Model Based Development of a Light Function for a Rapid Prototyping System

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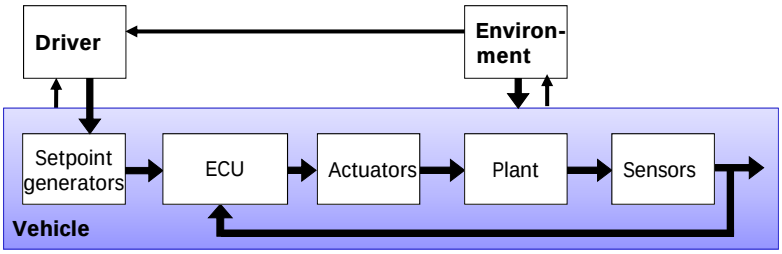
Model Based Development of a Light Function
Electronic Control Units

Today most functions in a car provided to the driver are electronically supported, i.e. the function is not only achieved by mechanical parts but combined with some electronics that allows more sophisticated solutions.

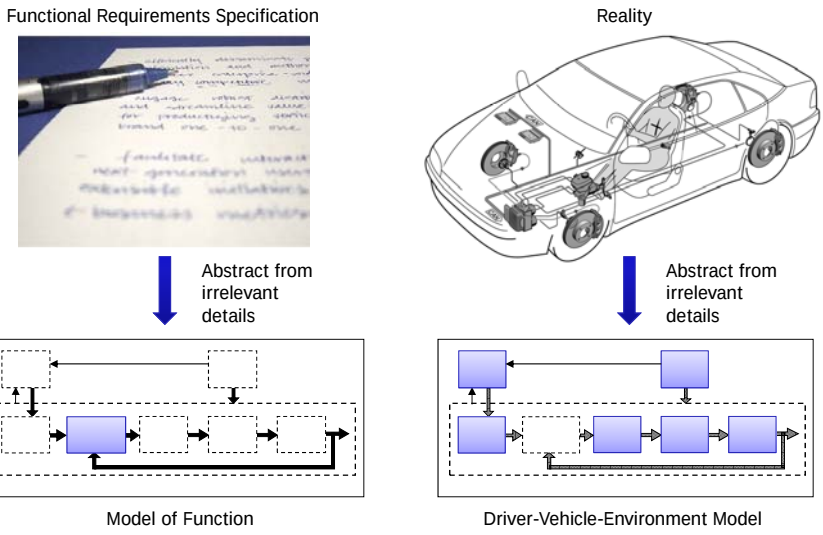
To support a mechanical function we need a computer system that is part of the technical process. Such a computer systems is called

Electronic Control Unit (ECU)

An electronic control unit comprises an **embedded system** because it is embedded in the technical process:



Model Based Development of a Light Function
Model Based Development



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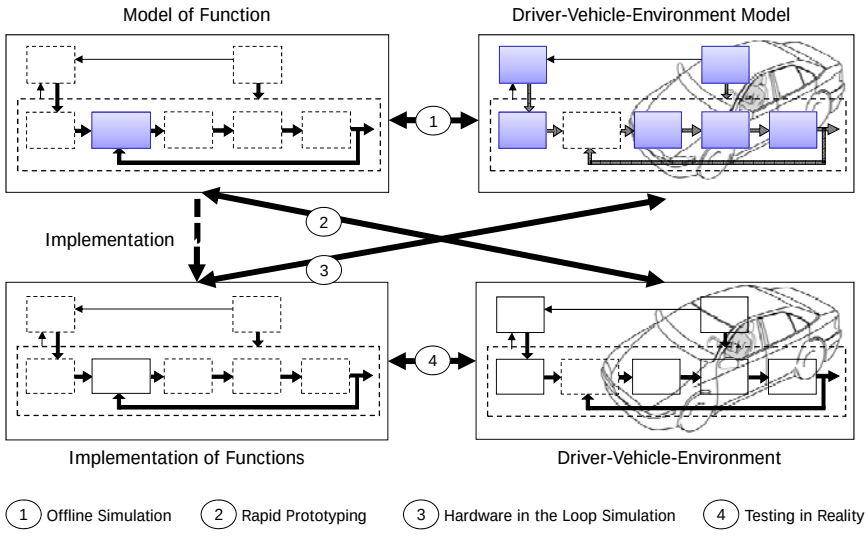
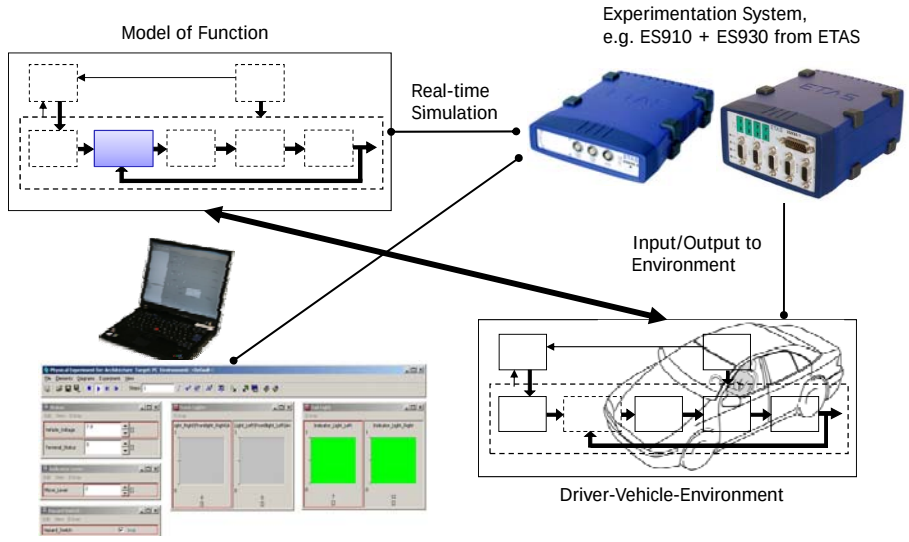


Model Based Development of a Light Function
Rapid Prototyping



Model Based Development of a Light Function
Rapid Prototyping

Real time prototyping on PC

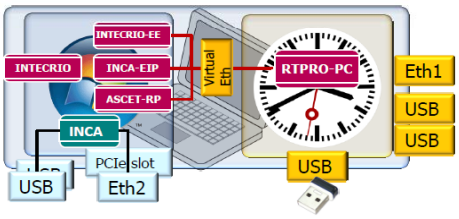
RTPRO-PC software turns a x86 based PC into a real time rapid prototyping target

- There‘s no need for a dedicated RP hardware
- The x86 platform gives a very powerful simulation node
- Windows can run on the same PC in parallel and at the same time
- Automotive I/O interfaces are provided via the PCs USB and Ethernet ports

Model Based Development of a Light Function
Rapid Prototyping

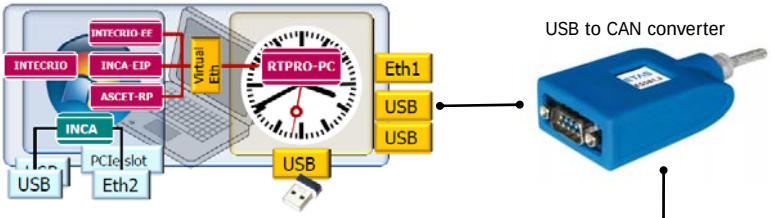
Real time prototyping on PC

- On boot time, RTPRO-PC assigns the available hardware (on a controller hardware level) either to windows or to the real time system
- The following hardware is assigned to the real time node
  - the built-in ethernet interface and
  - one USB controller (controlling 2 or more USB ports)
- Every other hardware is assigned to Windows
- Communication between Windows and the real time system takes place via virtual network interfaces
- A USB stick provides NVRAM the real time node



Model Based Development of a Light Function
Rapid Prototyping

Fullpass Experiment with CAN I/O



USB to CAN converter

Model car scale 1:18

CAN I/O modul MCM 200

ASCET Product Family

- Universal and flexible product family for function and software development for automotive embedded systems.
- **ASCET-MD:** Modeling, simulation and validation of embedded control functions. Supports automotive standards like OSEK and AUTOSAR.
- **ASCET-RP:** ASCET-RP enables rapid prototyping of software functions created in ASCET – both in the laboratory and in the vehicle. This enables early validation of functions in the real world.
- **ASCET-SE:** Certified automatic code generation for production ECUs.
  - Supports ASAM, OSEK, MISRA and IEC 61508 standards
  - Over 50 Mio. ECUs with automatically generated code on the road