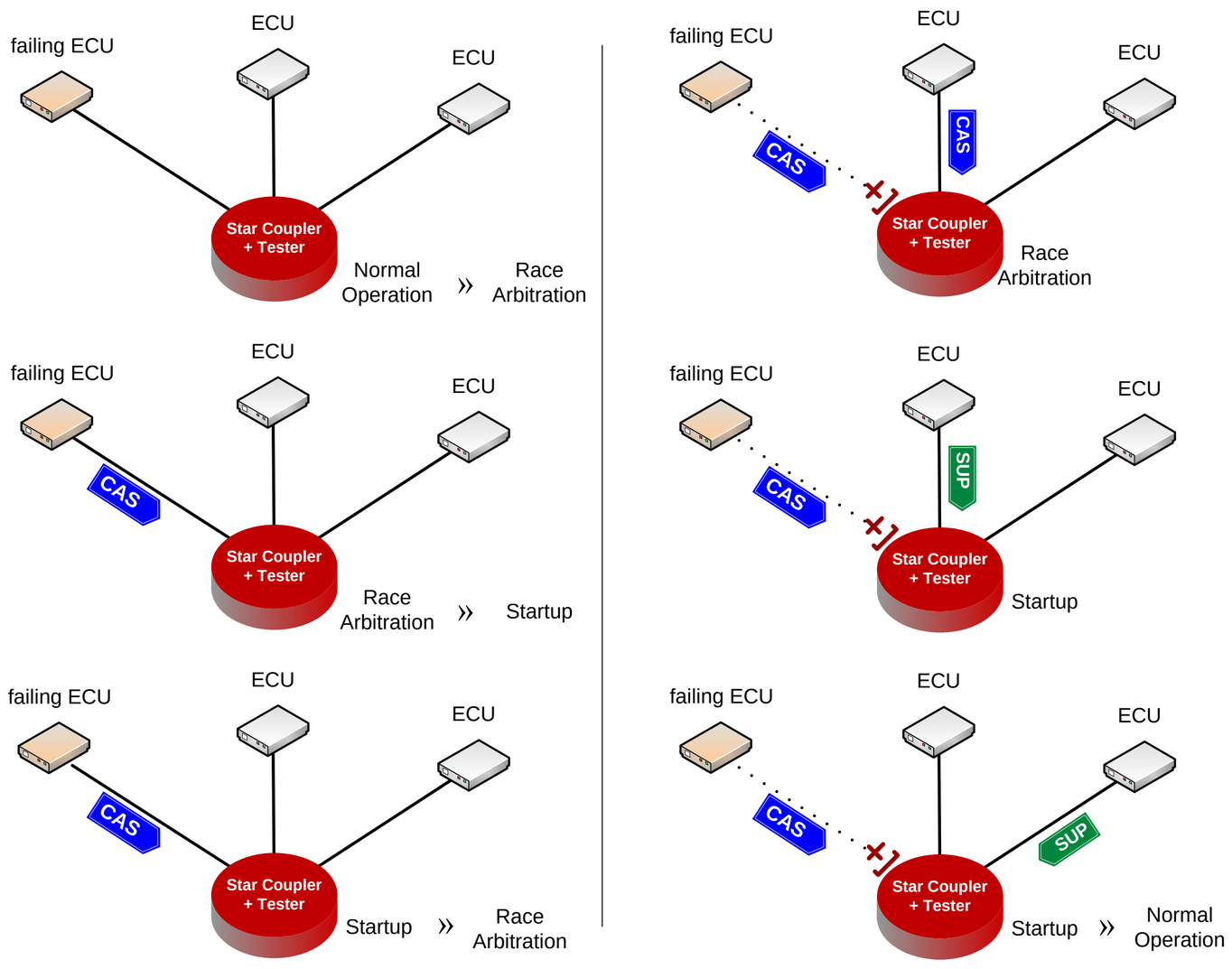


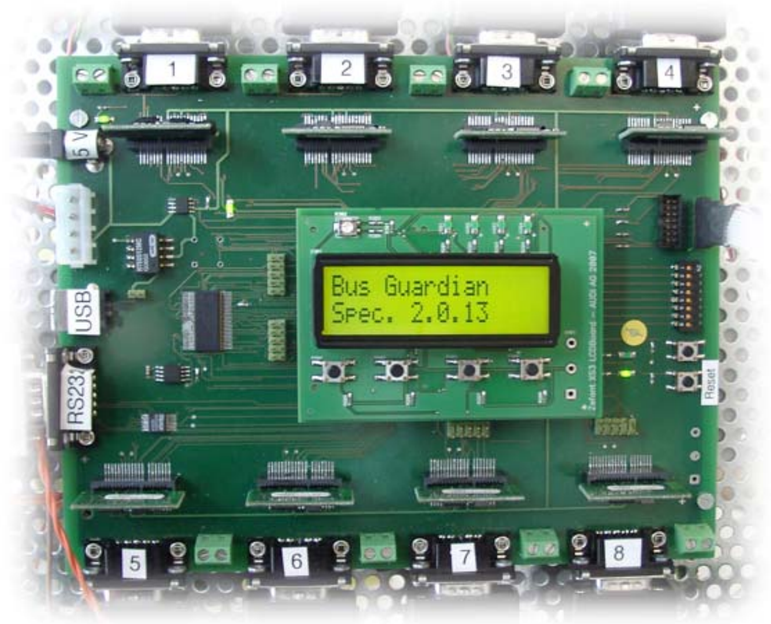
The approach in the DECS project is to integrate the tester − consisting of (i) bus monitoring, (ii) replay and (iii) fault injection functionality − with a star coupler. The embedded tester node is controlled by a host PC that uses a high-speed USB2.0 interface for control & data transfer.

The benefits of the star coupler based tester approach over the conventional node based tester approach are:

- *Replay can be performed synchronous and/or asynchronous to the FlexRay bus schedule without modifying the physical topology of the network.*
- *Complex failure modes can be evaluated more easily, e.g., byzantine failures or omission failures.*

Experiments: Start-Up Evaluation of a Central Bus Guardian with a babbling idiot emitting multiple CAS symbols





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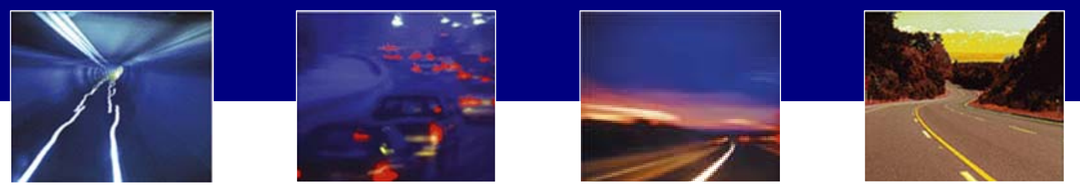

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