

MICROSAR DBG

Technical Reference

MICROSAR AMD

Version 1.0

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Document Information

History

Author	Date	Version	Remarks
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Reference Documents

No.	Source	Title	Version
[1]	AUTOSAR	AUTOSAR_SWS_Debugging.pdf	1.2.0
[2]	Vector Informatik	TechnicalReference_XCP_Protocol_Layer.pdf	see delivery
[3]	Vector Informatik	UserManual_AMD.pdf	see delivery



Caution

We have configured the programs in accordance with your specifications in the questionnaire. Whereas the programs do support other configurations than the one specified in your questionnaire, Vector's release of the programs delivered to your company is expressly restricted to the configuration you have specified in the questionnaire.



Caution

This symbol calls your attention to warnings.

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1 Component History

The component history gives an overview over the important milestones that are supported in the different versions of the component.

MICROSAR 4 Release Version	New Features
R7	First Version Supporting MICROSAR 4 Communication Stack BSW Modules

Table 1-1 Component history

2 Introduction

MICROSAR DBG (Debugging) provides access to BSW internal states for debugging purposes. Differing to the AUTOSAR specification ([1]), the widely used XCP protocol is used to fetch the values from the ECU.

For this purpose, BSW modules supporting the DBG functionality provide the required variable descriptions as an ASAM a2l file fragment or as part of the AUTOSAR data model (McSupportData) during the code generation process.

Due to the usage of XCP, the DBG module does not provide a dedicated implementation. MICROSAR DBG consists of this documentation and a license key that enables the generation of DBG data within the BSW module generators.

The benefit of using XCP as transport layer is that MICROSAR DBG can be used with existing XCP standard tools of the automotive industry such as CANoe.AMD or CANape. Additionally allows the XCP standard to perform conversion algorithms within the XCP tool and therefore does not require additional variables and code within the BSW module implementation.

MICROSAR BSW modules that support the generation of debugging (DBG) data can be identified by the supported feature “MICROSAR AMD Debugging” listed in the BSW modules technical reference.

Supported AUTOSAR Release	4	
Supported Configuration Variants:	n/a	
Vendor ID:	DBG_VENDOR_ID	n/a as no source code
Module ID:	DBG_MODULE_ID	n/a as no source code

2.1 XCP Tooling

As XCP is used to fetch the data a XCP tool is required to retrieve and illustrate the debugging data. MICROSAR DBG has been optimized for the usage with CANoe option AMD or CANape.

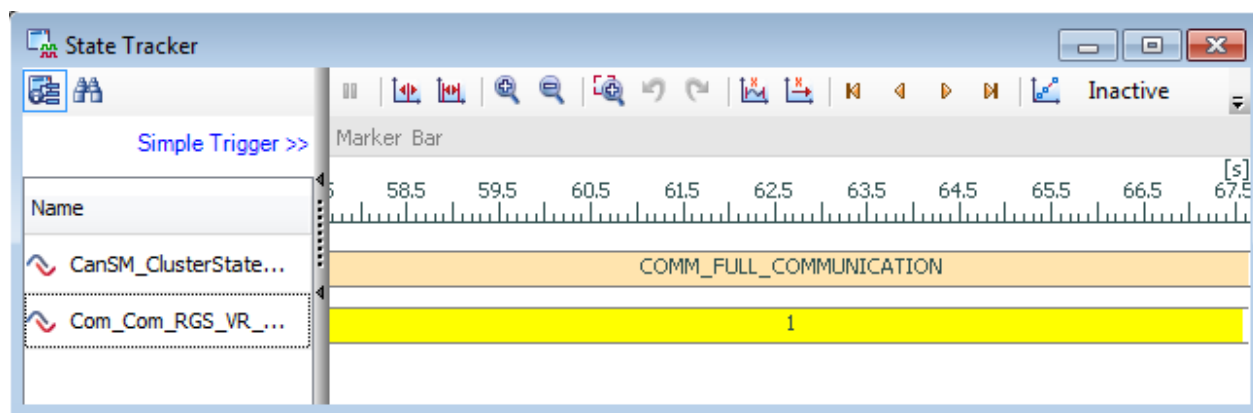


Figure 2-1 Example for DBG Data representation in CANoe.AMD

2.2 Architecture Overview

The following figure shows where the DBG is located in the AUTOSAR architecture.

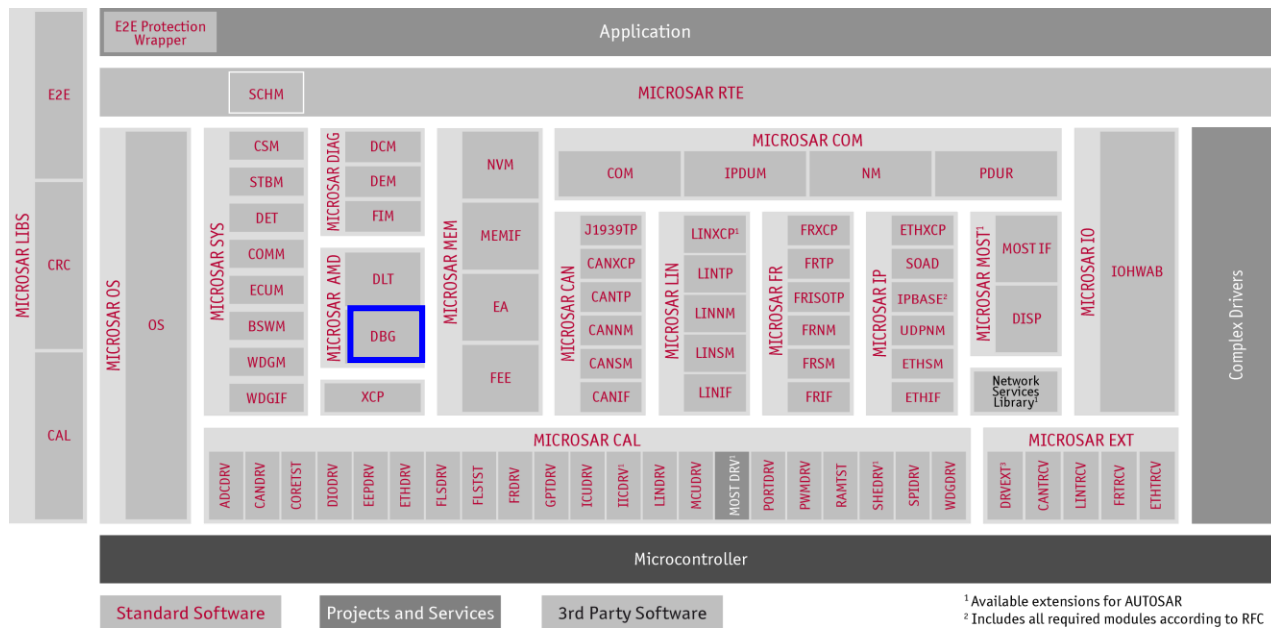


Figure 2-2 AUTOSAR 4.x architecture

3 Functional Description

3.1 Features

The features listed in the following tables cover the complete functionality specified for the DBG.

The AUTOSAR standard functionality is specified in [1], the corresponding features are listed in the tables

- > Table 3-1 Supported AUTOSAR standard conform features
- > Table 3-2 Not supported AUTOSAR standard conform features

Vector Informatik provides further DBG functionality beyond the AUTOSAR standard. The corresponding features are listed in the table

- > Table 3-3 Features provided beyond the AUTOSAR standard

The following features specified in [1] are supported:

Supported AUTOSAR Standard Conform Features
Access to BSW internal variables and constants for debugging purposes

Table 3-1 Supported AUTOSAR standard conform features

3.1.1 Deviations

The following features specified in [1] are not supported:

Not Supported AUTOSAR Standard Conform Features
Usage of the DBG protocol and ARXML structure as defined by AUTOSAR
MICROSAR DBG does not provide an implementation as bus communication is realized using XCP that accesses the debugging variables directly in memory.

Table 3-2 Not supported AUTOSAR standard conform features

3.1.2 Additions/ Extensions

The following features are provided beyond the AUTOSAR standard:

Features Provided Beyond The AUTOSAR Standard
Usage of XCP as communication interface using ASAM a2I file
Debugging data description provided as McSupportData (ARXML)

Table 3-3 Features provided beyond the AUTOSAR standard

4 Integration

This chapter gives necessary information for the integration of the MICROSAR DBG into an application environment of an ECU.

4.1 Scope of Delivery

The delivery of the DBG contains the files which are described in the chapters 4.1.1 and 4.1.2:

4.1.1 Static Files

File Name	Source Code Delivery	Object Code Delivery	Description
n/a			There are no static files delivered for DBG

Table 4-1 Static files

4.1.2 Dynamic Files

The dynamic files are generated by the DaVinci Configurator. There are no dynamic source code files.

File Name	Description
McData.a2l	ASAM a2l file fragment that provides the DBG measurement objects
McData_Event.a2l	ASAM a2l file fragment that provides the (optional) XCP event definitions to trigger a data transfer

Table 4-2 Generated files

The DBG a2l data is generated as a2l file fragments to the measurement and calibration data output folder \$(McDataFolder) of DaVinci Configurator. By default this folder is resolved as <ProjectRoot>\Config\McData.

These a2l files fragments need to be included in a master a2l. file before it can be loaded to an XCP tool. The master.a2l file provides additional information such as the XCP transport layer definition. MICROSAR XCP provides a Master a2l template file in the SIP: .\Misc\McData_Master.a2l.

Please see [2] for details on the XCP configuration and the AMD User Manual [3] for an overview on the overall workflow.

5 Configuration

MICROSAR DBG provides no own configuration options (or module) in DaVinci Configurator. In order to be able to generate a valid a2l file the DBG functionality requires the following parameters to be configured in the ECUC module:

- > /MICROSAR/EcuC/EcucPduCollection/PduIdTypeEnum
- > /MICROSAR/EcuC/EcucPduCollection/PduLengthTypeEnum
- > /MICROSAR/EcuC/EcucGeneral/SizeOfEnum

The parameters can be accessed through the “Basic Editor” of DaVinci Configurator which also provides an online help for each parameter in the “Properties” view.

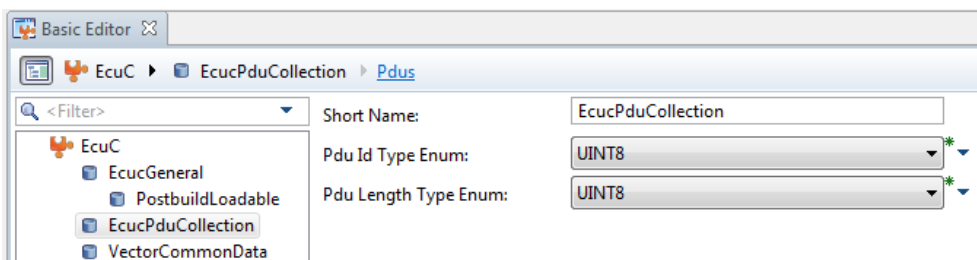


Figure 5-1 Configuration of Platform Settings in DaVinci Configurator (EcucPduCollection container)



Note

The above data is only required if some DBG data is exported that requires the availability of this information. If the data is undefined but required

5.1 Setting up CANoe for DBG

The AMD User Manual [3] provides some hints and examples how CANoe.AMD can be configured in order to illustrate DBG data.

6 Glossary and Abbreviations

6.1 Glossary

Term	Description
a2l	Exchange format defined by ASAM for measurement and calibration data
DaVinci Configurator	Configuration and Generation tool for MICROSAR 4

Table 6-1 Glossary

6.2 Abbreviations

Abbreviation	Description
AMD	AUTOSAR Measurement and Debugging
ASAM	Association for Standardisation of Automation and Measuring Systems
AUTOSAR	Automotive Open System Architecture
BSW	Basis Software
MICROSAR	Microcontroller Open System Architecture (the Vector AUTOSAR solution)
SWS	Software Specification
XCP	Universal Measurement and Calibration Protocol

Table 6-2 Abbreviations

7 Contact

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