

# ECU Tests with CANoe

## Agenda VectorAcademy

<b>Duration:</b>	3 Days, 21h
<b>Target Group:</b>	CANoe users in the test field
<b>Prerequisites:</b>	CANoe Environment and Programming concept
<b>Goal:</b>	Using CANoe as a testing tool, programming CAPL test modules, diagnostic features for ECU tests, Using measurement hardware, ECU memory access via XCP

**Pedagogical, technical and supervisory resources:**

- A course material is given to each trainee.
- Software tool CANoe for bus CAN simulation and test with real ECU
- The training sessions will be held in suitable rooms (meeting rooms)
- Trainer's competence: 15 years of experience in training related to embedded developments, network architectures.

**Method of follow-up of the trainee:**

A release sheet must be validated by the trainee. A first satisfaction questionnaire is planned at the end of the training.

### 1 | CANoe Quick Start

- > CANoe basics
- > Interaction Layer

### 2 | Introduction to CAPL Test Modules

- > CANoe Test Features overview
- > Test environment, test modules, test execution dialog
- > Test module configuration
- > Flow control, test groups, test cases, test steps
- > Test report generation
- > Execution options

### 3 | Programming CAPL Test Modules

- > Stimulation and wait points
- > Semi-automatic tests
- > Signal oriented tests
- > CANoe Interaction Layer manipulation for testing purposes
- > CAPL test functions for efficient test implementation
- > Constraints and conditions
- > Stimulus functions

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### 4 | Introduction to Diagnostics

- > Diagnostics and transport protocols
- > Configuration of diagnostic descriptions (CDD, ODX, ...)
- > Introduction to CANoe's Diagnostic Feature Set

### 5 | Using Diagnostic CAPL Functions

- > Diagnostic requests and diagnostic responses
- > Evaluation of diagnostic parameters
- > Using Seed & Key DLLs
- > Diagnostic tests with CAPL

### 6 | I/O Integration in CANoe

- > Motivation
- > Integration in CANoe

### 7 | Tests using measurement hardware

- > System variables
- > Using measurement and test hardware

### 8 | VT System Introduction

- > Motivation
- > Use cases
- > Integration in CANoe

### 9 | Setup

- > Power supply concepts, VT7001 and VTC8920, ground connections
- > Communication scenarios (VT System - CANoe)

### 10 | Measurement and Testing

- > VT1004 load module – concepts and features
- > Automatic tests for ECU outputs
- > Bus bar applications
- > VT2004 stimulation module - concepts and features
- > Automatic tests for sensor inputs

### 11 | Other VT Modules

- > Use cases

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- > Block diagrams and features

### 12 | Tests with XCP

- > Introduction XCP protocol
- > XCP configuration in CANoe
- > Measure ECU internal variables
- > ECU Tests with XCP