

# FlexRay Fundamentals

<b>Duration:</b>	1 day
<b>Target group:</b>	Tool users and ECU developers
<b>Prerequisites:</b>	Basic understanding of bus systems

## 1 Introduction to FlexRay (1.0 h)

<b>Goal:</b>	Motivation for introducing a new bus system, familiarity with the FlexRay Consortium and its objectives, key differences between FlexRay and CAN
<b>Contents:</b>	Safety-critical systems in the automobile and their requirements, concepts of "reliability", "safety" and "fault tolerance", time-triggered and fault-tolerant data transmission

## 2 Physical topologies and signal transmission (1.0h)

<b>Goal:</b>	Gain familiarity with physical topologies and signal transmission
<b>Contents:</b>	FlexRay topologies, layout of FlexRay ECUs, signal representation and eye diagrams, termination and common mode rejection, coding and decoding

## 3 Synchronization (1.5 h)

<b>Goal:</b>	Learn about initial synchronization and resynchronization
<b>Contents:</b>	Wakeup, startup, coldstart node, synchronization process and time hierarchy, exercise

## 4 Communications structure and bus access (3.0 h)

<b>Goal:</b>	Build knowledge of FlexRay communication
<b>Contents:</b>	TDMA (Time Division Multiple Access), communication cycle, static and dynamic data transmission segment and network idle time, FlexRay frame, scheduling, key schedule and frame parameters, cycle multiplexing, exercises

## 5 Introduction to FIBEX (0.5 h)

<b>Goal:</b>	Learn about organization and description of FlexRay parameters in the FIBEX uniform exchange format
<b>Contents:</b>	ASAM Working Group, elements of a network description, describing signals, frames and ECUs in a FlexRay network

## 6 Questions, Suggestions, Requests

<b>Goal:</b>	Clarification of open issues and open discussion as feedback for Vector
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