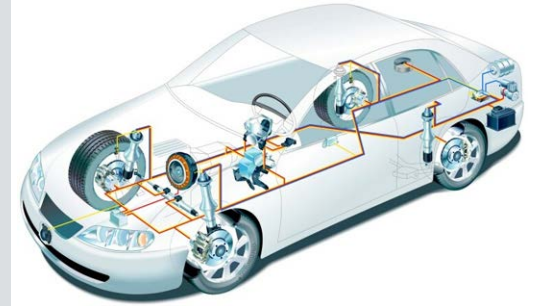


# Integration of Virtual Hardware Prototypes in CANoe

## Case Study Fraunhofer Institute for Integrated Circuits (IIS)



### The Customer

The Fraunhofer Institute for Integrated Circuits (IIS) is one of the most important German research institutes for the development of microelectronic systems and software. The scientists in the institute's department for Design Automation (EAS) in Dresden develop reliable methods and tools for designing complex electronic and mechatronic systems.

### The Challenge

**To master the complex design process for electronic systems in automotive technology.**

In developing electronic components for automotive technology, many very diverse partners must work together – from the semiconductor manufacturer to the TIER1 and finally the OEM. In this work, the specifications of individual components pose an especially large challenge: The system supplier must create its system specification according to these requirements, and it needs – for validation – a hardware prototype that is not always available at this point in time.

### The Solution

**Integration of virtual prototypes based on SystemC/SystemC-AMS in the CANoe platform**

SystemC/SystemC-AMS is a system modeling language that is widely used in the semiconductor industry, which makes it possible to create abstract models of a system's various hardware and software components. Because these models are abstract they can be simulated very quickly. Such models can be compiled and supplied to partners and customers without revealing internal know-how. The AutoSUN project supported by the German Federal Ministry of Education and Research demonstrates how models supplied by TIER1 or TIER2 suppliers can be integrated in the CANoe platform used at the OEM. This involves using the CAPL interface and implementing time synchronization between the SystemC-AMS simulation time axis and the CANoe time. For this purpose, the SystemC-AMS model is linked together with the synchronization library to form a DLL. This enables sharing of the model after compiling, which protects IP.

### The Advantages

**Component specifications without hardware prototypes**

- > Very early on testing with the ability to integrate in the system
- > Cost and time savings for hardware prototyping
- > Control of the virtual prototype using CANoe is identical to control of the real hardware
- > Connection of the virtual prototype with real hardware; for example, a virtual ECU can be connected to the bus system and tested early in the specification phase
- > IP-protected model exchange
- > Detection of concept or architecture problems

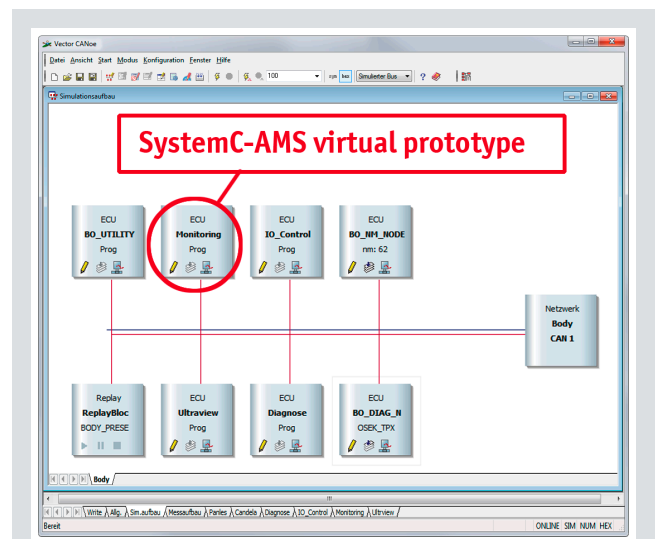


Figure: Exemplary simulation setup