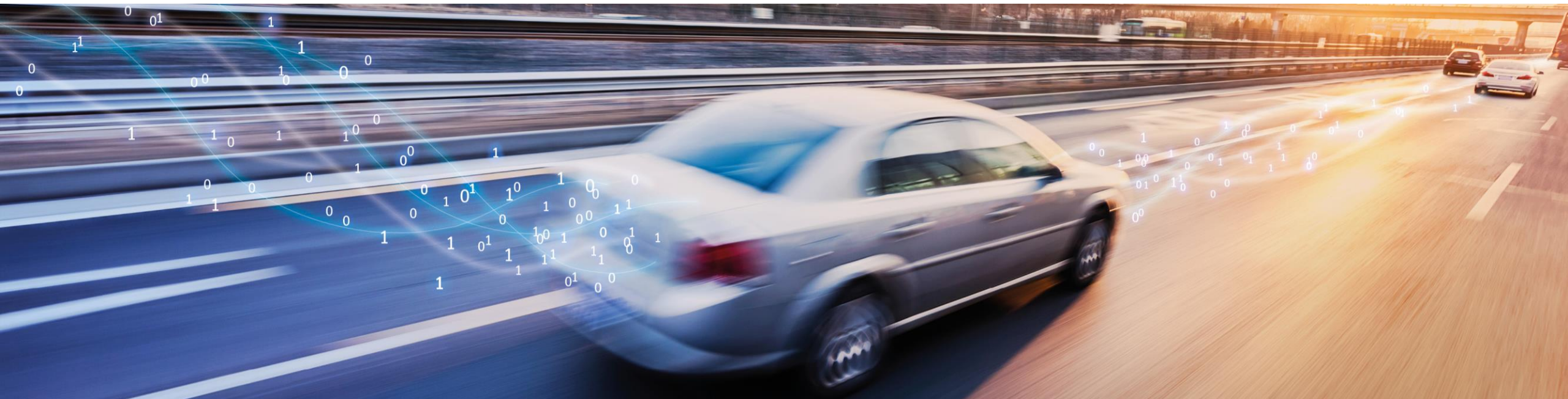


# ASAM AE MCD-1 XCP BS V1.5

## Release Presentation

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# 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).

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 – cont'd

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.

# Motivation

There is the new Software Debugging over XCP standard (ASAM AE MCD-1 XCP SW-Debug V1.0). This standard requires extensions to the XCP Protocol Layer.

# New Features

## Base Specification (Protocol Layer)

- **Definition of the XCP resource debugging (DBG)**
  - Chapter 4.7.2, 7.5.1.1
- **Added resource protection for XCP resource DBG**
  - Chapter 7.5.1.4
- **Definition of a command, error and event space for standard ASAM AE MCD-1 XCP SW-Debug V1.0**
  - Command space: chapter 7.4
  - Event space: chapter 7.2
  - Error space: chapter 7.6.3

# Other Changes

## Transport Layer

### XCP on CAN

- Chapter 7.1: usage of DAQ\_LIST\_CAN\_ID block and EVENT\_CAN\_ID\_LIST block described more precisely

## Seed & Key

Extension of the Seed & Key mechanism to also cover the new XCP resource DBG

# Backward Compatibility

- XCP V1.5 is compatible to XCP V1.4 with regard to the communication protocol
- Each new feature is optional, an ECU may implement a subset

# Relation to Other Standards

## ASAM AE MCD-1 POD BS V1.0.0

- Command space required by standard mentioned above is defined in ASAM AE MCD-1 XCP BS

## ASAM AE MCD-1 XCP AS SW-DBG-over-XCP V1.0.0

- The debugging resource required by standard mentioned above is defined in ASAM AE MCD-1 XCP BS
- Command, event and error space required by standard mentioned above is defined in ASAM AE MCD-1 XCP BS



# Deliverables

## Documents

- ASAM\_AE\_MCD-1-XCP\_AS\_Ethernet-Transport-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1-XCP\_AS\_Flexray-Transport-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1-XCP\_AS\_SxI-Transport-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1-XCP\_AS\_USB-Transport-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1-XCP\_BS\_Protocol-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1-XCP\_AS\_CAN-Transport-Layer\_V1-5-0.pdf
- ASAM\_AE\_MCD-1\_XCP\_BS\_2-2\_How-to-make-a-Seed-&-Key-DLL-for-XCP\_V1-5-0.pdf

# Deliverables – cont'd

## Supplementary Files

- XCP\_v1\_5\_common.aml
- XCP\_v1\_5\_definitions.aml
- XCP\_v1\_5\_on\_CAN.aml
- XCP\_v1\_5\_on\_FLX.aml
- XCP\_v1\_5\_on\_Sxl.aml
- XCP\_v1\_5\_on\_TCP\_IP.aml
- XCP\_v1\_5\_on\_UDP\_IP.aml
- XCP\_v1\_5\_on\_USB.aml
- XCPplus\_v1\_5.aml
- XCPplus\_v1\_5\_IF\_DATA\_example.aml
- XCP\_v1\_5\_example.a2l
- XCP\_v1\_5\_IF\_DATA\_example.a2l
- Callconv.h
- SeedNKeyXcp.dsp
- seedNKeyXcp.h
- seedNKeyXcpMain.cpp