ASAM AE MCD-1 XCP SW-Debug V1.0

Release Presentation

Dr.-Ing. Ralf König

Principal Software Engineer, Vector Informatik GmbH

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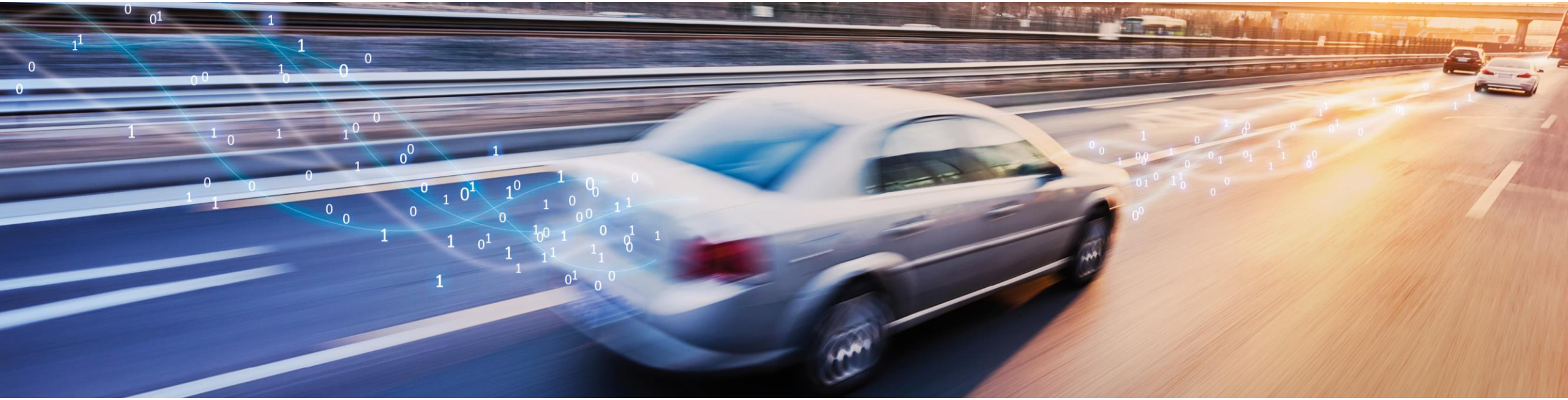


ASAM Association for Standardization of Automation and Measuring Systems

Introduction

Measurement data acquisition and calibration (MC) and software debugging (DBG) are essential techniques used during all stages of ECU development

- Techniques have typically been used apart in the past
- Demand of concurrent use in future

Today, only proprietary solutions exist

- These are performance limited and
- Do not cover all relevant use-cases requested by customers

As a consequence the standard *Software Debugging over XCP* has been developed

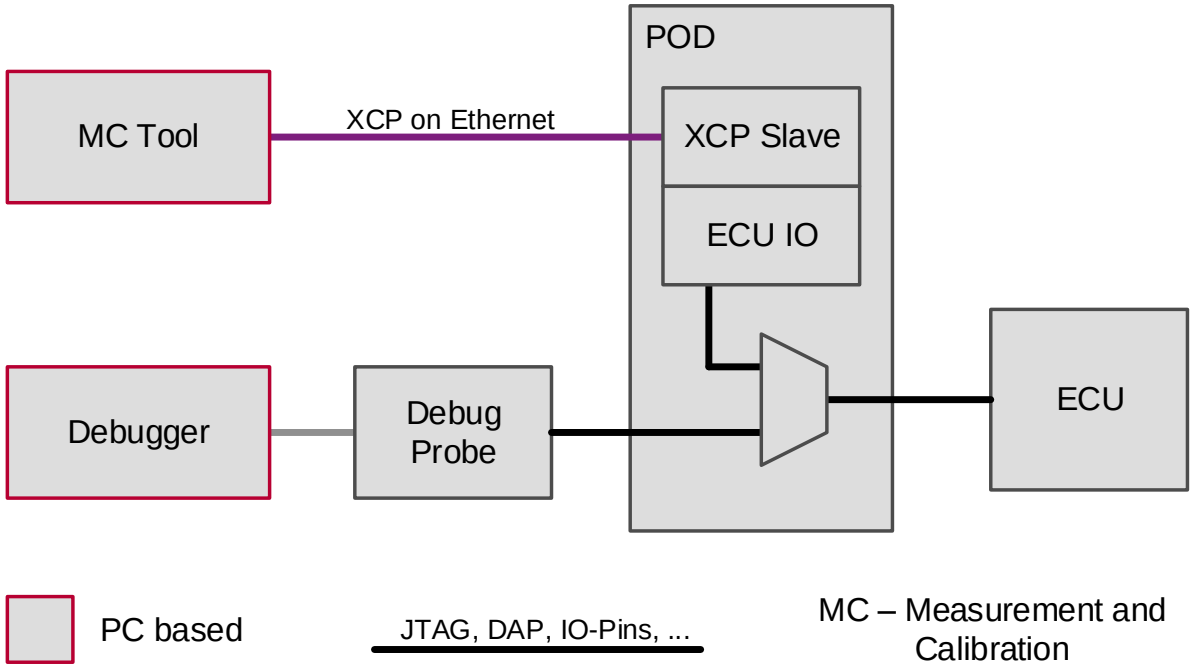
- Defining manufacturer-independent solutions to above mentioned limitations
- The mechanisms are XCP-based since XCP is well established and widely used in industry

Motivation

State of the art - switching of ECU debug signals

Limitations

- Hardware-based arbitration mechanisms lack semantical information of the arbitration request
  - Limits interoperability, system performance and usability
- When a Plug on Device (POD) is encapsulated within ECU housing the Debug Probe is unable to access the ECU

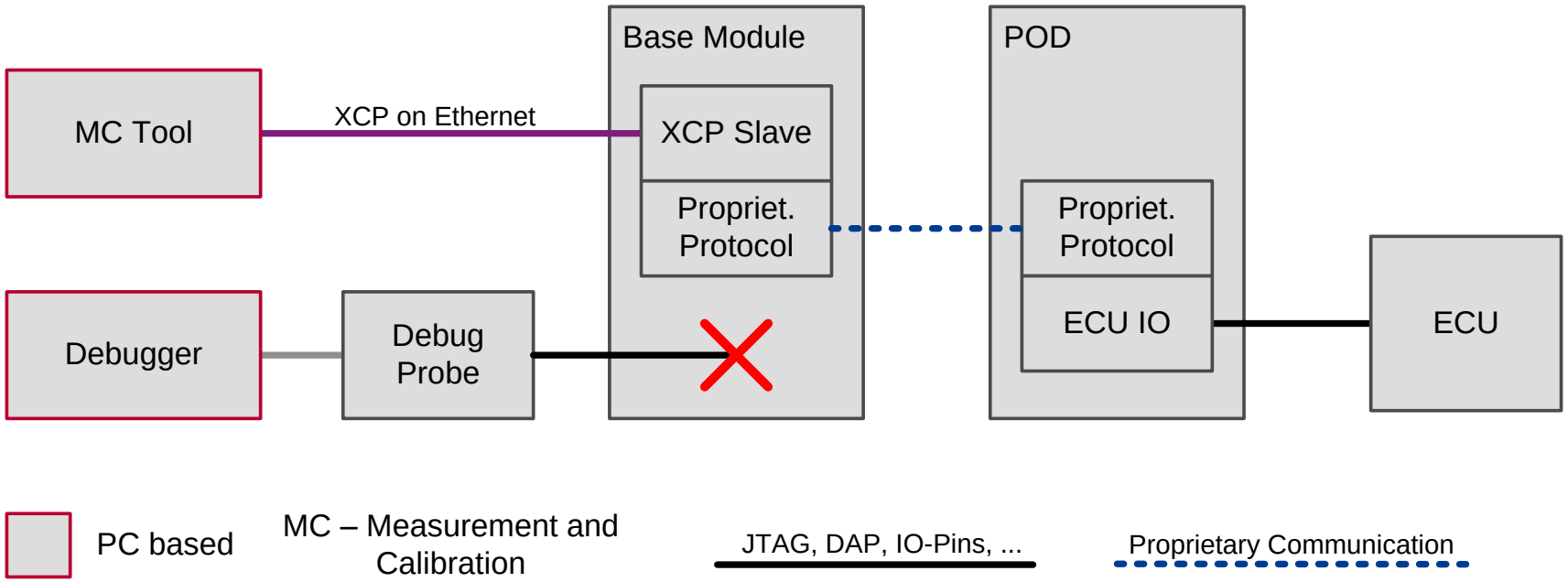


Motivation – cont'd

State of the art - partitioned measurement and calibration system

Limitations

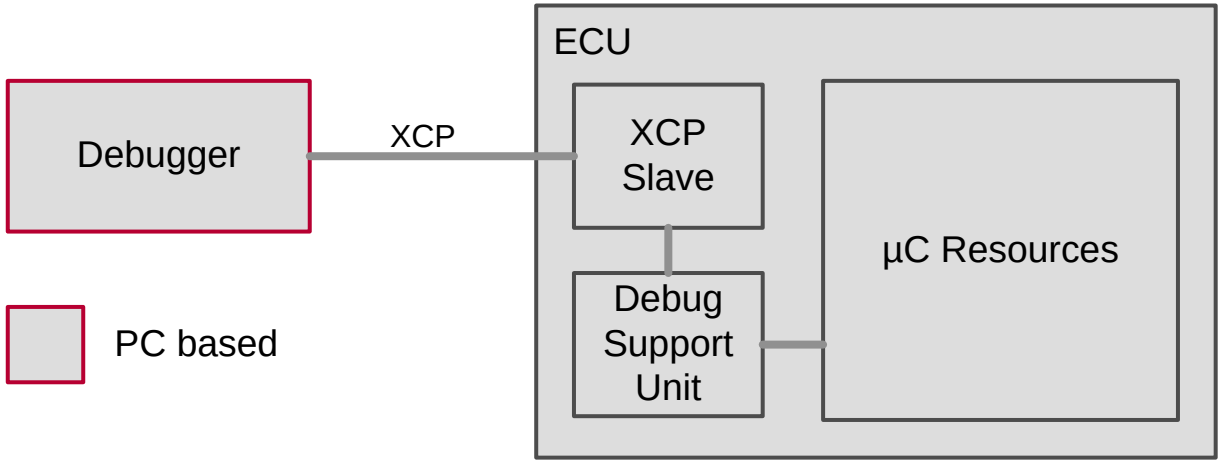
- Proprietary protocols used for communication between Base Module and POD prevent relay of Debug Probe signals



Motivation – cont'd

Development of manufacturer-independent mechanisms addressing todays and future needs of ECU debugging

- Extension of the widely used Universal Measurement and Calibration Protocol
  - By means of the new ASAM standard *Software Debugging over XCP*, associated to XCP
- Definition of generic mechanisms
  - Extending the range of applicable POD systems
  - Applicable to embedded XCP slaves, even those using Transport Layer CAN



New Features

First time introduction of Software Debugging within the scope of XCP

- Enables XCP based debugging of ECUs using PODs or embedded XCP slaves
- Reduces the need to switch between a POD and Debug Probe - which is a cumbersome task
- Enables debugging an ECU when the mechanical setup prevents accessing the ECU directly by a Debug Probe

Improving parallel use of MC and debugging

Definition of service levels

- Four service level exist
  - Service level 1 – Debugging not possible
  - Service level 2 – Exclusive debugger access to target
  - Service level 3 – High bandwidth assigned to debugger
  - Service level 4 – Low bandwidth assigned to debugger
- XCP slave determines the service level
- The debugger
  - shall adapt the feature set offered to the user according to the service level
  - shall adapt the XCP command sequence, e.g. shorten time span of exclusive target access
- The service level might change during run time
  - An event is sent to the debugger upon a service level change

New Features – cont’d

Improving parallel use of MC and debugging

Semantical awareness of debugger activities

- Debugger uses XCP commands rather than a primitive hardware arbitration mechanism
- POD can optimize scheduling of XCP commands from different XCP masters (MC, debugger) to improve system performance
  - When needed, the debugger can request exclusive target access

Handling of target resources

- There might be the need to share target ressources between MC and debugging
- Specification of protocol level methods for negotiation target resource between participants is much too complex
  - Same outcome as in the ASAM POD working group
- Adoption of ASAM POD approach for handling this use case
  - Integrator (Tier 1, OEM) has to take care of assigning target resources to the participants
    - Done at compile time
    - Integrator has to ensure that there are no resource conflicts

Other Changes

This is the first version of the standard. Thus, there are no points related to this this topic.

Backward Compatibility

Since this is the first version of the standard there are no issues related to backward compatibility.

Relation to Other Standards

ASAM MCD-1 XCP V1.5

- Definition of the new XCP-resource Debugging (DBG)
- Extended by a subcommand space for *Software Debugging over XCP*
- Extended by an XCP-event space for *Software Debugging over XCP*
- Extended by an XCP-error space for *Software Debugging over XCP*
- Extension of the Seed & Key mechanism to also cover the new XCP-resource DBG

Deliverables

Documents

- XCP Associated Standard: ASAM_AE_MCD-1-XCP_AS_SW-DBG-over-XCP_V1-0-0.pdf

Supplementary Files

- None