
FLEXRAY V2.1

Ref : 004333A

Duration : 2 days

OBJECTIVES

- The course details the hardware implementation and describes the tests required to check the compliance of an equipment
- The communication scheme which enables both Time and event-triggered communications is explained
- The course focuses on error recovery mechanisms
- Implementation examples are described through Freescale and Philips existing devices

RELATED COURSES

- CAN bus (002601A)

PREREQUISITES

- Experience of a digital bus is mandatory

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Course also available
customized

Next sessions, see : <http://www.mvd-fpga.com/en/formationsCalend.html>

TOPICS**INTRODUCTION TO FLEXRAY**

- History, X-by-Wire
- Possible topologies
- Deterministic data transmission
- Partitioning
- Security mechanisms

COMMUNICATION SCHEME

- Time and event-triggered communications
- Synchronized time-bases on macrotick basis
- Time division, slot duration and slot number configuration
- FTDMA dynamic part of a communication cycle
- Mini-slot allocation
- Frame format
- Message oriented addressing via identifiers
- Symbol transmission

NODE ARCHITECTURE

- Bus controller
- SPI interface
- CPU parallel interface
- Node wake-up, power saving mode
- Media Access Control

TRANSFER PROTOCOL

- Fault-tolerant and time-triggered services
- Repetitive vs spontaneous message scheduling
- Dedicated online diagnosis services
- Redundant transmission channels
- Robust coding and bit recognition scheme

DOCUMENTATION

- Training manuals will be given to attendees during training in print.

PHYSICAL LAYER

- Error detection and signaling
- Fault confinement in the Time Domain, Bus Guardian
- Signal level and bit representation
- Transmission medium

LINK LAYER

- Fault confinement
- Error detection and signalling
- Message validation
- Message framing
- Scheduling and access control

TRANSPORT LAYER

- Status signalling
- Frame and data handling
- Frame filtering and masking

ERROR MANAGEMENT SERVICE

- Stopping communication
- Loss of synchronization
- Degradation concept
- Immediate passivation
- Error signaling

DEBUGGING A FLEXRAY APPLICATION

- Compliance checklists
- Physical layer testing
- Protocol conformance verification