



# Release Presentation

**P2014-01\_AE\_MCD-1\_XCP\_BS+AS\_V1-3-0\_FVD**

**ASAM MCD1-MC V1.3**

Release Date: 2015 / 05 / 01

# Introduction

ASAM MCD-1 XCP defines a bus-independent, master-slave communication protocol to connect ECUs with calibration systems. XCP is short for Universal Measurement and Calibration Protocol. The primary purpose of XCP is to adjust internal parameters and acquire the current values of internal variables of an ECU. The first letter X in XCP shall express the fact that the protocol is designed for a variety of bus systems. The standard consists of a base standard, which describes memory-oriented protocol services without direct dependencies to specific bus systems. Several associate standards contain the transport layer definitions for CAN, FlexRay, Ethernet (UDP/IP and TCP/IP) and serial links (SPI and SCI).

## Introduction (contd.)

XCP accesses parameters and measurement variables in a memory address oriented way. The properties and memory addresses of this data are described in the A2L-file format, which is standardized through ASAM MCD-2 MC. The A2L-file contains all information to carry out such accesses and to correctly interpret the data that is transmitted via the XCP protocol. This means that access to a specific parameter or variable does not need to be hardcoded into the ECU application. In other words, the ECU just contains a generic XCP-protocol stack, which responds to memory access requests from the calibration system. Different calibration and measurement tasks can be performed by different configurations of the calibration system without recompiling and reprogramming the ECU application code.

## Introduction (contd.)

XCP was designed with two main objectives. The first is to impact the ECU resources, such as CPU load, RAM consumption and flash memory, for the XCP slave in a minimal way. The second is to achieve a maximal data transmission rate over the communication link and to reduce the impact on bus communication as much as possible. The standard also describes the organization of the ECU memory segments used by the ECU software. This allows memory-type specific access. Additionally, it describes the ECU interface for data read- and write access.

# Deliverables

- ▶ **Specification document**
  - New functionality included
  - Bug fixes included
  - Updated to newest format
- ▶ **AML Sources, A2L example files**
- ▶ **Seed&Key DLL Template**

# What's New?

## Overview

- ▶ **New: Multicast time correlation techniques using native XCP methods**  
This feature is intended to improve time correlation accuracy for XCP slaves being nodes of the same network (e.g. CAN).
- ▶ **New: Time correlation techniques by referring to external grand master clocks**  
The specification now defines handling of XCP slave timestamps in the case that the slave clock is synchronized to an external grand master clock (e.g. an XCP on Ethernet slave implementing IEEE 1588).
- ▶ **New: Bypassing consistency and error handling**  
The calibration tool is able to provide information to the XCP slave to realize data loss detection and appropriate reaction during bypass execution.
- ▶ **New: ECU state awareness for external slaves and calibration tool**  
This feature is intended to improve the calibration tool usability, i.e. to visualize which calibration interactions are not possible if e.g. an external slave is connected but the ECU is powered off.
- ▶ **New: XCP on Ethernet slave detection**

# Compatibility

- ▶ XCP V1.3 is compatible to XCP V1.2 with regard to the communication protocol.
- ▶ Each new feature is optional, an ECU may implement a subset.
- ▶ The AML declaration of the A2L XCP IF\_DATA description uses the data type `uint64` keyword of ASAP2 standard V1.7
- ▶ Calibration tools, which do not implement XCP V1.3, must use an A2L file compliant to XCP V1.2 or ignore the time correlation part of the XCP IF\_DATA section.