



IA2 - FlexRay 2.1

This course covers the FlexRay specification version 2.1

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.

*A Lecroy analyser is used to capture and display FlexRay traffic.
-A lot of traces are included in the material.*

A more detailed course description is available on request at info@ac6-training.com

Prerequisites

- Experience of a digital bus is mandatory.

Plan

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 microtick 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

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 signalling

DEBUGGING A FLEXRAY APPLICATION

- Compliance checklists
- Physical layer testing
- Protocol conformance verification

Renseignements pratiques

Duration : 2 days
Cost : 1250 € HT



SARL au capital de 15400€ - SIRET 449 597 103 00026 - RCS Nanterre - NAF 722C - Centre de Formation : 19, rue Pierre Curie - 92400 Courbevoie
Siège social et administration : 21, rue Pierre Curie - 92400 Courbevoie - Tél. 01 41 16 80 10 - Fax. 01 41 16 07 78

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