

Document Title	Diagnostic Extract Template
Document Owner	AUTOSAR
Document Responsibility	AUTOSAR
Document Identification No	673

Document Status	published
Part of AUTOSAR Standard	Classic Platform
Part of Standard Release	R20-11

Document Change History			
Date	Release	Changed by	Description
2020-11-30	R20-11	AUTOSAR Release Management	<ul style="list-style-type: none">• Handling of Security Events• minor corrections / clarifications / editorial changes
2019-11-28	R19-11	AUTOSAR Release Management	<ul style="list-style-type: none">• Increase support for variant handling• Improved Dem upstream mapping• Support for custom service instances• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation• Changed Document Status from Final to published
2018-10-31	4.4.0	AUTOSAR Release Management	<ul style="list-style-type: none">• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
2017-12-08	4.3.1	AUTOSAR Release Management	<ul style="list-style-type: none">• minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
2016-11-30	4.3.0	AUTOSAR Release Management	<ul style="list-style-type: none">• Support for OBD• Support for J1939• Support for Fim configuration• Support for environmental conditions• Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation

2015-07-31	4.2.2	AUTOSAR Release Management	<ul style="list-style-type: none">Minor corrections / clarifications / editorial changes; For details please refer to the ChangeDocumentation
2014-10-31	4.2.1	AUTOSAR Release Management	<ul style="list-style-type: none">Initial Release

Disclaimer

This work (specification and/or software implementation) and the material contained in it, as released by AUTOSAR, is for the purpose of information only. AUTOSAR and the companies that have contributed to it shall not be liable for any use of the work.

The material contained in this work is protected by copyright and other types of intellectual property rights. The commercial exploitation of the material contained in this work requires a license to such intellectual property rights.

This work may be utilized or reproduced without any modification, in any form or by any means, for informational purposes only. For any other purpose, no part of the work may be utilized or reproduced, in any form or by any means, without permission in writing from the publisher.

The work has been developed for automotive applications only. It has neither been developed, nor tested for non-automotive applications.

The word AUTOSAR and the AUTOSAR logo are registered trademarks.

Table of Contents

1	Introduction	11
1.1	Overview	11
1.1.1	OEM	12
1.1.2	Application Developer	13
1.1.3	ECU-Supplier	13
1.1.4	Exchanging of Files	14
1.1.5	Relationship to software-component Service Needs	15
1.1.6	Recommendation and Hints	16
1.1.7	Limitations	16
1.2	Scope	17
1.3	Binding Times of Constraints	18
1.4	Abbreviations	19
1.5	Document Conventions	20
1.6	Requirements Tracing	23
2	Use Cases	27
2.1	Use cases for diagnostic data exchange	27
2.2	Configuration of DCM	27
2.3	Configuration of DEM	28
2.4	Configuration of the Fim	30
2.4.1	Model Function Inhibition	30
2.4.2	Model Fim configuration before Dem exists	31
2.5	Configuration of J1939 Diagnostics	32
2.5.1	Modeling of J1939 Diagnostic Aspects independent of the Deployment	32
2.5.2	J1939 Diagnostic Content modeled in the Diagnostic Extract	32
3	Conceptual Background	33
3.1	Definition of relevant Diagnostic Elements	33
3.2	Abstraction from EcuC Level	33
3.3	Independence of Definition	34
3.3.1	Use of <<atpSplittable>> enabling separation of elements over several physical files	34
3.3.2	Use of self-contained mapping elements	34
4	Common Meta Model Elements	35
4.1	Introduction	35
4.2	Data Identifier vs. Routine vs. Data Element	35
4.2.1	Usage of SwDataDefProps	42
4.2.2	Definition of Arrays	47
4.2.3	Definition of textual Strings	48
4.3	Textual Documentation	48
4.4	Diagnostic Contribution	52
4.5	Diagnostic Protocol	56

4.6	Diagnostic Common Properties	61
5	Diagnostic Services	67
5.1	Introduction	67
5.2	Service Instance vs. Service Class	67
5.3	Access Permission, Session, Security Level	70
5.3.1	Introduction to Access Permission	70
5.4	Environmental Conditions for the Execution of Diagnostic Services	75
5.4.1	Environmental Condition Formula	77
5.4.2	Atomic Conditions	79
5.4.2.1	Data Condition	80
5.4.2.2	Mode Condition	81
5.5	Diagnostic Services supported by AUTOSAR	84
5.5.1	DataByIdentifier	86
5.5.2	IOControl	91
5.5.3	EcuReset	95
5.5.4	ClearDiagnosticInformation	97
5.5.5	Memory Services	99
5.5.6	CommunicationControl	108
5.5.7	DynamicallyDefineDataIdentifier	113
5.5.8	ReadDataByPeriodicIdentifier	116
5.5.9	ControlDTCSetting	118
5.5.10	ResponseOnEvent	120
5.5.11	ReadDTCTInformation	124
5.5.12	RoutineControl	127
5.5.13	SecurityAccess	133
5.5.14	SessionControl	136
5.5.15	RequestFileTransfer	138
5.6	OBD Diagnostic Services supported by AUTOSAR	139
5.6.1	OBD Mode 0x01 (RequestCurrentPowertrainDiagnosticData)	142
5.6.2	OBD Mode 0x02 (RequestPowertrainFreezeFrameData)	143
5.6.3	OBD Mode 0x03 / 0x07 (RequestEmissionRelatedDiagnosticTroubleCodes)	145
5.6.4	OBD Mode 0x04 (ClearResetEmissionRelatedDiagnosticInformation)	146
5.6.5	OBD Mode 0x06 (RequestOnBoardMonitoringTestResults)	147
5.6.6	OBD Mode 0x08 (RequestControlOfOnBoardDevice)	149
5.6.7	OBD Mode 0x09 (RequestVehicleInformation)	151
5.6.8	OBD Mode 0x0A (RequestEmissionRelatedDiagnosticTroubleCodesPermanentStatus)	153
5.7	UDS Diagnostic Services for supporting WWH-OBD	155
5.8	Diagnostic Service Mapping	155
5.8.1	Diagnostic Service Data Mapping	159
5.8.2	Diagnostic Service Software Mapping	163
5.8.3	Security Event Reporting Mode Mapping	167
6	Diagnostic Event Handling	169

6.1	Introduction	169
6.2	DiagnosticEvent	169
6.2.1	Overview	169
6.2.2	Textual description	174
6.2.3	Associated Event Identification	177
6.3	DiagnosticTroubleCode	179
6.4	DiagnosticExtendedDataRecord	193
6.5	DiagnosticFreezeFrame	196
6.6	DiagnosticCondition	198
6.7	Diagnostic Debouncing	199
6.8	DiagnosticConditionGroup	204
6.9	DiagnosticMapping	206
6.9.1	DiagnosticEvent to DtcUds Mapping	207
6.9.2	DiagnosticEvent to DiagnosticOperationCycle Mapping	208
6.9.3	DiagnosticEvent to DebounceAlgorithm Mapping	209
6.9.4	DiagnosticEvent to EnableConditionGroup Mapping	210
6.9.5	DiagnosticEvent to StorageConditionGroup Mapping	211
6.9.6	DiagnosticEvent to Port Mapping	213
6.9.7	DiagnosticOperationCycle to Port Mapping	214
6.9.8	DiagnosticEnableCondition to Port Mapping	216
6.9.9	DiagnosticStorageCondition to Port Mapping	217
6.9.10	Provided Data Mapping	218
6.9.11	Master to Slave Event Mapping	221
6.9.12	Diagnostic Event to Security Event Mapping	222
6.10	DiagnosticOperationCycle	225
6.11	DiagnosticAging	226
6.12	DiagnosticIndicator	227
6.13	DiagnosticTestResult	228
6.14	OBD-related aspects of Dem Configuration	231
6.14.1	Dem Configuration for OBD-II	236
6.14.2	Dem Configuration for WWH-OBD	237
7	Functional Inhibition	239
7.1	Introduction	239
7.2	Alias Events	239
7.3	Function Identifier	240
7.4	Mapping between Inhibition Source and Diagnostic Event	241
7.5	Alias Event Mapping	241
7.6	Mapping of Function Identifiers to the corresponding Monitors	247
8	Diagnostics on J1939	250
8.1	Introduction	250
8.2	Suspect Parameter Number	250
8.3	J1939Dcm-related Modeling	251
8.4	Dem-related Modeling	251
8.5	Mapping between Software-Components and Controller Applications	255
8.6	Mapping between DiagnosticEvent and J1939 DTC	256

A	Mentioned Class Tables	258
B	History of Constraints and Specification Items	287
B.1	Constraint History of this Document according to AUTOSAR R4.2.1	287
B.1.1	Added Specification Items in R4.2.1	287
B.1.2	Added Constraints in R4.2.1	291
B.2	Constraint History of this Document according to AUTOSAR R4.2.2	293
B.2.1	Added Traceables in R4.2.2	293
B.2.2	Changed Traceables in R4.2.2	293
B.2.3	Deleted Traceables in R4.2.2	293
B.2.4	Added Constraints in R4.2.2	293
B.2.5	Changed Constraints in R4.2.2	293
B.2.6	Deleted Constraints in R4.2.2	293
B.3	Constraint History of this Document according to AUTOSAR R4.3.0	294
B.3.1	Added Traceables in R4.3.0	294
B.3.2	Changed Traceables in R4.3.0	295
B.3.3	Deleted Traceables in R4.3.0	296
B.3.4	Added Constraints in R4.3.0	296
B.3.5	Changed Constraints in R4.3.0	297
B.3.6	Deleted Constraints in R4.3.0	297
B.4	Constraint History of this Document according to AUTOSAR R4.3.1	297
B.4.1	Added Traceables in 4.3.1	297
B.4.2	Changed Traceables in 4.3.1	297
B.4.3	Deleted Traceables in 4.3.1	298
B.4.4	Added Constraints in 4.3.1	298
B.4.5	Changed Constraints in 4.3.1	298
B.4.6	Deleted Constraints in 4.3.1	298
B.5	Constraint History of this Document according to AUTOSAR R4.4.0	299
B.5.1	Added Traceables in 4.4.0	299
B.5.2	Changed Traceables in 4.4.0	299
B.5.3	Deleted Traceables in 4.4.0	299
B.5.4	Added Constraints in 4.4.0	299
B.5.5	Changed Constraints in 4.4.0	300
B.5.6	Deleted Constraints in 4.4.0	300
B.6	Constraint History of this Document according to AUTOSAR R19-11	301
B.6.1	Added Traceables in 19-11	301
B.6.2	Changed Traceables in 19-11	301
B.6.3	Deleted Traceables in 19-11	301
B.6.4	Added Constraints in 19-11	301
B.6.5	Changed Constraints in 19-11	302
B.6.6	Deleted Constraints in 19-11	302
B.7	Constraint History of this Document according to AUTOSAR R20-11	302
B.7.1	Added Traceables in R20-11	302
B.7.2	Changed Traceables in R20-11	302
B.7.3	Deleted Traceables in R20-11	303
B.7.4	Added Constraints in R20-11	303

B.7.5	Changed Constraints in R20-11	306
B.7.6	Deleted Constraints in R20-11	306
C	Glossary	306
D	Modeling of InstanceRef	310
D.1	Introduction	310
D.2	Modeling	311
E	Upstream Mapping	316
E.1	Introduction	316
E.2	Dcm	317
E.3	Dem	484
E.4	Fim	552
E.5	J1939 Dcm	556
E.6	IdsM	565
F	Splitable Elements in the Scope of this Document	567
G	Variation Points in the Scope of this Document	568

References

- [1] Specification of RTE Software
AUTOSAR_SWS_RTE
- [2] Layered Software Architecture
AUTOSAR_EXP_LayeredSoftwareArchitecture
- [3] Specification of ECU Configuration
AUTOSAR_TPS_ECUConfiguration
- [4] ASAM MCD 2D ODX
<http://www.asam.net>
ASAM MCD-2D ODX v2.2.0.pdf
- [5] XML Schema Production Rules
AUTOSAR_TPS_XMLSchemasProductionRules
- [6] System Template
AUTOSAR_TPS_SystemTemplate
- [7] Specification of ECU Configuration Parameters (XML)
AUTOSAR_MOD_ECUConfigurationParameters
- [8] Software Component Template
AUTOSAR_TPS_SoftwareComponentTemplate
- [9] Basic Software Module Description Template
AUTOSAR_TPS_BSWModuleDescriptionTemplate
- [10] Specification of Diagnostic Communication Manager
AUTOSAR_SWS_DiagnosticCommunicationManager
- [11] Specification of Diagnostic Event Manager
AUTOSAR_SWS_DiagnosticEventManager
- [12] Standardization Template
AUTOSAR_TPS_StandardizationTemplate
- [13] Requirements on Diagnostic Extract Template
AUTOSAR_RS_DiagnosticExtractTemplate
- [14] Specification of Function Inhibition Manager
AUTOSAR_SWS_FunctionInhibitionManager
- [15] SAE J1939 Top Level Document
- [16] Unified diagnostic services (UDS) – Part 1: Specification and requirements (Release 2006-12)
<http://www.iso.org>
- [17] Road vehicles – End-of-life activation of on-board pyrotechnic devices – Part 2: Communication requirements

<http://www.iso.org>

- [18] Road vehicles – Communication between vehicle and external equipment for emission-related diagnostic – Part 5: Emission-related diagnostic services.
<http://www.iso.org>
- [19] Road vehicles – Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements – Part 3: Common message dictionary
<http://www.iso.org>
- [20] Security Extract Template
AUTOSAR_TPS_SecurityExtractTemplate
- [21] Specification of Intrusion Detection System Manager
AUTOSAR_SWS_IntrusionDetectionSystemManager
- [22] SAE J1939-73 Application Layer – Diagnostics
- [23] Software Process Engineering Meta-Model Specification
<http://www.omg.org/spec/SPEM/2.0/>
- [24] Generic Structure Template
AUTOSAR_TPS_GenericStructureTemplate

1 Introduction

1.1 Overview

The distributed nature of an AUTOSAR ECU development requires an optimized capturing of information. In particular, diagnostic information (i.e. DEM and DCM configuration) shall be captured only once by the person with the best knowledge and therefore being able to take responsibility better than one centralized individual.

In the configuration approach before the advent of the [DiagnosticExtract](#), the Basic Software Modules DCM and DEM are entirely configured centrally. During integration, all SW-Cs above the RTE [1] (Application Software) introduce ports to be connected to the BSW modules [2]. Additionally, SW-Cs express needs which shall be fulfilled by the BSW.

The market shows a high demand for transferring diagnostic demands of the OEM-specific configuration process to their tier-1 suppliers.

In the past, due to the absence of integral options, many file formats like ODX or EcuC [3] are often used. But neither ODX nor EcuC is well suited to transfer this information.

For example, ODX [4] lacks in fault memory details and EcuC (which was never designed for becoming the vehicle for data exchange between different organizations) has a very generic nature that renders the enforcement of a strict model formalization very difficult.

On top of that, the integration of EcuC definitions into an existing configuration (especially the PDUs) cannot be fully automated.

Therefore, the obvious solution approach has been to define a new standardized AUTOSAR exchange format on diagnostic functionality that can be used similar to a System Description, formalized as an ARXML [5] file.

In this spirit, the configuration of diagnostic functionality becomes similar to the configuration of the communication part within the System Description [6].

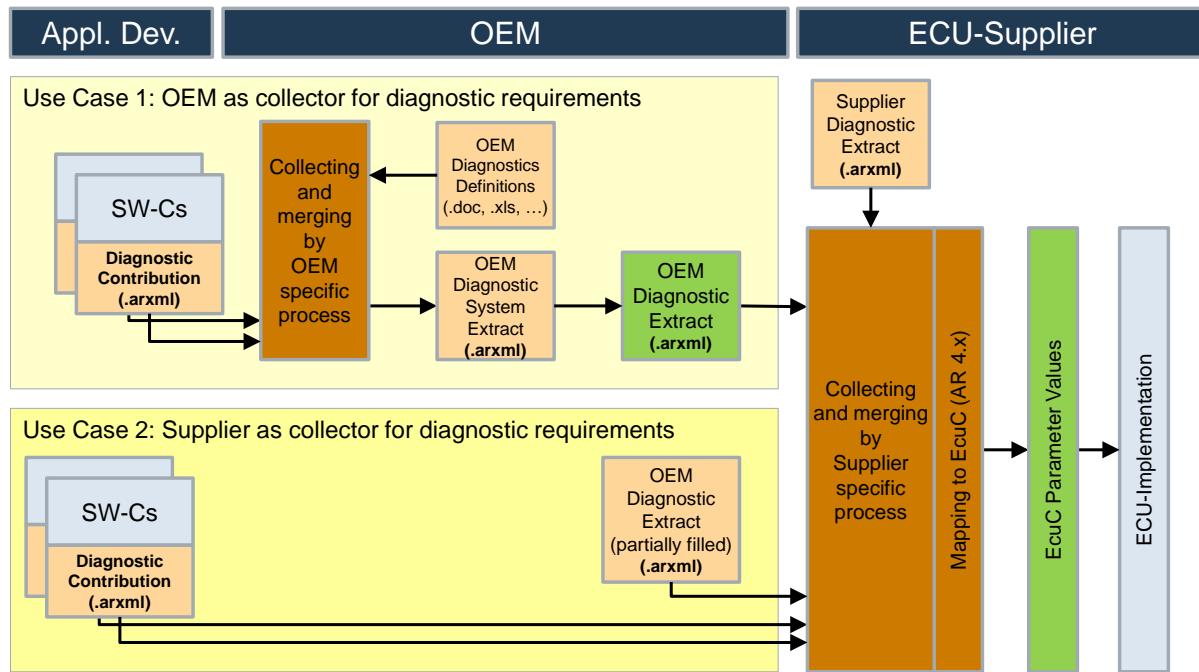


Figure 1.1: Scope of this document in the ECU Development work-flow

Figure 1.1 shows the configuration process of diagnostics for two generalized use cases. This process involves three parties:

- **OEM** or diagnostic requester
- **Application Developer** or Application Developer
- **ECU-Supplier** or integrator

The specific role of these contributors to the diagnostic extract is in detail explained in the following sub-chapters.

1.1.1 OEM

The **OEM** or requester of diagnostic data uses the [DiagnosticExtract](#) to define the diagnostic interfaces of one or multiple ECUs. It may also define some [InternalBehaviors](#) as requirements for the **ECU-Supplier** or **Application Developer**

- Defines the values of the DTCs
- Defines the UDS services and sub-services supported by the ECUs
- Defines the required events needed by a specific composition implemented by an **Application Developer**

NOTE: This list represents an example; this document does not define a specific ownership of each element.

In the first use case, the [DiagnosticExtract](#) is used to exchange information which is transformed into the EcuC configuration (M2 to M1 mapping, see also [3] and [7]).

Second, the **OEM** uses the [DiagnosticExtract](#) to document requirements to be implemented by a supplier. These requirements are expressed in textual language and can not be mapped directly to any EcuC configuration parameters (no M2 to M1 mapping possible).

1.1.2 Application Developer

The Application Developers implement their **software-components** with the corresponding **software-component description**. The role “Application Developer” can be assumed by both an OEM and a supplier. In other words, both OEM and supplier may contribute application software to a given ECU.

With the introduction of this concept, the Application Developer has the possibility to provide diagnostic information relevant to the software-components as part of the [DiagnosticExtract](#).

The Application Developer may also receive some input as requirement from the **OEM** within the [DiagnosticExtract](#) in textual form as for example:

- Definition of the content of a specific `ReadDataByIdentifier` implemented by this software-component
- Definition of the events needed for this software-component

NOTE: Only as example, this document does not define a specific ownership of each element.

In the first use case, the Application Developer defines the parameters of a specific `ReadDataByIdentifier`, i.e. the content of the diagnostic request but not the DID itself. The DID of this command will usually be defined by the **OEM**.

Secondly, the software-component events including information like Debouncing and `OperationCycle` may be defined by the **Application Developer**. The **Application Developer** may also define events and diagnostic jobs which are not needed by a specific **OEM** but for another one.

Suppliers may use the same software for multiple **OEMs** and need to reuse it. This implies that some [DiagnosticExtract](#) information coming from a software-component may be ignored during the integration if not needed for a specific project.

1.1.3 ECU-Supplier

The **ECU-Supplier** or integrator receives one or several [DiagnosticExtract](#) files from the **OEM** and from multiple **Application Developers**. The main goal of the In-

egrator is to integrate all delivered [DiagnosticExtract](#) and to generate the EcuC configuration from it.

Since this concept does not define a specific ownership for each element like DIDs, parameters of a UDS service, Events, Sessions, etc. the integrator has to ensure that the complete information is still valid after merging it.

- Mapping of DTCs to Events
- Merge of Events
- Mapping of services

Some DTCs may already be mapped to events - especially in cases where both come from the same party. But if the DTCs are defined by the **OEM** and the SW implemented by other supplier acting as an **Application Developer** the integrator has to ensure that both are mapped together.

In some cases, an Event may be defined multiple times. An **OEM** defines the Events which shall be implemented by an **Application Developer**. A Supplier implements a software-component which will be used in multiple projects and which also detects this type of error and also defines this same event.

Both events may have different naming but the same meaning. The integrator has to detect this redundancy during the integration and merge them together.

In another case, the **OEM** requires a specific `ReadDataByIdentifier` and an **Application Developer** implements it. If the implementation is performed for one specific project only, the **Application Developer** may map the DID from the **OEM** to the already defined job in their software-component.

In other cases in which the **Application Developer** implements a generic diagnostic job, it will be a task of the **ECU-Supplier** to merge this information and to map the jobs to the corresponding DID.

1.1.4 Exchanging of Files

During an ECU development project, the three main roles (OEM, Application Developer, ECU Integrator) exchange [DiagnosticExtract](#) files. The timing and frequency of exchanges and the content in each of these exchanged files is highly dependent on the individual project setup and situation.

Therefore, the [DiagnosticExtract](#) format has been designed to allow for gradual enrichment of definitions contributed at largely arbitrary points in time by the different roles in order to meet the needs of “Decentralized Configuration”.

For any exchange path between any two roles, the same file format based on the [DiagnosticExtract](#) template is used. It is then up to a company specific process and tooling to merge the collected [DiagnosticExtract](#) files while resolving conflicts (contradictions, redundancies etc.).

As final result, a consistent and complete [DiagnosticExtract](#) file is available which is input to derivation of the configuration for the diagnostic modules of the Basic Software.

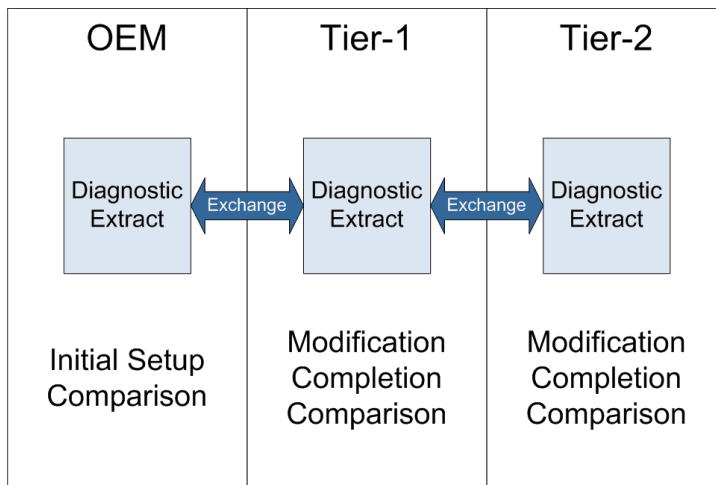


Figure 1.2: Exchange of diagnostic configuration between OEM, Tier-1, and Tier-2

Even after the [DiagnosticExtract](#) has been fully integrated and is ready to go for deriving the configuration of the diagnostic stack on EcuC level it is still foreseen to feed it back to e.g. an OEM.

In this case the OEM has the ability to review the configuration of the diagnostic stack on the level of the diagnostic extract.

At some point, this information may also be taken to (directly or via indirection of other formats) create a configuration of a diagnostic client.

1.1.5 Relationship to software-component Service Needs

Before the introduction of the Diagnostic Extract, Service Needs were used to describe diagnostic requirements on software-component level. These configuration requirements are referenced to the related BSW module DCM or DEM in order to provide the corresponding configuration on BSW level.

The usage of Service Needs is only possible on Atomic software-component level whereas the assignment of diagnostic demands must be possible on Composition level.

The software-component Service Needs within the software-component Description are still to be used along with the [DiagnosticExtract](#) in order to annotate the software-component ports which are relevant for further mapping and handling as defined by the [DiagnosticExtract](#).

From software-component Developer's perspective, the [DiagnosticExtract](#) is therefore used partially as substitution and partially as extension of the software-

component Service Needs. The reasoning for “substitution” is the avoidance of redundant diagnostic definitions.

Since some diagnostic properties potentially definable by software-component Developers are not covered in software-component Service Needs, the [DiagnosticExtract](#) can also be viewed as “extension” to the original purpose of software-component Service Needs.

1.1.6 Recommendation and Hints

Multiple parties may have different understanding of which parts shall be provided by each one. There is no defined rule to indicate who is responsible for each part. At the end, it is the **ECU-Supplier** in his role as integrator who has to ensure that all mappings are done and that the ECU runs as expected by the **OEM**.

In case the **OEM** does not have his own diagnostic requirements, the **ECU-Supplier** has to provide the complete [DiagnosticExtract](#). In this case, the **OEM** may only receive the [DiagnosticExtract](#) as part of the delivery. The process itself how the parties work with this format is not defined within this specification.

Figure 1.1 shows a recommended way how to handle the [DiagnosticExtract](#) between the different parties. In use case 1, some software-components are implemented by the **OEM** (or by a Supplier of the OEM) and the first merging of [DiagnosticExtract](#) data occurs at the **OEM**.

In use case 2, the **OEM** provides the diagnostic requirements via [DiagnosticExtract](#) and multiple **Application Developer** provide information related to their implementation, the merging is performed completely by the **ECU-Supplier**.

Also, a combination of use cases 1 and 2 is allowed. Also, the **ECU-Supplier** may implement some part of the SW inclusive their corresponding [DiagnosticExtract](#).

1.1.7 Limitations

This first release of the [DiagnosticExtract](#) template focuses on defining diagnostic requirements a single ECU only. That means that currently, distributed diagnostic functionality for a system or partial system consisting of multiple ECUs cannot be defined using the [DiagnosticExtract](#) template.

In future releases, the [DiagnosticExtract](#) template is expected to be extended to also cover configuration of distributed diagnostic functionality. Similar to the description of communication dependencies in the System Description, it shall be possible to describe diagnostic demands on system level to derive the diagnostic demands for a specific ECU from this description.

In general, the [DiagnosticExtract](#) does not support process-related parts to document the maturity of diagnostic configuration data. This means, that a data object

cannot be marked as “draft” or “released”. This issue needs to be solved by AUTOSAR within a general concept in a future release. Therefore, it does not make sense to introduce a solution for diagnostics only.

1.2 Scope

This document describes the formal description of contributions to the diagnostic configuration.

On the level of meta-modeling, the content described in this document conceptually relates to the definition of [SwcServiceDependency](#) or [BswServiceDependency](#), as defined by the Software Component Template [8] or Basic Software ModuleDescription Template [9].

Further relations exist to the specification of communication in AUTOSAR systems as described by the System Template [6].

Further relations exist to the specification of the Diagnostic Communication Manager [10] as well as to the Diagnostic Event Manager [11].

The relation of the [DiagnosticExtract](#) to the rest of the AUTOSAR meta-model is sketched in Figure 1.3.

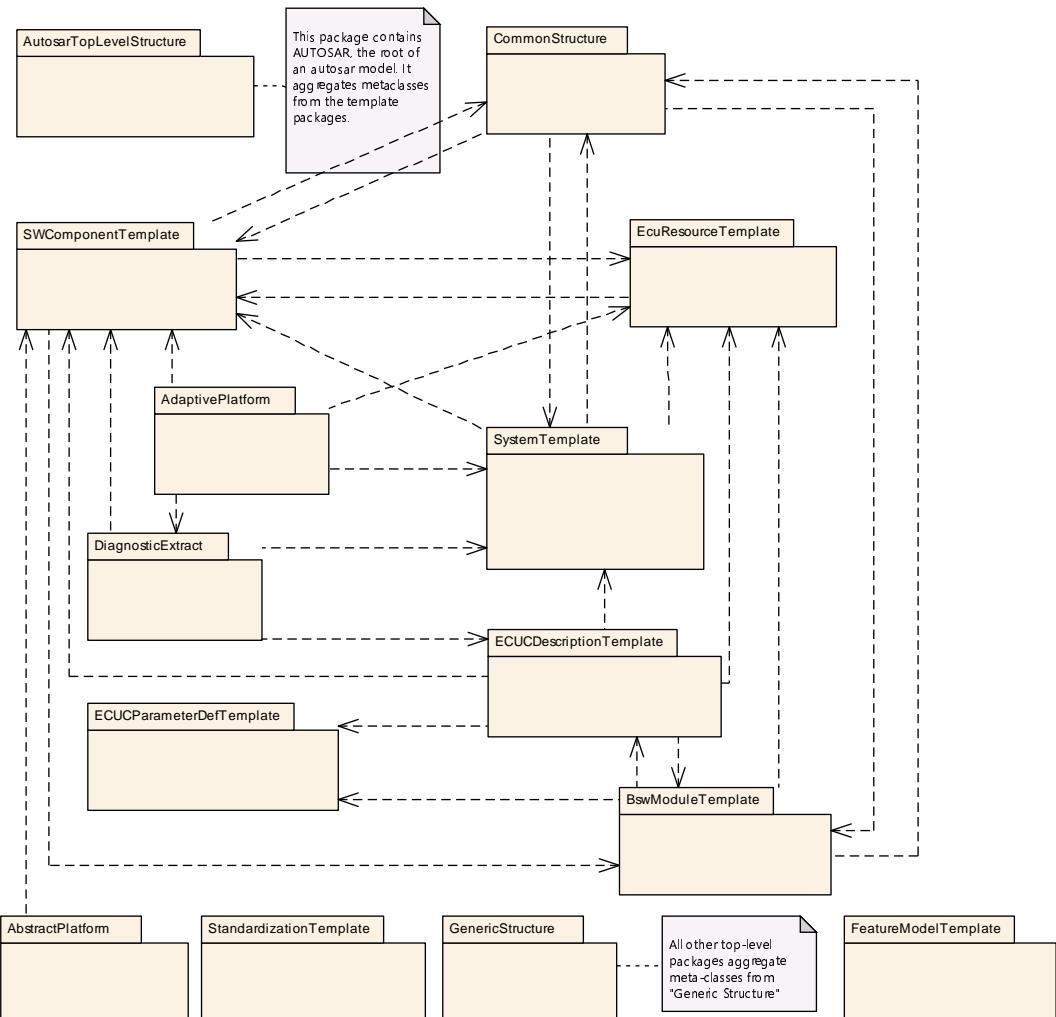


Figure 1.3: The relation of the [DiagnosticExtract](#) to the rest of the AUTOSAR meta-model

1.3 Binding Times of Constraints

Constraints in this document have different *actual* binding times depending on the platform that utilizes a [DiagnosticExtract](#). On the *AUTOSAR classic platform*, the binding time is defined as the **time when the Ecu configuration of the diagnostic stack is created**.

For the *AUTOSAR adaptive platform*, the binding time is identified as the **time when the creation of manifest content is completed**.

It would be very cumbersome to list the two binding times for the different platforms in each constraint separately. Therefore, whenever a constraint is equally applicable to both the *AUTOSAR adaptive platform* and the *AUTOSAR classic platform* the generic phrase “**at the time when the DEXT is complete**” is used.

1.4 Abbreviations

The following table contains a list of abbreviations used in the scope of this document along with the spelled-out meaning of each of the abbreviations.

Abbreviation	meaning
API	Application Programming Interface
BSW	Basic Software
BswM	Basic Software Manager
CAN	Controller Area Network
CSE	Codes for Scaling Units
DEM	Diagnostics Communication Manager
DCY	Driving Cycle
DEM	Diagnostics Event Manager
DID	Diagnostic Identifier
DTC	Diagnostic Trouble Code
DTR	Diagnostic Test Result
DoIP	Diagnostics over IP
ECU	Electrical Control Unit
ECUC	ECU Configuration
FID	Function Identifier
FIM	Function Inhibition Manager
GID	Group Identifier
ID	Identifier
IO	Input/Output
IP	Internet Protocol
IUMPR	In-Use Monitor Performance Ratio
ISO	International Organization for Standardization
LIN	Local Interconnect Network
NRC	Negative Response Code
OBD	On-Board Diagnostic
ODX	Open Diagnostic Data Exchange
OEM	Original Equipment Manufacturer
PDU	Protocol Data Unit
PID	Parameter Identifier
PTO	Power Take Off
RA	Routing Activation
RAM	Random Access Memory
RID	Routine Identifier
ROE	Response on Event
ROM	Read-Only Memory
RTE	Run-Time Environment
RS	Requirements Specification
RX	Receive
SPN	Suspect Parameter Number
SW	Software



△

Abbreviation	meaning
SWC	Software Component
SWCD	Software Component Description
TID	Test Identifier
TPS	Template Specification
TX	Transmit
SWS	Software Specification
UDS	Unified Diagnostic Services
UML	Unified Modeling Language
VFB	Virtual Functional Bus
VIN	Vehicle Identification Number
WWH-OBD	World-Wide Harmonized On-Board Diagnostics
XML	Extensible Markup Language
XSD	XML Schema Definition

Table 1.1: Abbreviations used in the scope of this Document

1.5 Document Conventions

Technical terms are typeset in mono spaced font, e.g. [PortPrototype](#). As a general rule, plural forms of technical terms are created by adding "s" to the singular form, e.g. [PortPrototypes](#). By this means the document resembles terminology used in the AUTOSAR XML Schema.

This document contains constraints in textual form that are distinguished from the rest of the text by a unique numerical constraint ID, a headline, and the actual constraint text starting after the [character and terminated by the] character.

The purpose of these constraints is to literally constrain the interpretation of the AUTOSAR meta-model such that it is possible to detect violations of the standardized behavior implemented in an instance of the meta-model (i.e. on M1 level).

Makers of AUTOSAR tools are encouraged to add the numerical ID of a constraint that corresponds to an M1 modeling issue as part of the diagnostic message issued by the tool.

The attributes of the classes introduced in this document are listed in form of class tables. They have the form shown in the example of the top-level element AUTOSAR:

Please note that constraints are not supposed to be enforceable at any given time in an AUTOSAR workflow. During the development of a model, constraints may legitimately be violated because an incomplete model will obviously show inconsistencies.

However, at specific points in the workflow, constraints shall be enforced as a safeguard against misconfiguration.

The points in the workflow where constraints shall be enforced, sometimes also known as the "binding time" of the constraint, are different for each model category, e.g. on the

classic platform, the constraints defined for software-components are typically enforced prior to the generation of the RTE while the constraints against the definition of an Ecu extract shall be applied when the Ecu configuration for the Com stack is created.

For each document, possible binding times of constraints are defined and the binding times are typically mentioned in the constraint themselves to give a proper orientation for implementers of AUTOSAR authoring tools.

Class	AUTOSAR			
Package	M2::AUTOSARTemplates::AutosarTopLevelStructure			
Note	Root element of an AUTOSAR description, also the root element in corresponding XML documents. Tags: xml.globalElement=true			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
adminData	AdminData	0..1	aggr	This represents the administrative data of an Autosar file. Tags: xml.sequenceOffset=10
arPackage	ARPackage	*	aggr	This is the top level package in an AUTOSAR model. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=arPackage.shortName, arPackage.variationPoint.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.sequenceOffset=30
fileInfoComment	FileInfoComment	0..1	aggr	This represents a possibility to provide a structured comment in an AUTOSAR file. Stereotypes: atpStructuredComment Tags: xml.roleElement=true xml.sequenceOffset=-10 xml.typeElement=false
introduction	DocumentationBlock	0..1	aggr	This represents an introduction on the Autosar file. It is intended for example to represent disclaimers and legal notes. Tags: xml.sequenceOffset=20

Table 1.2: AUTOSAR

The first rows in the table have the following meaning:

Class: The name of the class as defined in the UML model.

Package: The UML package the class is defined in. This is only listed to help locating the class in the overall meta model.

Note: The comment the modeler gave for the class (class note). Stereotypes and UML tags of the class are also denoted here.

Base Classes: If applicable, the list of direct base classes.

The headers in the table have the following meaning:

Attribute: The name of an attribute of the class. Note that AUTOSAR does not distinguish between class attributes and owned association ends.

Type: The type of an attribute of the class.

Mul.: The assigned multiplicity of the attribute, i.e. how many instances of the given data type are associated with the attribute.

Kind: Specifies, whether the attribute is aggregated in the class (`aggr` aggregation), an UML attribute in the class (`attr` primitive attribute), or just referenced by it (`ref` reference). Instance references are also indicated (`iref` instance reference) in this field.

Note: The comment the modeler gave for the class attribute (role note). Stereotypes and UML tags of the class are also denoted here.

Please note that the chapters that start with a letter instead of a numerical value represent the appendix of the document. The purpose of the appendix is to support the explanation of certain aspects of the document and does not represent binding conventions of the standard. The verbal forms for the expression of obligation specified in [TPS_STDT_00053] shall be used to indicate requirements, see Standardization Template, chapter Support for Traceability ([12]).

The representation of requirements in AUTOSAR documents follows the table specified in [TPS_STDT_00078], see Standardization Template, chapter Support for Traceability ([12]).

1.6 Requirements Tracing

The following table references the requirements specified in [13] and links to the fulfillment of these.

Requirement	Description	Satisfied by
[RS_DEXT_00001]	Diagnostic data exchange	[TPS_DEXT_01003] [TPS_DEXT_01004] [TPS_DEXT_01005] [TPS_DEXT_01007] [TPS_DEXT_01008] [TPS_DEXT_01014] [TPS_DEXT_01019] [TPS_DEXT_01020] [TPS_DEXT_01022] [TPS_DEXT_01023] [TPS_DEXT_01024] [TPS_DEXT_01025] [TPS_DEXT_01026] [TPS_DEXT_01027] [TPS_DEXT_01028] [TPS_DEXT_01029] [TPS_DEXT_01038] [TPS_DEXT_01046] [TPS_DEXT_01047] [TPS_DEXT_01055] [TPS_DEXT_01056] [TPS_DEXT_01057] [TPS_DEXT_01060] [TPS_DEXT_01066] [TPS_DEXT_01069] [TPS_DEXT_01075]
[RS_DEXT_00003]	SessionControl	[TPS_DEXT_01039] [TPS_DEXT_01045] [TPS_DEXT_01081] [TPS_DEXT_01082]
[RS_DEXT_00004]	ECUReset	[TPS_DEXT_01019] [TPS_DEXT_01020] [TPS_DEXT_01021] [TPS_DEXT_01045] [TPS_DEXT_01056]
[RS_DEXT_00005]	ClearDiagnosticInformation	[TPS_DEXT_01022] [TPS_DEXT_01045]
[RS_DEXT_00006]	ReadDTCInformation	[TPS_DEXT_01034] [TPS_DEXT_01045] [TPS_DEXT_01060]
[RS_DEXT_00007]	ReadDataByIdentifier	[TPS_DEXT_01045] [TPS_DEXT_01050] [TPS_DEXT_01054] [TPS_DEXT_01146]
[RS_DEXT_00008]	ReadMemoryByAddress	[TPS_DEXT_01024] [TPS_DEXT_01045]
[RS_DEXT_00009]	SecurityAccess	[TPS_DEXT_01036] [TPS_DEXT_01037] [TPS_DEXT_01038] [TPS_DEXT_01045] [TPS_DEXT_01053]
[RS_DEXT_00010]	CommunicationControl	[TPS_DEXT_01029] [TPS_DEXT_01030] [TPS_DEXT_01031] [TPS_DEXT_01032] [TPS_DEXT_01045] [TPS_DEXT_01057] [TPS_DEXT_01074]
[RS_DEXT_00011]	ReadDataByPeriodicIdentifier	[TPS_DEXT_01045]
[RS_DEXT_00012]	DynamicallyDefineDataIdentifier	[TPS_DEXT_01045]
[RS_DEXT_00013]	WriteDataByIdentifier	[TPS_DEXT_01045] [TPS_DEXT_01050] [TPS_DEXT_01054]
[RS_DEXT_00014]	IOControl	[TPS_DEXT_01015] [TPS_DEXT_01016] [TPS_DEXT_01017] [TPS_DEXT_01018] [TPS_DEXT_01045] [TPS_DEXT_01051] [TPS_DEXT_01150]
[RS_DEXT_00015]	RoutineControl	[TPS_DEXT_01035] [TPS_DEXT_01045] [TPS_DEXT_01049] [TPS_DEXT_01077] [TPS_DEXT_01078] [TPS_DEXT_01079] [TPS_DEXT_01080]
[RS_DEXT_00016]	RequestDownload	[TPS_DEXT_01027] [TPS_DEXT_01045]
[RS_DEXT_00017]	RequestUpload	[TPS_DEXT_01028] [TPS_DEXT_01045]
[RS_DEXT_00018]	TransferData	[TPS_DEXT_01026] [TPS_DEXT_01045]
[RS_DEXT_00019]	RequestTransferExit	[TPS_DEXT_01025] [TPS_DEXT_01045]
[RS_DEXT_00020]	WriteMemoryByAddress	[TPS_DEXT_01023] [TPS_DEXT_01045]
[RS_DEXT_00021]	ControlDTCSetting	[TPS_DEXT_01045] [TPS_DEXT_01075]
[RS_DEXT_00022]	ResponseOnEvent	[TPS_DEXT_01033] [TPS_DEXT_01045]
[RS_DEXT_00023]	Configuration of events	[TPS_DEXT_01048] [TPS_DEXT_01067] [TPS_DEXT_01068] [TPS_DEXT_01069] [TPS_DEXT_01083] [TPS_DEXT_01084] [TPS_DEXT_01085] [TPS_DEXT_01151] [TPS_DEXT_03002] [TPS_DEXT_03003] [TPS_DEXT_03004] [TPS_DEXT_03005] [TPS_DEXT_03007] [TPS_DEXT_03011] [TPS_DEXT_03015] [TPS_DEXT_03016]





Requirement	Description	Satisfied by
[RS_DEXT_00024]	Configuration of DTCs	[TPS_DEXT_01064] [TPS_DEXT_01065] [TPS_DEXT_01066] [TPS_DEXT_01086] [TPS_DEXT_03000] [TPS_DEXT_03003] [TPS_DEXT_03012] [TPS_DEXT_03013] [TPS_DEXT_03014]
[RS_DEXT_00025]	Combined Events	[TPS_DEXT_03003]
[RS_DEXT_00026]	Enable Conditions	[TPS_DEXT_03015] [TPS_DEXT_03018]
[RS_DEXT_00027]	Storage Conditions	[TPS_DEXT_03001] [TPS_DEXT_03006] [TPS_DEXT_03010] [TPS_DEXT_03016] [TPS_DEXT_03019]
[RS_DEXT_00028]	Enable Condition Groups	[TPS_DEXT_01084] [TPS_DEXT_03010] [TPS_DEXT_03015]
[RS_DEXT_00029]	Storage Condition Groups	[TPS_DEXT_01084] [TPS_DEXT_03016]
[RS_DEXT_00030]	Assignment of Enable Condition Groups	[TPS_DEXT_03010]
[RS_DEXT_00031]	Assignment of Storage Condition Group	[TPS_DEXT_03010]
[RS_DEXT_00032]	Configuration of Extended Data Records	[TPS_DEXT_03008]
[RS_DEXT_00033]	Configuration of Snapshot Records	[TPS_DEXT_01143] [TPS_DEXT_01144] [TPS_DEXT_03009]
[RS_DEXT_00034]	Description of Data Identifiers	[TPS_DEXT_01000] [TPS_DEXT_01001] [TPS_DEXT_01002] [TPS_DEXT_01017] [TPS_DEXT_01050] [TPS_DEXT_01054] [TPS_DEXT_01072] [TPS_DEXT_01134] [TPS_DEXT_01135] [TPS_DEXT_01136] [TPS_DEXT_01138] [TPS_DEXT_01146] [TPS_DEXT_01150]
[RS_DEXT_00035]	Description of Dynamic Data Identifiers	[TPS_DEXT_01000]
[RS_DEXT_00036]	Description of Routine Identifiers	[TPS_DEXT_01088]
[RS_DEXT_00037]	Description of I/O Identifiers	[TPS_DEXT_01089]
[RS_DEXT_00038]	Description of array data types	[TPS_DEXT_01001] [TPS_DEXT_01002]
[RS_DEXT_00039]	Diagnostic Service Table	[TPS_DEXT_01006]
[RS_DEXT_00040]	Diagnostic Sessions	[TPS_DEXT_01011] [TPS_DEXT_01081] [TPS_DEXT_01082] [TPS_DEXT_01139]
[RS_DEXT_00041]	Access Permissions	[TPS_DEXT_01012] [TPS_DEXT_01071]
[RS_DEXT_00042]	Security Levels	[TPS_DEXT_01012] [TPS_DEXT_01038] [TPS_DEXT_01053]
[RS_DEXT_00043]	Description of data elements	[TPS_DEXT_01142] [TPS_DEXT_03020]
[RS_DEXT_00045]	Textual descriptions	[TPS_DEXT_01064] [TPS_DEXT_01065] [TPS_DEXT_01066] [TPS_DEXT_01067] [TPS_DEXT_01068] [TPS_DEXT_01069] [TPS_DEXT_01071]
[RS_DEXT_00047]	Custom Diagnostic Service	[TPS_DEXT_01021] [TPS_DEXT_01030] [TPS_DEXT_01031] [TPS_DEXT_01147]
[RS_DEXT_00049]	Properties of individual diagnostic services	[TPS_DEXT_01013]
[RS_DEXT_00051]	Subfunctions of Diagnostic Services	[TPS_DEXT_01013] [TPS_DEXT_01014] [TPS_DEXT_01018] [TPS_DEXT_01019] [TPS_DEXT_01020] [TPS_DEXT_01021] [TPS_DEXT_01022] [TPS_DEXT_01023] [TPS_DEXT_01024] [TPS_DEXT_01025] [TPS_DEXT_01026] [TPS_DEXT_01027] [TPS_DEXT_01028] [TPS_DEXT_01029] [TPS_DEXT_01030] [TPS_DEXT_01031] [TPS_DEXT_01034] [TPS_DEXT_01039] [TPS_DEXT_01056] [TPS_DEXT_01057] [TPS_DEXT_01060] [TPS_DEXT_01075] [TPS_DEXT_01078]
[RS_DEXT_00052]	Mapping of diagnostic services to the PortPrototypes of Application SwComponentTypes	[TPS_DEXT_01040] [TPS_DEXT_01041] [TPS_DEXT_01042] [TPS_DEXT_01043] [TPS_DEXT_01044] [TPS_DEXT_01049] [TPS_DEXT_01050] [TPS_DEXT_01051] [TPS_DEXT_01142] [TPS_DEXT_03002] [TPS_DEXT_03007] [TPS_DEXT_03017] [TPS_DEXT_03018] [TPS_DEXT_03019] [TPS_DEXT_03020]





Requirement	Description	Satisfied by
[RS_DEXT_00053]	Debouncing of diagnostic events	[TPS_DEXT_01048] [TPS_DEXT_03004] [TPS_DEXT_03005] [TPS_DEXT_03017]
[RS_DEXT_00054]	Operation cycles	[TPS_DEXT_01086] [TPS_DEXT_01087]
[RS_DEXT_00055]	Aging	[TPS_DEXT_03021]
[RS_DEXT_00056]	Indicator	[TPS_DEXT_03022]
[RS_DEXT_00057]	RequestFileTransfer	[TPS_DEXT_01090]
[RS_DEXT_00058]	Indicate that an ECU supports ODB	[TPS_DEXT_01122]
[RS_DEXT_00059]	Support for different protocols	[TPS_DEXT_01124]
[RS_DEXT_00060]	Function	[TPS_DEXT_01096] [TPS_DEXT_01097] [TPS_DEXT_01098] [TPS_DEXT_01099] [TPS_DEXT_01100] [TPS_DEXT_01101] [TPS_DEXT_01121]
[RS_DEXT_00061]	Relationship between functions and diagnostic events	[TPS_DEXT_01095] [TPS_DEXT_01098] [TPS_DEXT_01099] [TPS_DEXT_01100] [TPS_DEXT_01101]
[RS_DEXT_00062]	Pre-configuration of the Fim when the Dem configuration is not yet available	[TPS_DEXT_01095]
[RS_DEXT_00063]	Relation between functions on Fim level and software-components	[TPS_DEXT_01102]
[RS_DEXT_00064]	Definition of an SPN	[TPS_DEXT_01103] [TPS_DEXT_01106]
[RS_DEXT_00065]	Definition of freeze frames on J1939	[TPS_DEXT_01104] [TPS_DEXT_01105]
[RS_DEXT_00066]	Mapping between a J1939 controller application and a software-component	[TPS_DEXT_01108]
[RS_DEXT_00067]	Definition of J1939 DTC	[TPS_DEXT_01107] [TPS_DEXT_01145]
[RS_DEXT_00068]	Definition of a Diagnostic Parameter Identifier	[TPS_DEXT_01092]
[RS_DEXT_00069]	Support for OBD Mode 0x01 (RequestCurrentPowertrainDiagnosticData)	[TPS_DEXT_01125]
[RS_DEXT_00070]	Support for OBD Mode 0x02 (RequestPowertrainFreezeFrameData)	[TPS_DEXT_01126]
[RS_DEXT_00071]	Support for OBD ModeModes 0x03 / 0x07 / 0x0A (RequestEmissionRelatedDiagnosticTroubleCodes)	[TPS_DEXT_01127]
[RS_DEXT_00072]	Support for OBD Mode 0x04 (ClearResetEmissionRelatedDiagnosticInformation)	[TPS_DEXT_01128]
[RS_DEXT_00073]	Support for OBD Mode 0x06 (RequestOnBoardMonitoringTestResults)	[TPS_DEXT_01129] [TPS_DEXT_01141]
[RS_DEXT_00074]	Support for OBD Mode 0x08 (RequestControlOfOnBoardDevice)	[TPS_DEXT_01130]
[RS_DEXT_00075]	Support for OBD Mode 0x09 (RequestVehicleInformation)	[TPS_DEXT_01131]
[RS_DEXT_00076]	Definition of Diagnostic Test Identifier	[TPS_DEXT_01132]
[RS_DEXT_00077]	Description of the utilization of UDS for supporting WWH-OBD	[TPS_DEXT_01133]





Requirement	Description	Satisfied by
[RS_DEXT_00078]	Support for In Use Monitor Performance Ratio	[TPS_DEXT_01148] [TPS_DEXT_01149]
[RS_DEXT_00079]	Support for environment conditions	[TPS_DEXT_01113] [TPS_DEXT_01114] [TPS_DEXT_01115] [TPS_DEXT_01116] [TPS_DEXT_01117] [TPS_DEXT_01118] [TPS_DEXT_01119] [TPS_DEXT_01120]
[RS_DEXT_00080]	Support for persisting Security Events	[TPS_DEXT_01153]
[RS_DEXT_00081]	Support for updating the Reporting Mode of Security Events	[TPS_DEXT_01152]

Table 1.3: Requirements Tracing

2 Use Cases

2.1 Use cases for diagnostic data exchange

The basic usage of the [DiagnosticExtract](#) is the exchange of diagnostic data between the different parties involved in the diagnostic development process to allow the configuration of the DCM and the DEM and to provide the description of corresponding application interfaces to implement diagnostic services and fault handling.

2.2 Configuration of DCM

The configuration of the DCM includes the setup of diagnostic services and the assignment of data objects provided by one or more software components (e.g. Composition 1, Composition 2).

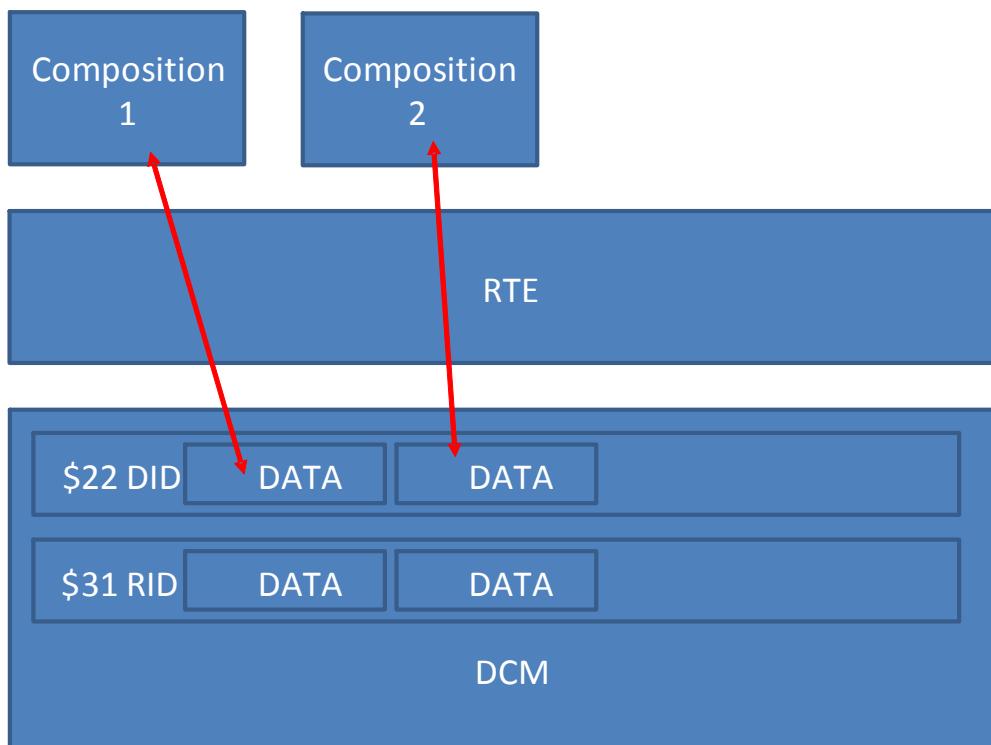


Figure 2.1: Assignment of DCM-related data objects

2.3 Configuration of DEM

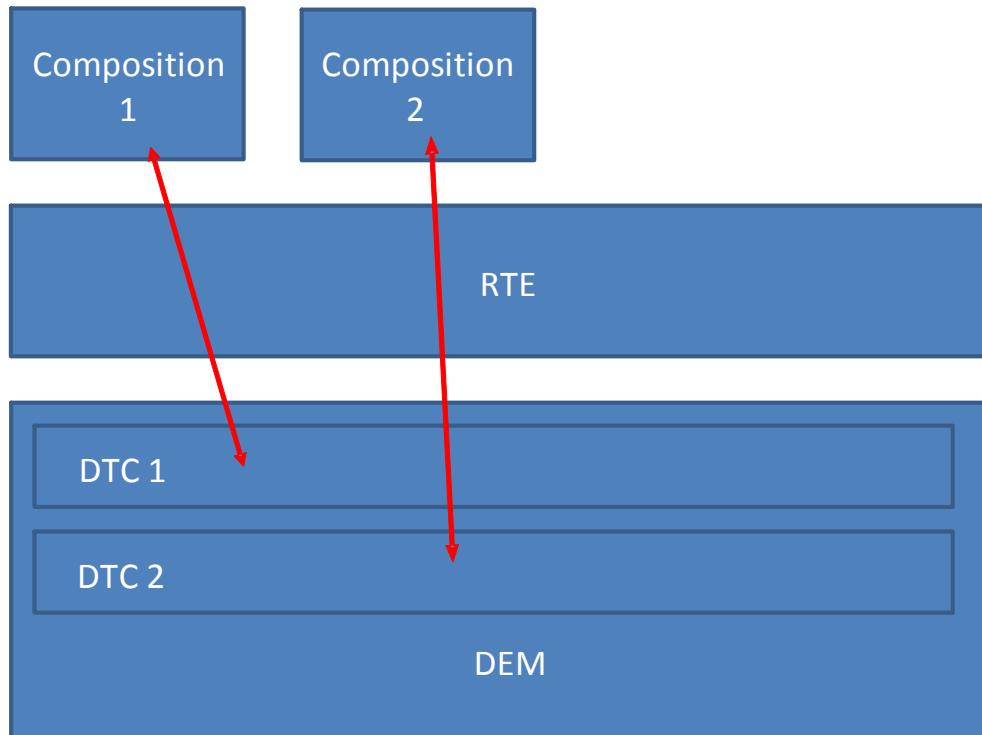


Figure 2.2: Assignment of DEM-related data objects

The configuration of the DEM includes fault memory data (DTCs and environmental data) and the assignment of corresponding data by one or more `SwComponentType`s (e.g. Composition 1, Composition 2).

As already explained, the diagnostic development process is distributed among different parties. On the one hand side, the OEM needs to describe the general requirements for a diagnostic system that have to be implemented by an ECU:

1. Depending on the diagnostic system, the OEM can provide a completely or partly-filled `DiagnosticExtract` including the description of `PortInterface`s:
 - Integrator/SWC developer (OEM or Tier 1) is responsible for the completion (detailing of predefined diagnostic content).
 - Integrator/SWC developer (OEM or Tier 1) is responsible for the specific configuration of diagnostic content defined by himself.
 - New integration of updated Diagnostic descriptions by integrator.
2. Return of completely or partly-filled `DiagnosticExtract` to OEM for:
 - Documentation

- ECU testing
- Integration reviews
- Failure correction

Use case examples:

- Configuration of UDS service 0x22 (ReadDataByIdentifier)
- Configuration of UDS service 0x2E (WriteDataByIdentifier)
- Configuration of UDS service 0x31 (RoutineControl)
- Configuration of UDS service 0x2F (I/O-Control)
- Configuration of DEM DTCs
- Configuration of Combined Events
- Mapping of events to DTCs
- Configuration of DTC-related environmental data
- Mapping of DEM Events to their corresponding Enable Conditions and Storage Conditions
- Configure general DCM parameters
- Description of diagnostic demands that are not relevant for code generation but have to be exchanged between OEM and Tier1 (e.g. set and reset condition for a DTC)

Refinement of use cases:

The OEM already provides a System Template for an ECU which describes the ECU Supplier SW parts as a [CompositionSwComponentType](#) where only inputs and outputs are known.

1. The OEM creates a [DiagnosticExtract](#) which describes the diagnostic interfaces of an ECU. Supported services are described (e.g. RDBI/WDBI/Routine Control) as well as their corresponding input/output parameters and return values (those which are optional in UDS standard).
2. SWC Developer at OEM or OEM SW Supplier develops SWC and also describes the Diagnostic information using [ServiceNeeds](#) as diagnostic contribution.
3. The OEM Diagnose Responsible for a Project creates the mappings between the [DiagnosticExtract](#) and the SWC available on OEM side (from 2.).
4. The OEM Diagnostic Responsible for a Project creates the mappings between the [DiagnosticExtract](#) and the [CompositionSwComponentType](#)s which will be implemented by the ECU Supplier or SW Developer.
5. The ECU Suppliers receives the ECU Extract including [DiagnosticExtract](#) from the OEM and imports it to the project.

6. In the same way as in point 2., the SWC Developer on supplier or Tier 2 side describes the Diagnostic information using [ServiceNeeds](#) as diagnostic contribution.

In the same way as in point 3: The ECU Supplier Diagnostic Responsible creates the mapping between the [PortInterface](#)s of the [DiagnosticExtract](#) (from 5.) and the [SwComponentType](#)s as provided in 6.

For the usage of indicators, it might happen that indicators defined on BSW level in DEM might not be automatically mapped to the implementation on SWC level. This would then require a manual mapping step by the integrator to resolve the mismatch.

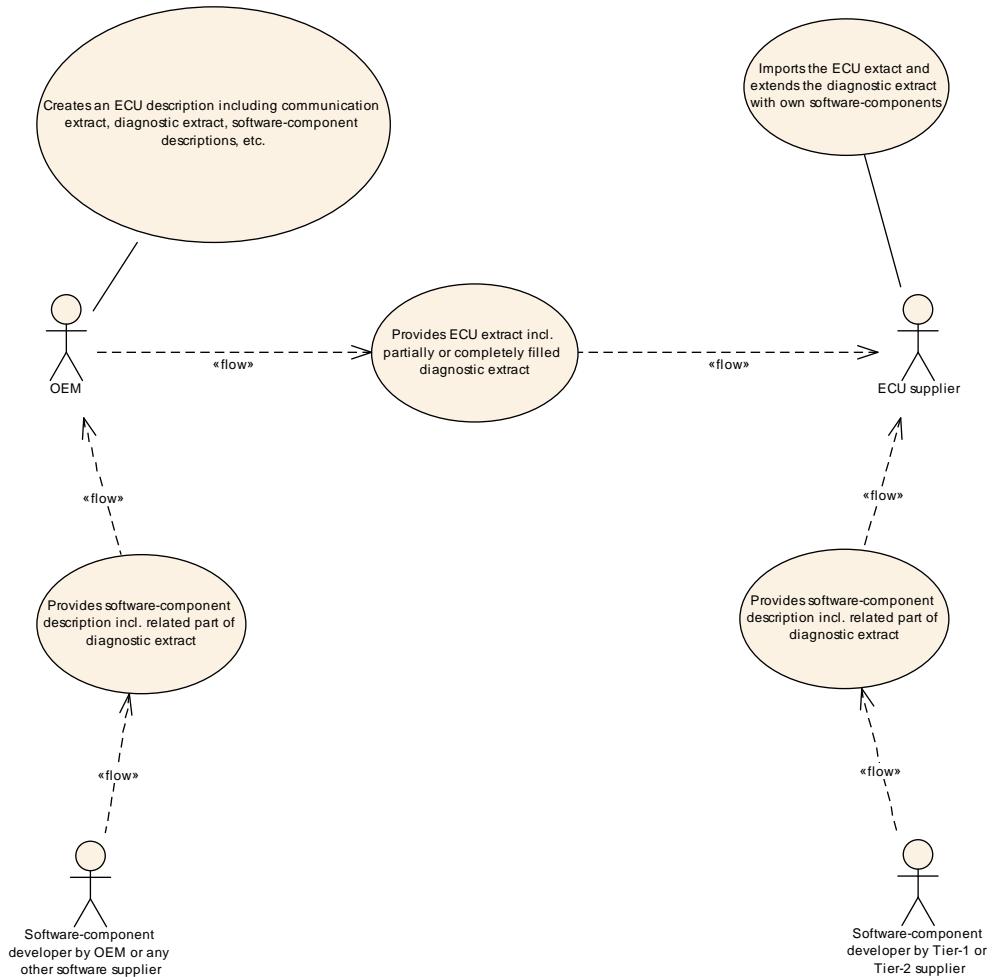


Figure 2.3: Workflow scenario for diagnostic data exchange

2.4 Configuration of the Fim

2.4.1 Model Function Inhibition

A typical use case for the Fim is the definition of “control mechanisms for software components and the functionality therein” [14]. By this means, the Fim can significantly

modify the behavior of the application software at run-time, e.g. in response to a sensor failure.

The conditions for deciding about inhibitions are derived from *diagnostic events*. If a *diagnostic event* that relates to a hardware sensor is reported as “failed” then the Fim can degrade the behavior of the application software to no longer rely on the sensor information that has become unreliable.

Consequently, the [DiagnosticExtract](#) needs to provide the basic mechanisms to create the definition of such inhibition rules that relate pieces of the application software (which are visible to the [DiagnosticExtract](#) as formally defined [SwComponentTypes](#)) to the definition of *diagnostic events*.

2.4.2 Model Fim configuration before Dem exists

The configuration of the Fim module and the Dem module are closely intertwined because the Fim uses the *diagnostic events* defined in the context of the Dem. This means that the Fim can only be configured if the Dem exists as a basis for creating this configuration.

Clearly, this is contradicting the approach of a “decentralized configuration” of the diagnostics stack’s behavior. It may happen that the configuration of the Fim and the configuration of the Dem by means of the [DiagnosticExtract](#) are distributed over different organizations within a concrete vehicle project.

However, the organizations would not be able to make progress independently of each other because the work product of one is the immediate prerequisite that the other organization can start working.

Therefore, one important use case for the [DiagnosticExtract](#) is the ability to configure the Fim module in the scope of the [DiagnosticExtract](#) **without the immediate need to already have access to the corresponding configuration of the Dem module.**

In other words, a typical work-flow could look like this:

1. Create the Fim configuration on the basis of a collection of alias objects that represent the *diagnostic events* that are defined in the context of the Dem module within the configuration of the Fim and **in parallel** create the Dem configuration and thereby add definitions of the actual *diagnostic events*.
2. Ship the configuration of the Dem to the organization that is responsible for the creation of the configuration of the Fim.
3. Let this organization take care of resolving the alias *diagnostic events* by way of referring from the Fim configuration to the *diagnostic events* contained in the actual Dem configuration.

2.5 Configuration of J1939 Diagnostics

Within the System Extract, J1939 diagnostic is configured on a service level by the diagnostic messages DM01 .. DM57, which will be handled by J1939 Dcm.

The diagnostic content which is provided by the diagnostic messages is defined within the [DiagnosticExtract](#) separately for each J1939 function, and contributes to the configuration of the J1939 Dcm as well as the parts of the Dem configuration that are relevant for J1939.

J1939 functions (known as Controller Application or CA within the SAE J1939 Standard [15]) are identified by a NAME and an address (assigned at run-time) and are represented in AUTOSAR by the [J1939NmNode](#).

2.5.1 Modeling of J1939 Diagnostic Aspects independent of the Deployment

The main use case for modeling the J1939 in the [DiagnosticExtract](#) is the possibility to create the diagnostic configuration relevant for a J1939 function, even if the underlying communication architecture is not (fully) defined and if no vehicle model (represented by a [System](#)) exists.

The J1939 diagnostics modeling is done during functional development before the [System](#) exists where the functions are deployed. This approach represents a case of decentralized configuration of the diagnostic stack.

2.5.2 J1939 Diagnostic Content modeled in the Diagnostic Extract

The diagnostic content for J1939 consists of the following topics:

SPN The Suspect Parameter Number is used throughout the J1939 specification to identify measured values (physical signals) and commands, the communication signals to which these are mapped, and diagnostic events caused by these.

Signals Communication signals that are relevant for diagnostics are specifically annotated, and reported by the J1939 diagnostics.

DTCs J1939 DTCs consist of an SPN, identifying the source of the diagnostic event, and an FMI (Failure Mode Indicator), identifying the problem with this source, like a boundary exception. In addition, an event counter is contained in the DTC.

Freeze Frames contain measured valued captured at the time a diagnostic event is reported as failed. J1939 supports two different kinds of freeze frames:

- **standardized freeze frames** (reported by DM04), which have a legislated layout
- **expanded freeze frames** (reported by DM24/DM25), which have a configurable layout

3 Conceptual Background

Chapter 1 has already given an overview on the intended way of using the [DiagnosticExtract](#) template and files. This chapter gives further background information on the overall concept behind the new format to create a better basis for understanding of the meta-model described in Chapter 4.

3.1 Definition of relevant Diagnostic Elements

[TPS_DEXT_01046] ECU configuration is not suitable to be exchanged between partners in an ECU development project [The ECU configuration (EcuC) parameters defined by the AUTOSAR Software Specification (SWS) documents for Dem and Dcm are not suitable to be exchanged between partners in an ECU development project.] ([RS_DEXT_00001](#))

Besides proprietary ways of using the EcuC format, the main reason for EcuC parameters being inappropriate to be exchanged is their closeness to implementation (e.g. parameter on buffer sizes).] ([RS_DEXT_00001](#))

[TPS_DEXT_01047] Differences in the development processes for diagnostics at automotive OEMs and ECU suppliers [Additionally, there are differences in the development processes for diagnostics at automotive OEMs and ECU suppliers resulting in different views on relevant diagnostic properties to be exchanged and different ways of deriving and defining them as diagnostic requirements.] ([RS_DEXT_00001](#))

Therefore, the identification of all diagnostic properties and requirements as superset from the companies' views forms the basis on which the [DiagnosticExtract](#) template has been defined.

3.2 Abstraction from EcuC Level

The [DiagnosticExtract](#) template does not only focus on relevant diagnostic properties and requirements but also - if required - lift them onto an appropriate abstraction level to make them meaningfully exchangeable (e.g. debouncing requirements that abstract from mapping on a concrete ECU).

However, for many EcuC parameters identified as relevant, an abstraction is not useful or not required and thus, these parameters are mapped 1:1 to equivalent elements of the [DiagnosticExtract](#) template.

[TPS_DEXT_01140] Values contained in [DiagnosticExtract](#) shall be taken for the derivation of basic software modules [The values specified in a given [DiagnosticExtract](#) shall be taken for the derivation of basic software modules in the diagnostic stack.] ()

This means that parameter values in the Ecuc are created that could be subject to constraints, e.g. a valid interval.] ()

Therefore, model elements in the [DiagnosticExtract](#) shall be carefully checked against the constraints formulated in EcuC. However, this document does not contain specific constraints on a detailed basis.

3.3 Independence of Definition

With respect to development processes, the [DiagnosticExtract](#) format also enables more independence when defining requirements on diagnostic functionality than possible with EcuC parameters. The approach of “decentralized configuration” is met in the [DiagnosticExtract](#) template in mainly two ways described in the following sub-chapters.

3.3.1 Use of <>atpSplittable<> enabling separation of elements over several physical files

Most elements of the [DiagnosticExtract](#) template can be split over several physical files. Therefore, parts of these elements (e.g. certain attributes) can be defined by, for example, an OEM and other parts of these elements by, for example, an ECU supplier.

3.3.2 Use of self-contained mapping elements

Many diagnostic requirements are established by mappings between diagnostic elements (e.g., DTC to DemEvent mapping). However, the “decentralized configuration” approach requires that these mappings can be flexibly defined at almost any time within the ECU development process and by any of the involved companies respectively roles.

Therefore, the [DiagnosticExtract](#) template defines self-contained mapping elements that have references to two (or potentially more) diagnostic elements to define a mapping.

The self-contained mapping elements can be created any time after the diagnostic elements to be mapped together have been defined. Alternatively, a mapping element can be created after only one diagnostic element has been defined indicating the need to make the mapping complete by defining the additional diagnostic element(s) to map to.

4 Common Meta Model Elements

4.1 Introduction

This chapter contains a description of the meta-model for the specification of the [DiagnosticExtract](#) in AUTOSAR. The goal of the specification of the [DiagnosticExtract](#) is to contribute to the description of the configuration of the Diagnostic Communication Manager [10] (Dcm) and the Diagnostic Event Manager [11] (Dem)

The meta-model can be roughly divided into five sections

- A common section that contains meta-classes shared between the description of the diagnostic services (that roughly corresponds to the Dcm) and the diagnostic event handling (that roughly corresponds to the Dem), see section [4.2](#).
- A section dedicated to the configuration of the diagnostic services, see section [5](#).
- A section dedicated to the configuration of the diagnostic event handling, see section [6](#).
- A section dedicated to the configuration of the functional inhibition from the diagnostics point of view, see section [7](#).
- A section dedicated to the configuration of the diagnostics on J1939, see section [8](#).

4.2 Data Identifier vs. Routine vs. Data Element

This chapter highlights the formal modeling of some of the central parts of AUTOSAR diagnostics when it comes to configuration. There are some concepts widely used that need to be reflected in the meta-model.

The purpose of the [DiagnosticCommonElement](#) is to provide a common reference target for all kinds of diagnostic elements. This aspect is explained in more detail in section [4.4](#).

The purpose of a [Data Identifier](#) (DID) is to associate a unique numerical value to a piece of data related to diagnostics. From the modeling point of view, this means that the modeling of the [Data Identifier](#) needs to provide an attribute that represents the numeric value as well as a relation to a [Data Element](#) representing a set of diagnostic piece of data.

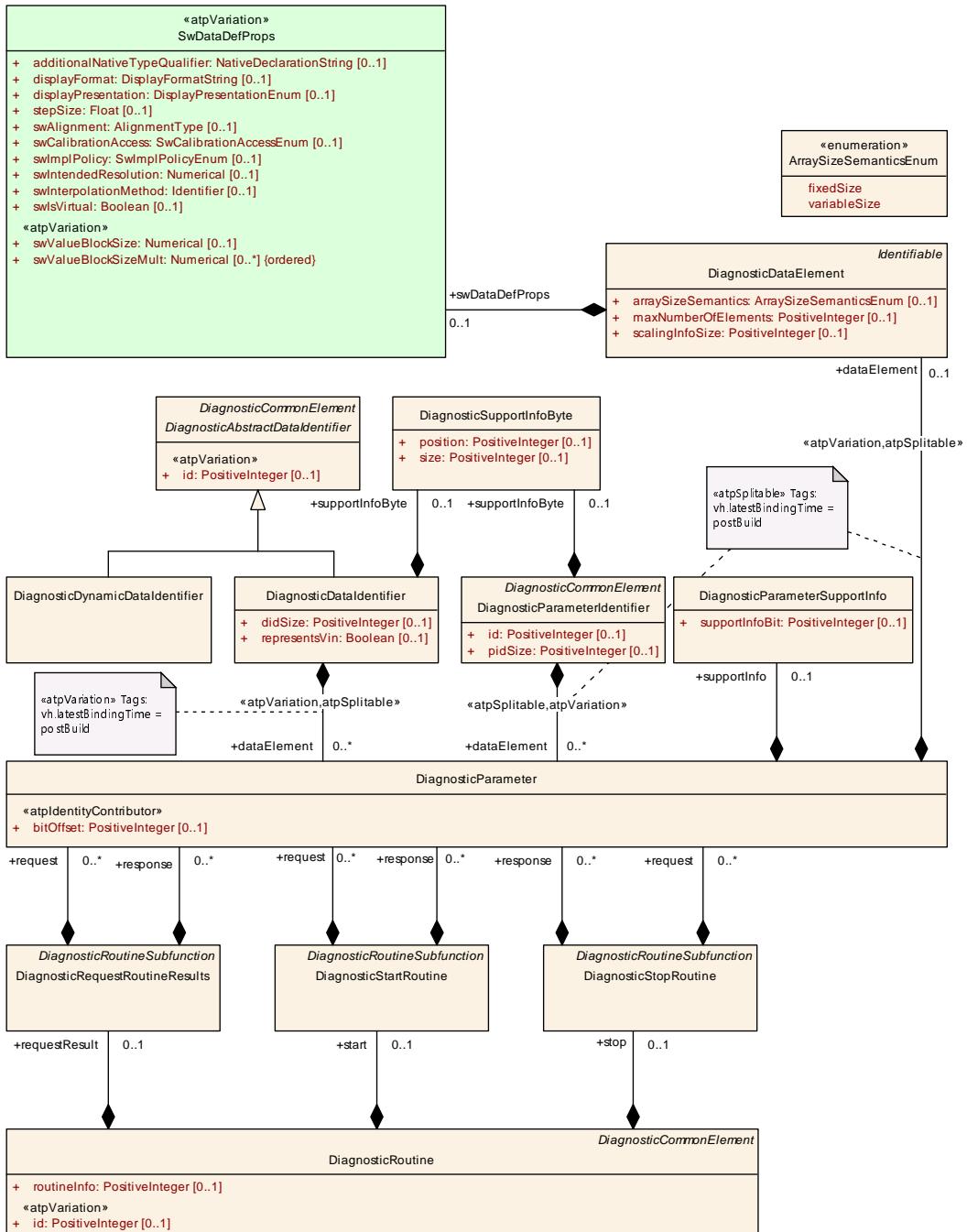


Figure 4.1: Common Diagnostic elements

[TPS_DEXT_01000] AUTOSAR diagnostics supports two kinds of data identifiers
 ┌ In AUTOSAR, two kinds of data identifiers are supported:

- The **DiagnosticDataIdentifier** inherits from **DiagnosticAbstractDataIdentifier** and is used to define data identifiers fully known at configuration time. A **DiagnosticDataIdentifier** shall have at least 1 **dataElement**.
- The **DiagnosticDynamicDataIdentifier** inherits from **DiagnosticAbstractDataIdentifier** and is used to define data identifiers fully known **only**

at run time. Consequently, there is **no formal means** to define `dataElement` at configuration time.

](*RS_DEXT_00034*, *RS_DEXT_00035*)

Class	<i>DiagnosticCommonElement</i> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents a common base class for all diagnostic elements. It does not contribute any specific functionality other than the ability to become the target of a reference.			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Packageable Element</i> , <i>Referable</i>			
Subclasses	<i>DiagnosticAbstractAliasEvent</i> , <i>DiagnosticAbstractDataIdentifier</i> , <i>DiagnosticAccessPermission</i> , <i>DiagnosticAging</i> , <i>DiagnosticCondition</i> , <i>DiagnosticConditionGroup</i> , <i>DiagnosticCustomServiceClass</i> , <i>DiagnosticDataIdentifierSet</i> , <i>DiagnosticEcuInstanceProps</i> , <i>DiagnosticEnvironmentalCondition</i> , <i>DiagnosticEvent</i> , <i>DiagnosticExtendedDataRecord</i> , <i>DiagnosticFimEventGroup</i> , <i>DiagnosticFreezeFrame</i> , <i>DiagnosticFunctionIdentifier</i> , <i>DiagnosticFunctionIdentifierInhibit</i> , <i>DiagnosticIndicator</i> , <i>DiagnosticInfoType</i> , <i>Diagnosticlumpr</i> , <i>DiagnosticlumprDenominatorGroup</i> , <i>DiagnosticlumprGroup</i> , <i>DiagnosticJ1939 ExpandedFreezeFrame</i> , <i>DiagnosticJ1939FreezeFrame</i> , <i>DiagnosticJ1939Node</i> , <i>DiagnosticJ1939Spn</i> , <i>DiagnosticJ1939SwMapping</i> , <i>DiagnosticMapping</i> , <i>DiagnosticMasterToSlaveEventMapping</i> , <i>Diagnostic MeasurementIdentifier</i> , <i>DiagnosticMemoryDestination</i> , <i>DiagnosticMemoryIdentifier</i> , <i>DiagnosticOperation Cycle</i> , <i>DiagnosticParameterIdentifier</i> , <i>DiagnosticPowertrainFreezeFrame</i> , <i>DiagnosticProtocol</i> , <i>Diagnostic Routine</i> , <i>DiagnosticSecurityLevel</i> , <i>DiagnosticServiceClass</i> , <i>DiagnosticServiceInstance</i> , <i>Diagnostic ServiceTable</i> , <i>DiagnosticSession</i> , <i>DiagnosticTestResult</i> , <i>DiagnosticTestRoutineIdentifier</i> , <i>Diagnostic TroubleCode</i> , <i>DiagnosticTroubleCodeGroup</i> , <i>DiagnosticTroubleCodeProps</i>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

Table 4.1: DiagnosticCommonElement

Class	<i>DiagnosticParameter</i>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to describe information relevant for the execution of a specific diagnostic service, i.e. it can be taken to parameterize the service.			
Base	<i>ARObject</i>			
Attribute	Type	Mult.	Kind	Note
bitOffset	PositiveInteger	0..1	attr	This represents the bitOffset of the DiagnosticParameter Stereotypes: atplIdentityContributor
dataElement	<i>DiagnosticDataElement</i>	0..1	aggr	This represents the related dataElement of the Diagnostic Parameter Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=dataElement.shortName, data Element.variationPoint.shortLabel vh.latestBindingTime=postBuild
supportInfo	<i>DiagnosticParameter SupportInfo</i>	0..1	aggr	This attribute represents the ability to define which bit of the support info byte is representing this part of the PID.

Table 4.2: DiagnosticParameter

[constr_1790] Existence of attribute `DiagnosticParameter.bitOffset` [For each `DiagnosticParameter`, attribute `bitOffset` shall exist **at the time when the DEXT is complete.**.](*)*

[constr_1791] Existence of attribute `DiagnosticParameter.dataElement` [For each `DiagnosticParameter`, attribute `dataElement` shall exist **at the time when the DEXT is complete.**.](*)*

Class	DiagnosticDataIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to model a diagnostic data identifier (DID) that is fully specified regarding the payload at configuration-time. Tags: atp.recommendedPackage=DiagnosticDataIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticAbstractDataIdentifier, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataElement	DiagnosticParameter	*	aggr	This is the dataElement associated with the Diagnostic DataIdentifier. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=dataElement.bitOffset, dataElement.variation Point.shortLabel vh.latestBindingTime=postBuild
didSize	PositiveInteger	0..1	attr	This attribute indicates the size in bytes of the Diagnostic DataIdentifier.
representsVin	Boolean	0..1	attr	This attribute indicates whether the specific Diagnostic DataIdentifier represents the vehicle identification.
supportInfoByte	DiagnosticSupportInfo Byte	0..1	aggr	This attribute represents the supported information associated with the DiagnosticDataIdentifier.

Table 4.3: DiagnosticDataIdentifier

[constr_1792] Existence of *DiagnosticDataIdentifier.dataElement* [For each *DiagnosticDataIdentifier*, the aggregation of *DiagnosticParameter* in the role *dataElement* shall exist at least once at the time when the DEXT is complete.]()

Class	DiagnosticDynamicDataIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to define a diagnostic data identifier (DID) at run-time. Tags: atp.recommendedPackage=DiagnosticDataIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticAbstractDataIdentifier, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 4.4: DiagnosticDynamicDataIdentifier

Class	DiagnosticAbstractDataIdentifier (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents an abstract base class for the modeling of a diagnostic data identifier (DID).			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	<i>DiagnosticDataIdentifier, DiagnosticDynamicDataIdentifier</i>			
Attribute	Type	Mult.	Kind	Note



△

Class	<i>DiagnosticAbstractDataIdentifier</i> (abstract)			
id	PositiveInteger	0..1	attr	<p>This is the numerical identifier used to identify the <i>DiagnosticAbstractDataIdentifier</i> in the scope of diagnostic workflow</p> <p>Stereotypes: atpVariation</p> <p>Tags:vh.latestBindingTime=preCompileTime</p>

Table 4.5: DiagnosticAbstractDataIdentifier

[constr_1793] Existence of attribute *DiagnosticAbstractDataIdentifier.id* [For each *DiagnosticAbstractDataIdentifier*, attribute *id* shall exist **at the time when the DEXT is complete.**]()

[TPS_DEXT_01072] Purpose of attribute *DiagnosticDataIdentifier.representsVin* [There is a use case for identifying a specific *DiagnosticDataIdentifier* that carries the so-called *vehicle identification number* (VIN).]

It is therefore important to be able to formally indicate this characteristic. For this purpose the attribute *DiagnosticDataIdentifier.representsVin* is available.] ([RS_DEXT_00034](#))

[constr_1324] Existence of attribute *DiagnosticDataIdentifier.representsVin* [Within the context of a given *DiagnosticContributionSet*, the attribute *DiagnosticDataIdentifier.representsVin* shall have the value *true* for only a single *DiagnosticDataIdentifier*.]()

Please note that the VIN is only relevant in the context of *diagnostics over IP* (DoIP). However, there is no constraint that bounds the validity of [constr_1324] to the existence of a *DiagnosticConnection* that is build on top of an IP stack.

If the attribute exists and there is no IP used then the meaning of the attribute is simply irrelevant. Anyway, this situation should not be attributed to a misconfiguration.

The concept of the *Data Element* represents a piece of information decomposed from the data identified by a DID and exchanged between the DEM and, for example, a tester.

The nature of such a *Data Element* could be compared to the nature of an *ISignal*¹ and therefore the modeling of a *Data Element* by means of the meta-class *DiagnosticDataElement* aggregates *SwDataDefProps* in the role *swDataDefProps* in order to provide a reference to *SwBaseType*.

The aggregation of *SwDataDefProps* can also be used to refer to a *DataConstr* in order to specify a valid data range for the *DiagnosticDataElement*.

¹which represents the payload in “regular” bus communication

Class	DiagnosticDataElement			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to describe a concrete piece of data to be taken into account for diagnostic purposes.			
Base	ARObject, <i>Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
arraySize Semantics	ArraySizeSemantics Enum	0..1	attr	This attribute controls the meaning of the value of the array size.
maxNumberOfElements	PositiveInteger	0..1	attr	The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.
scalingInfoSize	PositiveInteger	0..1	attr	Size in bytes of scaling information for the DiagnosticData Element if used with DiagnosticReadScalingDataBy Identifier
swDataDef Props	SwDataDefProps	0..1	aggr	This property allows to specify data definition properties in order to support the definition of e.g. computation formulae and data constraints.

Table 4.6: DiagnosticDataElement

[constr_1394] Value of DiagnosticDataElement.maxNumberOfElements depending on its existence [If the attribute DiagnosticDataElement.maxNumberOfElements exists then its value shall be greater than 0.]()

[TPS_DEXT_01134] Definition of a DiagnosticDataElement used in the context of a DID obtained by sender-receiver communication [If the DiagnosticDataElement is aggregated by a DiagnosticParameter that in turn is aggregated by a subclass of DiagnosticAbstractDataIdentifier and the DiagnosticDataElement is also referenced by a DiagnosticServiceDataMapping then the referenced DiagnosticDataElement (by way of SwDataDefProps) shall refer to a SwBaseType with attribute baseTypeSize set to either 8, 16, or 32 and attribute baseTypeEncoding set to either

- NONE (for 8, 16, or 32 bit) or
- 2C (for 8, 16, or 32 bit) or
- IEEE754 (for 32 bit).

In this case it is possible to define the DiagnosticDataElement either as a scalar or as an array (see [TPS_DEXT_01001], [TPS_DEXT_01002]).] (RS_DEXT_00034)

[TPS_DEXT_01135] Definition of a DiagnosticDataElement used in the context of a DID obtained by client/server communication [If the DiagnosticDataElement is aggregated by a DiagnosticParameter that in turn is aggregated by a subclass of DiagnosticAbstractDataIdentifier and the DiagnosticDataElement is also referenced by a DiagnosticServiceSwMapping then the referenced DiagnosticDataElement (by way of SwDataDefProps) shall refer to a SwBaseType with attribute baseTypeSize set to either 8, 16, or 32 and attribute baseTypeEncoding set to either

- NONE (for 8, 16, or 32 bit) or

- 2C (for 8, 16, or 32 bit) or
- IEEE754 (for 32 bit).

In this case it is only possible to define the `DiagnosticDataElement` as an array (see [TPS_DEXT_01001], [TPS_DEXT_01002]). The ability to define a Variable-Size Array shall only be used for the last element of the DID.] ([RS_DEXT_00034](#))

[TPS_DEXT_01136] Definition of a `DiagnosticDataElement` used in the context of a diagnostic routine [If the `DiagnosticDataElement` is aggregated by a `DiagnosticParameter` that in turn is aggregated by either a `DiagnosticStartRoutine`, `DiagnosticStopRoutine`, or `DiagnosticRequestRoutineResults` then the `DiagnosticDataElement` (by way of `SwDataDefProps`) shall refer to a `SwBaseType` with attribute `baseTypeSize` to either 8, 16, or 32 and attribute `baseTypeEncoding` set to either

- NONE (for 8, 16, or 32 bit) or
- 2C (for 8, 16, or 32 bit) or
- IEEE754 (for 32 bit).

In this case it is possible to define the `DiagnosticDataElement` either as a scalar or as an array (see [TPS_DEXT_01001], [TPS_DEXT_01002]). The ability to define a Variable-Size Array shall only be used for the last argument to the diagnostic routine.] ([RS_DEXT_00034](#))

[constr_1470] Value of `DiagnosticParameter.bitOffset` [The value of `DiagnosticParameter.bitOffset` shall only be set to a multiple of 8.]()

<i>Enumeration</i>	<code>ArraySizeSemanticsEnum</code>
<i>Package</i>	M2::AUTOSARTemplates::CommonStructure::ImplementationDataTypes
<i>Note</i>	This type controls how the information about the number of elements in an ApplicationArrayType is to be interpreted.
<i>Literal</i>	<i>Description</i>
fixedSize	This means that the ApplicationArrayType will always have a fixed number of elements. Tags: atp.EnumerationLiteralIndex=0
variableSize	This implies that the actual number of elements in the ApplicationArrayType might vary at run-time. The value of arraySize represents the maximum number of elements in the array. Tags: atp.EnumerationLiteralIndex=1

Table 4.7: `ArraySizeSemanticsEnum`

The attribute `DiagnosticDataIdentifier.didSize` should be used if size of the DID data is intended to be enforced².

[constr_1552] `DiagnosticDataIdentifier` referenced by `DiagnosticDataIdentifierSet` [If a `DiagnosticDataIdentifier` is referenced by `DiagnosticDataIdentifierSet` then the `DiagnosticDataIdentifier` shall not have gaps in between individual elements (as indicated by `DiagnosticParam-`

²one use case for this enforcement was described by the removed [constr_1471] contained in former versions of this document

eter.bitOffset and the length of the aggregated `DiagnosticDataElement`) or at the end of the `DiagnosticDataIdentifier` (as indicated by attribute `DiagnosticDataIdentifier.didSize`).
()

[TPS_DEXT_01138] Applicability of `DiagnosticDataIdentifier.supportInfoByte` [The attribute `DiagnosticDataIdentifier.supportInfoByte` may exist if the value of `DiagnosticDataIdentifier.id` is in the range 0xF400-0xF4FF.]

A typical case for the existence of `DiagnosticDataIdentifier.supportInfoByte` is the understanding that the `DiagnosticDataIdentifier` is relevant for OBD and the `DiagnosticDataIdentifier.id` is in the designated range.
]*(RS_DEXT_00034)*

[constr_1472] Existence of `DiagnosticDataIdentifier.supportInfoByte` [The attribute `DiagnosticDataIdentifier.supportInfoByte` shall not exist if the value of `DiagnosticDataIdentifier.id` is outside the range 0xF400-0xF4FF.]
()

4.2.1 Usage of `SwDataDefProps`

Please note that the definitions of properties like computation methods³, limits⁴, or units⁵ of diagnostic data elements is based on shared resources of the AUTOSAR meta-model, namely by aggregation of meta-class `SwDataDefProps`.

This meta-class contributes a wealth of possible properties related to the definition of data in general and, in this case, diagnostics in particular.

However, it is important to understand that `SwDataDefProps` is so expressive and versatile that its applicability needs to be constrained (in this specific case, see [constr_1325]) for specific deployments according to the requirements that originate from the semantics of the piece of data that is decorated by `SwDataDefProps`.

[constr_1325] Allowed attributes of `SwDataDefProps` for `DiagnosticDataElement.swDataDefProps` [The allowed attributes of `SwDataDefProps` for the aggregation in the role `DiagnosticDataElement.swDataDefProps` are defined in table 4.8.]
()

³formalized as `CompuMethod` in AUTOSAR

⁴formalized as `DataConstr` in AUTOSAR

⁵formalized as `Unit` in AUTOSAR

Attributes of <code>SwDataDefProps</code>	<code>DiagnosticDataElement.swDataDefProps</code>
<code>additionalNativeTypeQualifier</code>	N/A
<code>annotation</code>	N/A
<code>baseType.baseTypeDefinition.baseTypeEncoding</code>	D
<code>baseType.baseTypeDefinition.baseTypeSize</code>	D
<code>baseType.baseTypeDefinition.byteOrder</code>	D
<code>baseType.baseTypeDefinition.memAlignment</code>	N/A
<code>baseType.baseTypeDefinition.nativeDeclaration</code>	N/A
<code>compuMethod</code>	D
<code>dataConstr</code>	D
<code>displayFormat</code>	D
<code>displayPresentation</code>	N/A
<code>implementationDataType</code>	N/A
<code>invalidValue</code>	N/A
<code>swAddrMethod</code>	N/A
<code>swAlignment</code>	N/A
<code>swBitRepresentation</code>	N/A
<code>swCalibrationAccess</code>	N/A
<code>swCalprmAxisSet</code>	N/A
<code>swComparisonVariable</code>	N/A
<code>swDataDependency</code>	N/A
<code>swImplPolicy</code>	N/A
<code>swIntendedResolution</code>	N/A
<code>swInterpolationMethod</code>	N/A
<code>swIsVirtual</code>	N/A
<code>swPointerTargetProps</code>	N/A
<code>swRecordLayout</code>	N/A
<code>swRefreshTiming</code>	N/A
<code>swTextProps</code>	N/A
<code>swValueBlockSize</code>	N/A
<code>unit</code>	D
<code>valueAxisDataType</code>	N/A

Table 4.8: Allowed attributes of `SwDataDefProps` for `DiagnosticDataElement.swDataDefProps`

The following legend applies to table 4.8:

Abbr.	Description
D	Define the attribute independent from settings to the left.
I	Inherit the definition from the left for usage in the scope of this element.
N/A	Attribute is not applicable for usage in the scope of this element.
M	Attribute is meaningless in the scope of this element. As it was allowed in previous versions, declaring it as Not Applicable (NA) would break compatibility. Tools shall ignore such an attribute without a warning.

Table 4.9: Legend of table “Allowed attributes of `SwDataDefProps` for `DiagnosticDataElement.swDataDefProps`”

Please note that, in comparison to similar tables appearing in other AUTOSAR documents (e.g. [8]), table 4.8 intentionally goes into more detail regarding the applicability

of the attributes of [SwBaseType](#). This is in contrast to similar tables contained in, e.g. the specification of the Software-Component Template [8]

The attributes of [SwBaseType](#) are considered of **paramount importance for the definition of the semantics** of the enclosing [DiagnosticDataElement](#) and thus the emphasis is justified.

Class	<<atpVariation>> SwDataDefProps			
Package	M2::MSR::DataDictionary::DataDefProperties			
Note	<p>This class is a collection of properties relevant for data objects under various aspects. One could consider this class as a "pattern of inheritance by aggregation". The properties can be applied to all objects of all classes in which SwDataDefProps is aggregated.</p> <p>Note that not all of the attributes or associated elements are useful all of the time. Hence, the process definition (e.g. expressed with an OCL or a Document Control Instance MSR-DCI) has the task of implementing limitations.</p> <p>SwDataDefProps covers various aspects:</p> <ul style="list-style-type: none"> • Structure of the data element for calibration use cases: is it a single value, a curve, or a map, but also the recordLayouts which specify how such elements are mapped/converted to the Data Types in the programming language (or in AUTOSAR). This is mainly expressed by properties like swRecordLayout and swCalprmAxisSet • Implementation aspects, mainly expressed by swImplPolicy, swVariableAccessImplPolicy, swAddrMethod, swPointerTagetProps, baseType, implementationDataType and additionalNativeTypeQualifier • Access policy for the MCD system, mainly expressed by swCalibrationAccess • Semantics of the data element, mainly expressed by compuMethod and/or unit, dataConstr, invalidValue • Code generation policy provided by swRecordLayout <p>Tags:vh.latestBindingTime=codeGenerationTime</p>			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
additionalNativeTypeQualifier	NativeDeclarationString	0..1	attr	<p>This attribute is used to declare native qualifiers of the programming language which can neither be deduced from the baseType (e.g. because the data object describes a pointer) nor from other more abstract attributes. Examples are qualifiers like "volatile", "strict" or "enum" of the C-language. All such declarations have to be put into one string.</p> <p>Tags:xml.sequenceOffset=235</p>
annotation	Annotation	*	agr	<p>This aggregation allows to add annotations (yellow pads ...) related to the current data object.</p> <p>Tags: xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false </p>
baseType	SwBaseType	0..1	ref	Base type associated with the containing data object.
				Tags: xml.sequenceOffset=50
compuMethod	CompuMethod	0..1	ref	Computation method associated with the semantics of this data object.
				Tags: xml.sequenceOffset=180





Class	<>atpVariation>> SwDataDefProps			
dataConstr	DataConstr	0..1	ref	<p>Data constraint for this data object.</p> <p>Tags:xml.sequenceOffset=190</p>
displayFormat	DisplayFormatString	0..1	attr	<p>This property describes how a number is to be rendered e.g. in documents or in a measurement and calibration system.</p> <p>Tags:xml.sequenceOffset=210</p>
display Presentation	DisplayPresentation Enum	0..1	attr	<p>This attribute controls the presentation of the related data for measurement and calibration tools.</p>
implementation DataType	AbstractImplementation DataType	0..1	ref	<p>This association denotes the ImplementationDataType of a data declaration via its aggregated SwDataDefProps. It is used whenever a data declaration is not directly referring to a base type. Especially</p> <ul style="list-style-type: none"> • redefinition of an ImplementationDataType via a "typedef" to another ImplementationDatatype • the target type of a pointer (see SwPointerTarget Props), if it does not refer to a base type directly • the data type of an array or record element within an ImplementationDataType, if it does not refer to a base type directly • the data type of an SwServiceArg, if it does not refer to a base type directly <p>Tags:xml.sequenceOffset=215</p>
invalidValue	ValueSpecification	0..1	aggr	<p>Optional value to express invalidity of the actual data element.</p> <p>Tags:xml.sequenceOffset=255</p>
stepSize	Float	0..1	attr	<p>This attribute can be used to define a value which is added to or subtracted from the value of a DataPrototype when using up/down keys while calibrating.</p>
swAddrMethod	SwAddrMethod	0..1	ref	<p>Addressing method related to this data object. Via an association to the same SwAddrMethod it can be specified that several DataPrototypes shall be located in the same memory without already specifying the memory section itself.</p> <p>Tags:xml.sequenceOffset=30</p>
swAlignment	AlignmentType	0..1	attr	<p>The attribute describes the intended alignment of the DataPrototype. If the attribute is not defined the alignment is determined by the swBaseType size and the memory AllocationKeywordPolicy of the referenced SwAddr Method.</p> <p>Tags:xml.sequenceOffset=33</p>
swBit Representation	SwBitRepresentation	0..1	aggr	<p>Description of the binary representation in case of a bit variable.</p> <p>Tags:xml.sequenceOffset=60</p>
swCalibration Access	SwCalibrationAccess Enum	0..1	attr	<p>Specifies the read or write access by MCD tools for this data object.</p> <p>Tags:xml.sequenceOffset=70</p>
swCalprmAxis Set	SwCalprmAxisSet	0..1	aggr	<p>This specifies the properties of the axes in case of a curve or map etc. This is mainly applicable to calibration parameters.</p> <p>Tags:xml.sequenceOffset=90</p>





Class	<<atpVariation>> SwDataDefProps			
swComparisonVariable	SwVariableRefProxy	*	aggr	Variables used for comparison in an MCD process. Tags: xml.sequenceOffset=170 xml.typeElement=false
swDataDependency	SwDataDependency	0..1	aggr	Describes how the value of the data object has to be calculated from the value of another data object (by the MCD system). Tags: xml.sequenceOffset=200
swHostVariable	SwVariableRefProxy	0..1	aggr	Contains a reference to a variable which serves as a host-variable for a bit variable. Only applicable to bit objects. Tags: xml.sequenceOffset=220 xml.typeElement=false
swImplPolicy	SwImplPolicyEnum	0..1	attr	Implementation policy for this data object. Tags: xml.sequenceOffset=230
swIntendedResolution	Numerical	0..1	attr	The purpose of this element is to describe the requested quantization of data objects early on in the design process. The resolution ultimately occurs via the conversion formula present (compuMethod), which specifies the transition from the physical world to the standardized world (and vice-versa) (here, "the slope per bit" is present implicitly in the conversion formula). In the case of a development phase without a fixed conversion formula, a pre-specification can occur through swIntendedResolution. The resolution is specified in the physical domain according to the property "unit". Tags: xml.sequenceOffset=240
swInterpolationMethod	Identifier	0..1	attr	This is a keyword identifying the mathematical method to be applied for interpolation. The keyword needs to be related to the interpolation routine which needs to be invoked. Tags: xml.sequenceOffset=250
swIsVirtual	Boolean	0..1	attr	This element distinguishes virtual objects. Virtual objects do not appear in the memory, their derivation is much more dependent on other objects and hence they shall have a swDataDependency . Tags: xml.sequenceOffset=260
swPointerTargetProps	SwPointerTargetProps	0..1	aggr	Specifies that the containing data object is a pointer to another data object. Tags: xml.sequenceOffset=280
swRecordLayout	SwRecordLayout	0..1	ref	Record layout for this data object. Tags: xml.sequenceOffset=290
swRefreshTiming	MultidimensionalTime	0..1	aggr	This element specifies the frequency in which the object involved shall be or is called or calculated. This timing can be collected from the task in which write access processes to the variable run. But this cannot be done by the MCD system.





Class	<<atpVariation>> SwDataDefProps			
				<p style="text-align: right;">△</p> <p>So this attribute can be used in an early phase to express the desired refresh timing and later on to specify the real refresh timing.</p> <p>Tags:xml.sequenceOffset=300</p>
swTextProps	SwTextProps	0..1	aggr	<p>the specific properties if the data object is a text object.</p> <p>Tags:xml.sequenceOffset=120</p>
swValueBlockSize	Numerical	0..1	attr	<p>This represents the size of a Value Block</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=preCompileTime xml.sequenceOffset=80</p>
swValueBlockSizeMult (ordered)	Numerical	*	attr	<p>This attribute is used to specify the dimensions of a value block (VAL_BLK) for the case that that value block has more than one dimension.</p> <p>The dimensions given in this attribute are ordered such that the first entry represents the first dimension, the second entry represents the second dimension, and so on.</p> <p>For one-dimensional value blocks the attribute swValueBlockSize shall be used and this attribute shall not exist.</p> <p>Stereotypes: atpVariation</p> <p>Tags:vh.latestBindingTime=preCompileTime</p>
unit	Unit	0..1	ref	<p>Physical unit associated with the semantics of this data object. This attribute applies if no compuMethod is specified. If both units (this as well as via compuMethod) are specified the units shall be compatible.</p> <p>Tags:xml.sequenceOffset=350</p>
valueAxisDataType	ApplicationPrimitive Data Type	0..1	ref	<p>The referenced ApplicationPrimitiveDataType represents the primitive data type of the value axis within a compound primitive (e.g. curve, map). It supersedes CompuMethod, Unit, and BaseType.</p> <p>Tags:xml.sequenceOffset=355</p>

Table 4.10: SwDataDefProps

4.2.2 Definition of Arrays

There are several use cases for a [DiagnosticDataElement](#) that actually represents an array of information. In some cases the array size is static and will not change at run-time, and in some cases the array size needs to change at run-time to fulfill the intended purpose.

[TPS_DEXT_01001] Definition of a fixed-sized array [A [DiagnosticDataElement](#) shall be interpreted as a **fixed-size array** if all of the following conditions apply:

1. The attribute [DiagnosticDataElement.maxNumberOfElements](#) exists.
2. The value of the attribute [DiagnosticDataElement.maxNumberOfElements](#) is set to a value > 0.

3. The value of `DiagnosticDataElement.arraySizeSemantics` either does not exist or is set to `ArraySizeSemanticsEnum.fixedSize`.

](*RS_DEXT_00034, RS_DEXT_00038*)

[TPS_DEXT_01002] Definition of a variable-sized array [A `DiagnosticDataElement` shall be interpreted as a **variable-size array** if all of the following conditions apply:

1. The attribute `DiagnosticDataElement.maxNumberOfElements` exists.
2. The value of the attribute `DiagnosticDataElement.maxNumberOfElements` is set to a value > 0.
3. The value of `DiagnosticDataElement.arraySizeSemantics` is set to `ArraySizeSemanticsEnum.variableSize`.

The value of `DiagnosticDataElement.maxNumberOfElements` shall be considered the maximum array size in terms of the number of elements.](*RS_DEXT_00034, RS_DEXT_00038*)

[constr_1326] Existence of a variable-sized array [The value of the attribute `DiagnosticDataElement.arraySizeSemantics` shall not be set to `ArraySizeSemanticsEnum.variableSize` if the respective `DiagnosticDataElement` is referenced from a `DiagnosticServiceDataMapping`.]()

4.2.3 Definition of textual Strings

`DiagnosticDataElement` can be used to model a **textual string** that shall be send to or received from the ECU by the tester.

In this case it will be necessary to define the **intended encoding** such that the part of the software on the ECU that produces or consumes of the string on the ECU can be checked (after the establishment of a `DiagnosticMapping`) for a matching encoding specification.

The encoding in the scope of the `DiagnosticDataElement` can be defined using the attribute `DiagnosticDataElement.swDataDefProps.baseType.baseTypeDefnition.baseTypeEncoding`.

4.3 Textual Documentation

A Data Identifier also usually comes with some textual description that explains the meaning of the Data Identifier in short form. This ability is available via the inheritance from `Identifiable`, in particular by means of the attributes `desc` and/or `introduction` (see Figure 4.2).

This also means that the ability to add some form of textual description is widely usable in the scope of the [DiagnosticExtract](#). Many meta-classes are derived from e.g. [DiagnosticCommonElement](#) (which inherits from [Identifiable](#)) or directly from [Identifiable](#) and therefore qualify for the described form of documentation.

In other words, the technology described in Figures 4.2 and 4.3 is not limited to [DiagnosticDataElement](#) but has a much wider applicability in the context of the [DiagnosticExtract](#).

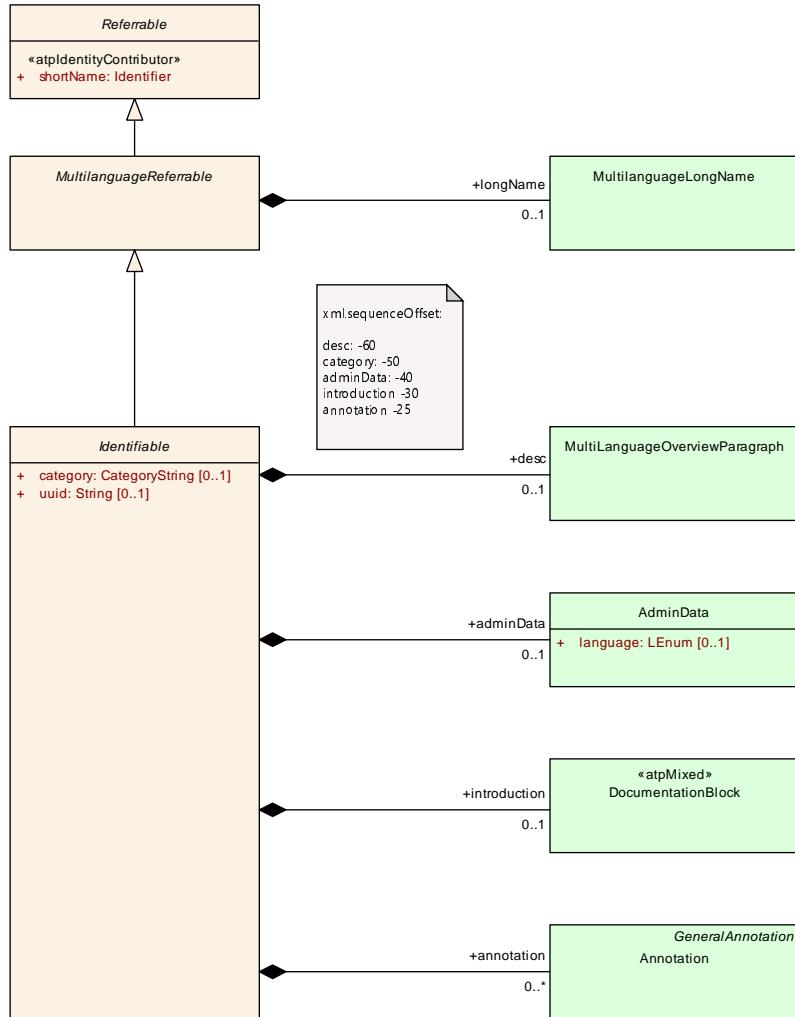


Figure 4.2: Definition of a textual description by means of [desc](#) and [introduction](#)

The details regarding the specification of textual content that goes along a given diagnostics element is detailed in Figure 4.3. In fact, [DocumentationBlock](#) provides a very sophisticated ability to define structured text that may consist e.g. of multiple paragraphs (formalized by meta-class [MultiLanguageOverviewParagraph](#) aggregated in the role [p](#)).

In addition to the ability to attach structured text, it is also possible to use the [annotation](#) (see Figure 4.2) to add short annotations (comparable to the usage of sticky notes) to diagnostic elements.

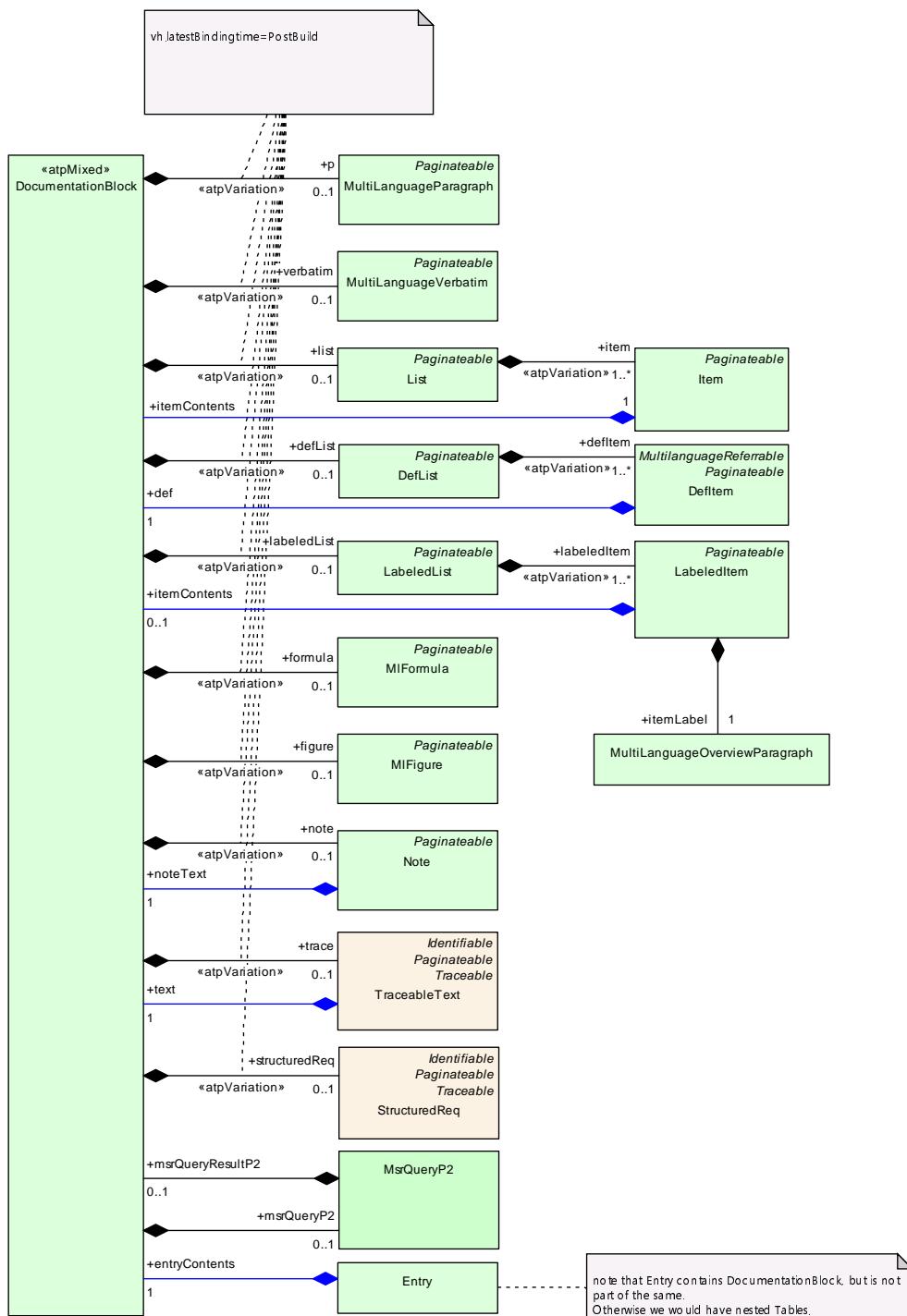


Figure 4.3: Details of the modeling of [DocumentationBlock](#)

Class	<<atpMixed>> DocumentationBlock			
Package	M2::MSR::Documentation::BlockElements			
Note	This class represents a documentation block. It is made of basic text structure elements which can be displayed in a table cell.			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
defList	DefList	0..1	aggr	<p>This represents a definition list in the documentation block.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=40</p>
figure	MIFigure	0..1	aggr	<p>This represents a figure in the documentation block.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=70</p>
formula	MIFormula	0..1	aggr	<p>This is a formula in the definition block.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=60</p>
labeledList	LabeledList	0..1	aggr	<p>This represents a labeled list.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=50</p>
list	List	0..1	aggr	<p>This represents numbered or unnumbered list.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=30</p>
msrQueryP2	MsrQueryP2	0..1	aggr	This represents automatically contributed contents provided by an msrquery in the context of Documentation Block.
note	Note	0..1	aggr	<p>This represents a note in the text flow.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=80</p>
p	MultiLanguage Paragraph	0..1	aggr	<p>This is one particular paragraph.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=10</p>
structuredReq	StructuredReq	0..1	aggr	<p>This aggregation supports structured requirements embedded in a documentation block.</p> <p>Stereotypes: atpVariation</p> <p>Tags: vh.latestBindingTime=postBuild xml.sequenceOffset=100</p>





Class	<>atpMixed>> DocumentationBlock			
trace	TraceableText	0..1	aggr	<p>This represents traceable text in the documentation block. This allows to specify requirements/constraints in any documentation block.</p> <p>The kind of the trace is specified in the category.</p> <p>Stereotypes: atpVariation</p> <p>Tags:</p> <ul style="list-style-type: none"> vh.latestBindingTime=postBuild xml.sequenceOffset=90
verbatim	MultiLanguageVerbatim	0..1	aggr	<p>This represents one particular verbatim text.</p> <p>Stereotypes: atpVariation</p> <p>Tags:</p> <ul style="list-style-type: none"> vh.latestBindingTime=postBuild xml.sequenceOffset=20

Table 4.11: DocumentationBlock

Class	MultiLanguageOverviewParagraph			
Package	M2::MSR::Documentation::TextModel::MultilanguageData			
Note	This is the content of a multilingual paragraph in an overview item.			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
I2	LOverviewParagraph	1..*	aggr	<p>This represents the text in one particular language.</p> <p>Tags:</p> <ul style="list-style-type: none"> xml.roleElement=true xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

Table 4.12: MultiLanguageOverviewParagraph

4.4 Diagnostic Contribution

[TPS_DEXT_01003] **DiagnosticContributionSet** is the central part of the **DiagnosticExtract** [The central part of formalization of the concept of the **DiagnosticExtract** is the **DiagnosticContributionSet**.

To some extent, it fulfills a similar role as the **System** [6] in the communication domain.] (**RS_DEXT_00001**)

The **DiagnosticContributionSet** maintains references to **DiagnosticCommonElement** and by this means the actual definition of the extent of diagnostic contribution takes place.

In other words, the actual extent of a given contribution is created by the collection of **DiagnosticCommonElement**s referenced by the **DiagnosticContributionSet**.

[TPS_DEXT_01004] **DiagnosticContributionSet** defines the scope of the **DiagnosticExtract** [The **DiagnosticContributionSet** has the ability to define the scope of the given **DiagnosticExtract**. This means that the **DiagnosticCon-**

`tributionSet` represents the `DiagnosticExtract` for the rest of the AUTOSAR model.

In other words, the `DiagnosticContributionSet` assumes a similar crucial role as the `System` in that it defines the extent to which a given description of diagnostic behavior is valid.

Any downstream processing of the description of diagnostic behavior shall take the scope of information to be processed from the definition of the `DiagnosticContributionSet` in its role as the root element of the description of diagnostic behavior.

During different stages of the design methodology, the scope of the `DiagnosticContributionSet` may vary between the scope of an entire system down to the contribution of a specific tier-1 supplier to a much bigger context.] ([RS_DEXT_00001](#))

[TPS_DEXT_01055] Standardized values of DiagnosticContributionSet.category [The scope of the `DiagnosticContributionSet`, on the other hand is determined by the value of its `category`. The following values are predefined by AUTOSAR:

DIAGNOSTICS_ABSTRACT_SYSTEM_DESCRIPTION this `DiagnosticContributionSet` represents a more or less high-level definition that can be taken as a template for creating concrete `DiagnosticContributionSets` of category `DIAGNOSTICS_SYSTEM_EXTRACT` or `DIAGNOSTICS_ECU_EXTRACT`

DIAGNOSTICS_SYSTEM_EXTRACT the scope of this `DiagnosticContributionSet` consists of several `EcuInstances`.

DIAGNOSTICS_ECU_EXTRACT the scope of this `DiagnosticContributionSet` consists of a **single** `EcuInstances`. A `DiagnosticContributionSet` of category `DIAGNOSTICS_ECU_EXTRACT` shall be taken as the basis for the derivation of service software-components of the diagnostic stack.

] ([RS_DEXT_00001](#))

[constr_1327] Multiplicity of DiagnosticEcuInstanceProps.ecuInstance [The multiplicity of `DiagnosticEcuInstanceProps.ecuInstance` shall be limited to 1 and the enclosing `DiagnosticContributionSet` shall only refer to at most one `DiagnosticEcuInstanceProps` **if** the enclosing `DiagnosticContributionSet` is of category `DIAGNOSTICS_ECU_EXTRACT`.] ()

[constr_1328] Consistency of DiagnosticEcuInstanceProps.ecuInstance and DiagnosticServiceTable.ecuInstance [Each `DiagnosticServiceTable` referenced by any given `DiagnosticContributionSet` in the role `serviceTable` shall define a reference in the role `DiagnosticServiceTable.ecuInstance` to an `EcuInstance` that is also referenced in the role `DiagnosticEcuInstanceProps.ecuInstance` by a `DiagnosticEcuInstanceProps` referenced by the mentioned `DiagnosticContributionSet` **if** the respective `DiagnosticContributionSet` is of category `DIAGNOSTICS_ECU_EXTRACT`.] ()

Please note that [constr_1328] resolves an intentional redundancy in the meta-model. Both `DiagnosticContributionSet` and `DiagnosticServiceTable` are able refer to `EcuInstance` with the idea that both `DiagnosticContributionSet` and `DiagnosticServiceTable` can be modeled independently of each other.

Of course, once the `DiagnosticContributionSet` and `DiagnosticServiceTable` are integrated in the same context (in particular by establishing the reference `DiagnosticContributionSet.serviceTable`) the individual references to the applicable `EcuInstances`s need to be consistent.

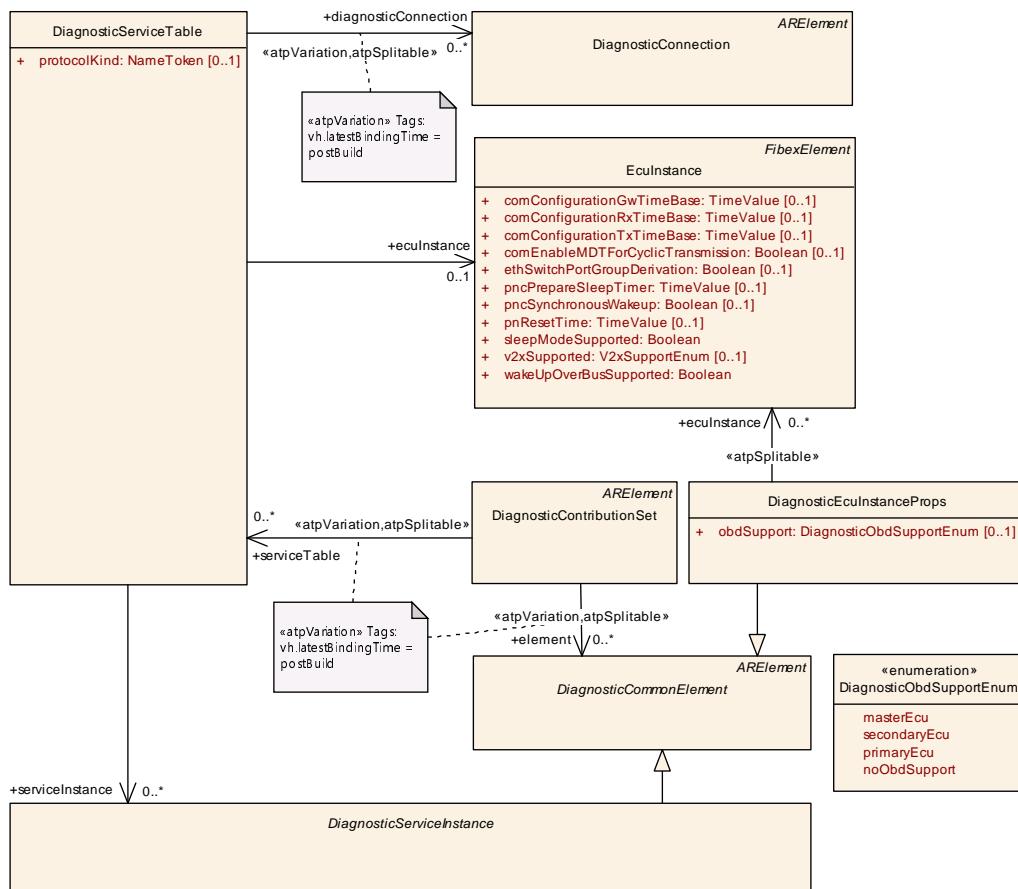


Figure 4.4: Diagnostic Contribution

[TPS DEXT 01005] DiagnosticContributionSet can exist independently

[The `DiagnosticContributionSet` has been modeled as an `ARElement` so that its instances can exist independently of the existence of context-providing model-elements inside a given `ARPackage`.] (RS_DEXT_00001)

[TPS_DEXT_01005] elaborates on an important aspect that makes the `DiagnosticExtract` independent of the existence of a context. For example, it would have been possible to aggregate `DiagnosticContributionSet` somewhere, e.g. at `System`.

This kind of modeling intentionally puts `DiagnosticContributionSet` on the same level as e.g. `System`, as far as model granularity is concerned.

Class	DiagnosticContributionSet			
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticContribution			
Note	This meta-class represents a root node of a diagnostic extract. It bundles a given set of diagnostic model elements. The granularity of the DiagnosticContributionSet is arbitrary in order to support the aspect of decentralized configuration, i.e. different contributors can come up with an own DiagnosticContribution Set. Tags: atp.recommendedPackage=DiagnosticContributionSets			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
common Properties	DiagnosticCommonProps	0..1	agr	This attribute represents a collection of diagnostic properties that are shared among the entire Diagnostic ContributionSet. Stereotypes: atpSplittable Tags: atp.Splitkey=commonProperties
element	DiagnosticCommonElement	*	ref	This represents a DiagnosticCommonElement considered in the context of the DiagnosticContributionSet Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=element.diagnosticCommonElement, element.variationPoint.shortLabel vh.latestBindingTime=postBuild
serviceTable	DiagnosticServiceTable	*	ref	This represents the collection of DiagnosticServiceTables to be considered in the scope of this Diagnostic ContributionSet. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel vh.latestBindingTime=postBuild

Table 4.13: DiagnosticContributionSet

The purpose of the **DiagnosticContributionSet** is to refer to all **DiagnosticCommonElements** that are relevant in the context of the **DiagnosticContributionSet**.

It is not sufficient that a given **DiagnosticCommonElement** is referenced by another **DiagnosticCommonElement** but is not referenced by the same **DiagnosticContributionSet** that also references the referencing **DiagnosticCommonElement**.

[constr_1745] Indirect reference to DiagnosticCommonElement [If a **DiagnosticCommonElement** is referenced from within the context of another **DiagnosticCommonElement** and the referencing **DiagnosticCommonElement** is in turn referenced by a **DiagnosticContributionSet** in the role **element** then the referenced **DiagnosticCommonElement** shall also be referenced by the same **DiagnosticContributionSet**.]()

Example: a **DiagnosticDataIdentifier** that is referenced by a **DiagnosticDataIdentifierSet** that is referenced by a **DiagnosticContributionSet** shall also be referenced by that **DiagnosticContributionSet**. This scenario is depicted in Figure 4.5.

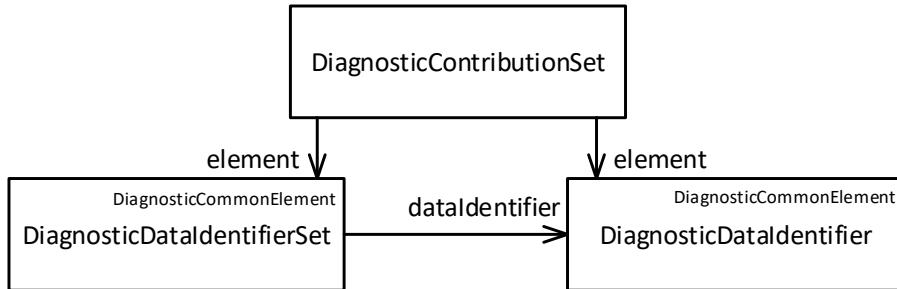


Figure 4.5: Visualization of example scenario for the indirect reference to [DiagnosticCommonElement](#)

4.5 Diagnostic Protocol

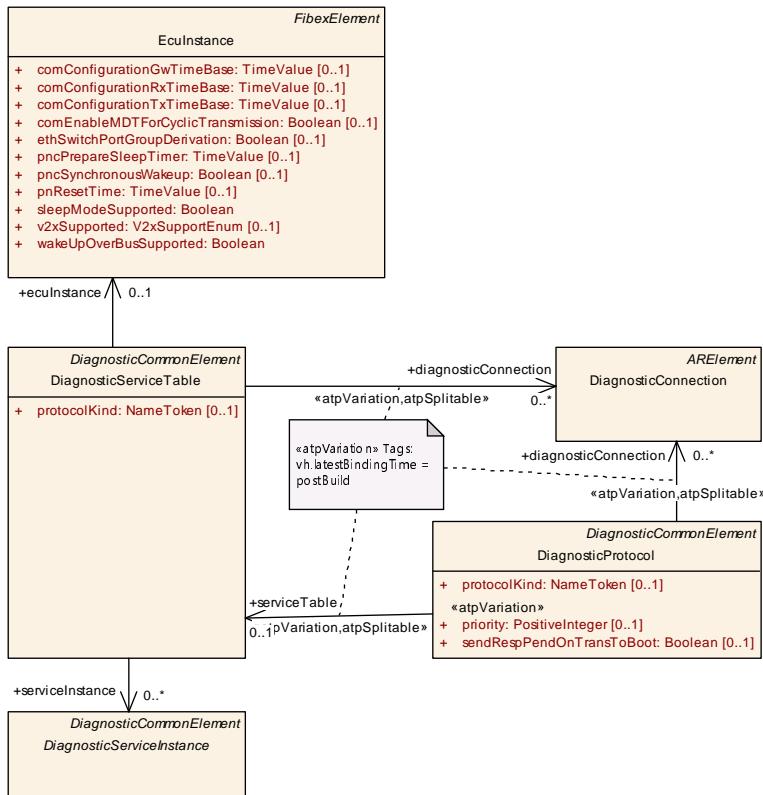
[TPS_DEXT_01124] Semantics of meta-class [DiagnosticProtocol](#) [The meta-class [DiagnosticProtocol](#) can be used to describe the usage of different diagnostic protocols as well as their priority.] ([RS_DEXT_00059](#))

Class	DiagnosticProtocol			
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticContribution			
Note	This meta-class represents the ability to define a diagnostic protocol. Tags: atp.recommendedPackage=DiagnosticProtocols			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
diagnostic Connection	DiagnosticConnection	*	ref	<p>This represents the collection of applicable Diagnostic Connections for this DiagnosticProtocol.</p> <p>Stereotypes: atpSplittable; atpVariation Tags:atp.Splitkey=diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
priority	PositiveInteger	0..1	attr	<p>This represents the priority of the diagnostic protocol in comparison to other diagnostic protocols. Lower numeric values represent higher protocol priority:</p> <ul style="list-style-type: none"> • 0 - Highest protocol priority • 255 - Lowest protocol priority <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
protocolKind	NameToken	0..1	attr	This identifies the applicable protocol.





Class	DiagnosticProtocol			
sendRespPendOnTransToBoot	Boolean	0..1	attr	<p>The purpose of this attribute is to define whether or not the ECU should send a NRC 0x78 (response pending) before transitioning to the bootloader (in this case the attribute shall be set to "true") or if the transition shall be initiated without sending NRC 0x78 (in this case the attribute shall be set to "false").</p> <p>Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime</p>
serviceTable	DiagnosticServiceTable	0..1	ref	<p>This represents the service table applicable for the given diagnostic protocol.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>

Table 4.14: DiagnosticProtocol

Figure 4.6: Modeling of DiagnosticProtocol

[constr_1794] Existence of attribute `DiagnosticProtocol.priority` [For each `DiagnosticProtocol`, attribute `priority` shall exist at the time when the DEXT is complete.]()

[constr_1795] Existence of attribute `DiagnosticProtocol.protocolKind` [For each `DiagnosticProtocol`, attribute `protocolKind` shall exist at the time when the DEXT is complete.]()

Each `DiagnosticProtocol` refers to at most one `DiagnosticServiceTable` and to a collection of `DiagnosticConnections`.

Please note that both `DiagnosticServiceTable` and `DiagnosticProtocol` have an attribute named `protocolKind`.

Class	<code>DiagnosticServiceTable</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticContribution			
Note	This meta-class represents a model of a diagnostic service table, i.e. the UDS services applicable for a given ECU. Tags: atp.recommendedPackage=DiagnosticServiceTables			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
diagnosticConnection	<code>DiagnosticConnection</code>	*	ref	<p>This represents the <code>DiagnosticConnection</code> that is taken for handling the data transmission for the enclosing <code>DiagnosticServiceTable</code>.</p> <p>It is possible to refer to more than one <code>DiagnosticConnections</code> in order to support more than one diagnostic tester.</p> <p>Stereotypes: atpSplitable; atpVariation Tags: atp.SplitKey=diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
ecuInstance	<code>EcuInstance</code>	0..1	ref	This represents the applicable <code>EcuInstance</code> for this <code>DiagnosticServiceTable</code> .
protocolKind	<code>NameToken</code>	0..1	attr	This identifies the applicable protocol.
serviceInstance	<code>DiagnosticServiceInstance</code>	*	ref	This represents the collection of <code>DiagnosticServiceInstances</code> to be considered in the scope of this <code>DiagnosticServiceTable</code> ,

Table 4.15: `DiagnosticServiceTable`

[constr_1796] Existence of attribute `DiagnosticServiceTable.serviceInstance` [For each `DiagnosticServiceTable`, attribute `serviceInstance` shall exist **at the time when the DEXT is complete.**.]()

[constr_1797] Existence of attribute `DiagnosticServiceTable.protocolKind` [For each `DiagnosticServiceTable`, attribute `protocolKind` shall exist **at the time when the DEXT is complete.**.]()

The attribute `DiagnosticServiceTable.protocolKind` shall be used to define the applicability of a `DiagnosticServiceTable` for a given protocol before the formal definition of the protocol even exists.

In other words, the attribute gives the designer of the `DiagnosticServiceTable` a means to express an intention about the usage of the `DiagnosticServiceTable`.

The attribute `DiagnosticServiceTable.protocolKind`, on the other hand, is used to define the actual nature of the `DiagnosticProtocol`.

By means of `DiagnosticProtocol.serviceTable` both “ends” of this aspect are put together and therefore it is reasonable to express a constraint about the value of attribute `protocolKind`.

[constr_1405] Value of `DiagnosticProtocol.serviceTable` vs. `DiagnosticServiceTable.protocolKind` [If the reference `DiagnosticProtocol.serviceTable` exists then the value of `DiagnosticProtocol.protocolKind` shall be identical to the value of `DiagnosticServiceTable.protocolKind`.]()

[TPS_DEXT_01006] The role of `DiagnosticServiceTables` [The existence of a `DiagnosticServiceTable` creates a formal relation between a collection of `DiagnosticServiceInstances` and the `DiagnosticConnection` that formalizes a *conduit* for specific pairs of diagnostic request and response messages taken to transmit the diagnostic service invocations from a tester to the applicable instance of the AUTOSAR diagnostic stack and convey the response of the diagnostic stack back to the tester.

In particular, this means that a `DiagnosticServiceTable` describes the set of `DiagnosticServiceInstances` that are available via `DiagnosticConnection` which is finally a request message to address a diagnostic service to an ECU and a response message to be used by the ECU to respond to the service.] (*RS_DEXT_00039*)

Class	<code>DiagnosticConnection</code>			
Package	M2::AUTOSARTemplates::SystemTemplate::DiagnosticConnection			
Note	DiagnosticConneection that is used to describe the relationship between several TP connections. Tags:atp.recommendedPackage=DiagnosticConnections			
Base	<i>ARElement, AROObject, CollectableElement, Identifiable, MultilanguageReferrable, Packageable Element, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
functional Request	TpConnectionIdent	*	ref	Reference to functional request messages.
periodic ResponseUudt	PduTriggering	*	ref	Reference to UUDT responses.
physical Request	TpConnectionIdent	0..1	ref	Reference to a physical request message.
response	TpConnectionIdent	0..1	ref	In the vast majority of cases a response is required. However, there are also cases where providing the response is not possible and/or not allowed.
responseOn Event	TpConnectionIdent	0..1	ref	Reference to a ROE message.

Table 4.16: `DiagnosticConnection`

Here is an example of a service table for UDS diagnostics:

\$14 - GroupOfDTC: 0xFFFFFFF

\$19 - Subfunction: \$02, Subfunction \$06

\$22 - DataID: 0x1111, DataID: 0x2222

\$2E - DataID: 0x1111, DataID: 0x2222

\$2F - IO-ID:0x3333

[TPS_DEXT_01091] Relation between a DiagnosticServiceTable and one or more DiagnosticConnections [In principle, the relation between a `DiagnosticServiceTable` and one or more `DiagnosticConnection`s can be established in two possible ways:

- By means of the reference `DiagnosticServiceTable.diagnosticConnection`. This way, the concept of protocols and their priorities relative to each other is **not** considered.
- By means of the references `DiagnosticProtocol.diagnosticConnection` and `DiagnosticProtocol.serviceTable`. This way, the existence of several protocols and their priorities is **positively considered**.

]()

Please note that alternatives mentioned in [TPS_DEXT_01091] may or may not be handled as alternatives in actual projects. It may be possible that in a first modeling step protocols are ignored entirely and therefore the respective relations are created by means of `DiagnosticServiceTable.diagnosticConnection`.

Later in time and as the project progresses, protocols may become a thing and are consequently introduced in the model. In response to this change, the relation in question is now created by means of the references `DiagnosticProtocol.diagnosticConnection` and `DiagnosticProtocol.serviceTable`.

However, the existing relation created by means of the reference `DiagnosticServiceTable.diagnosticConnection` is not necessarily required to be removed. It may just as well continue to exist. However, in this case an obvious consistency rule as described in [constr_1406] applies.

[constr_1406] DiagnosticServiceTable.diagnosticConnection vs. DiagnosticProtocol.diagnosticConnection [If a `DiagnosticServiceTable` exists that fulfills the following conditions:

- reference `DiagnosticServiceTable.diagnosticConnection` exists
- the `DiagnosticServiceTable` is referenced by means of `DiagnosticProtocol.serviceTable`

then all of the `DiagnosticConnection`s referenced by means of `DiagnosticServiceTable.diagnosticConnection` shall also be referenced in the role `diagnosticConnection` from a `DiagnosticProtocol` that in turn references the respective `DiagnosticServiceTable` in the role `DiagnosticProtocol.serviceTable`.]

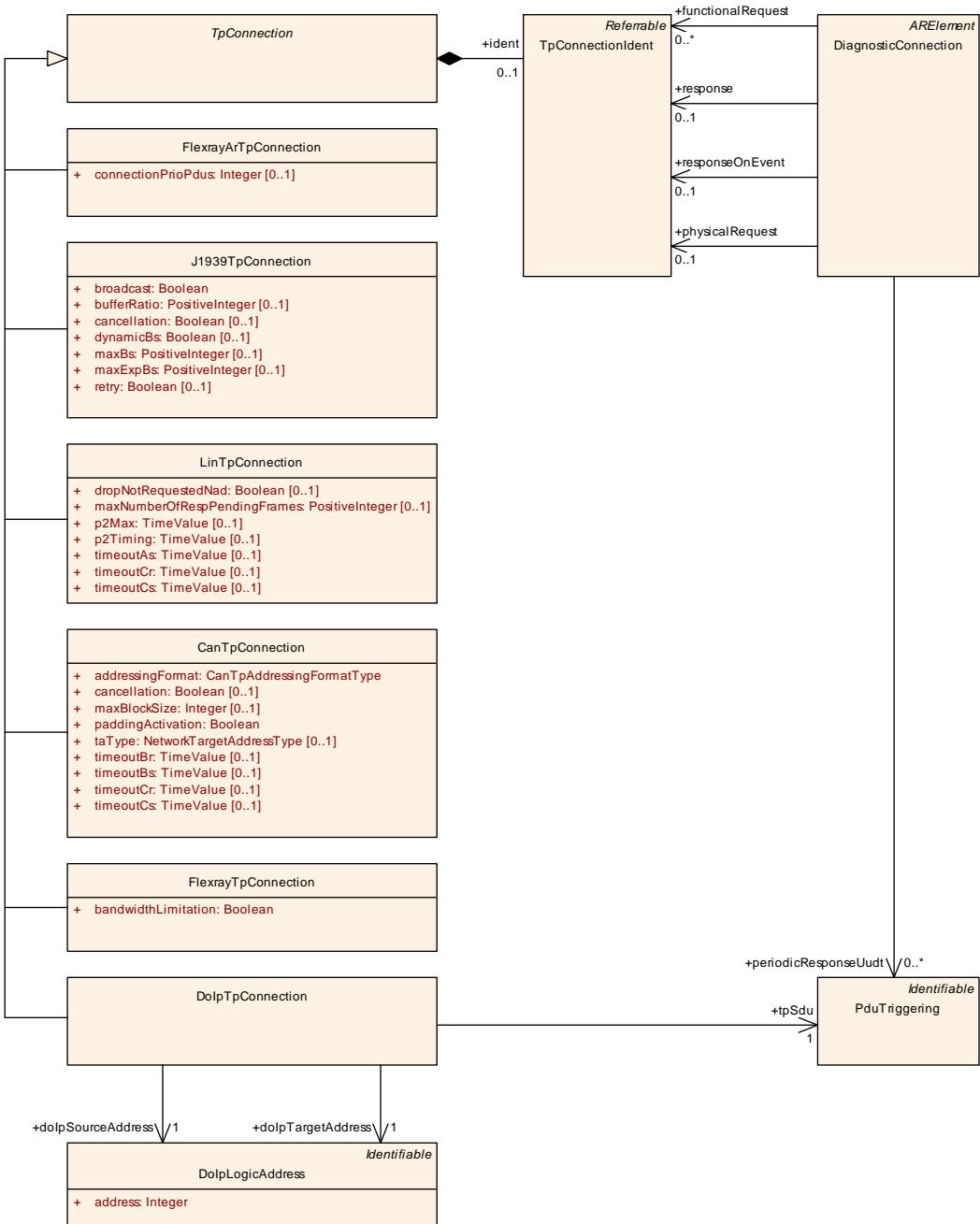
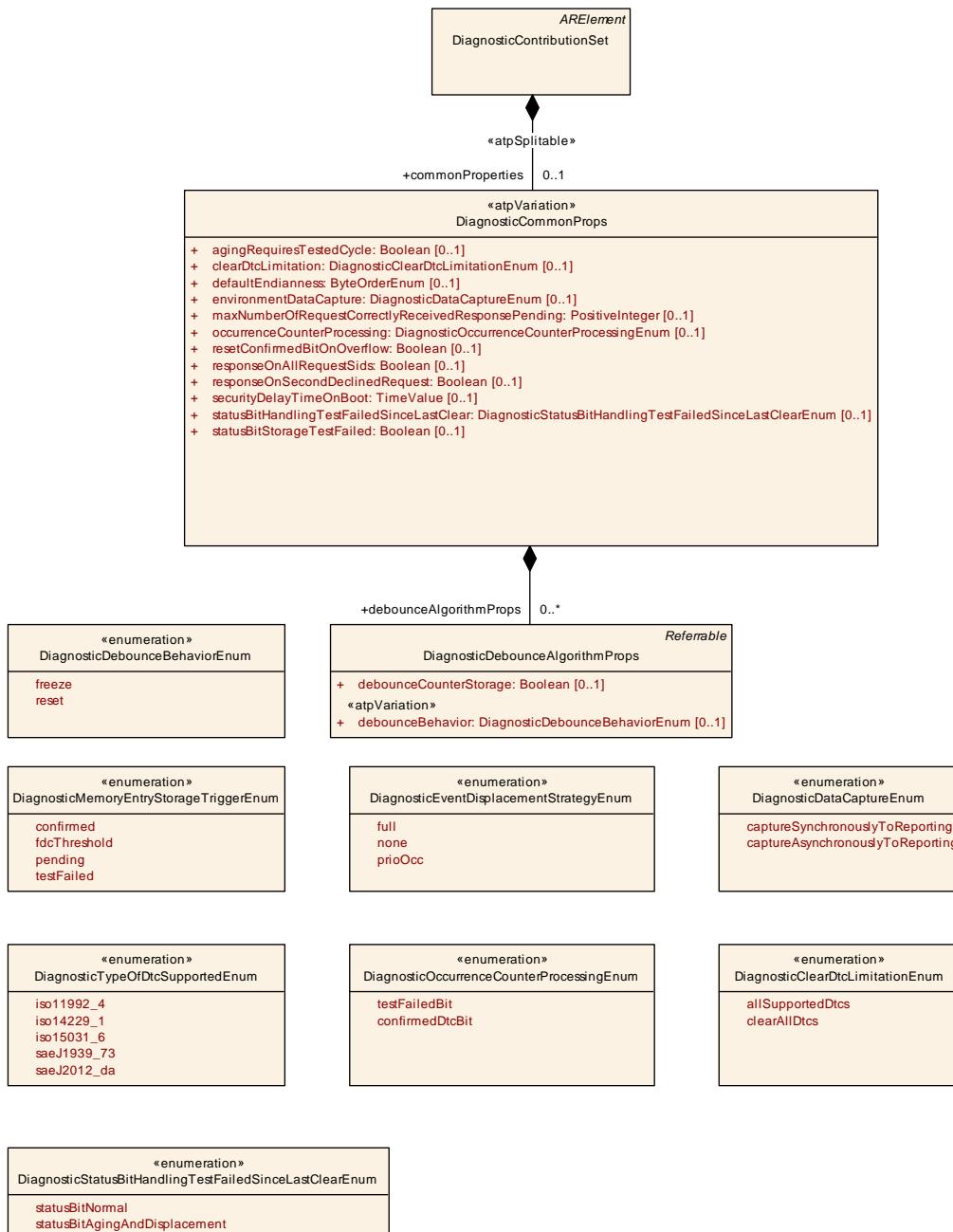


Figure 4.7: Modeling of DiagnosticConnection

4.6 Diagnostic Common Properties

[TPS_DEXT_01007] Common properties of a DiagnosticExtract [There are some properties of a [DiagnosticExtract](#) that are shared among all elements of the [DiagnosticExtract](#). These properties are modeled by means of the meta-class [DiagnosticCommonProps.](#).] ([RS_DEXT_00001](#))


Figure 4.8: Common Diagnostic Properties

[TPS_DEXT_01008] **DiagnosticContributionSet** defines the scope for the application of the common diagnostic properties [DiagnosticContributionSet aggregates DiagnosticCommonProps and by this means defines the scope for the application of the common diagnostic properties.] (RS_DEXT_00001)

Class	<<atpVariation>> DiagnosticCommonProps			
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticCommonProps			
Note	This meta-class aggregates a number of common properties that are shared among a diagnostic extract. Tags: vh.latestBindingTime=codeGenerationTime			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
agingRequiresTestedCycle	Boolean	0..1	attr	<p>Defines whether the aging cycle counter is processed every aging cycles or else only tested aging cycle are considered.</p> <p>If the attribute is set to TRUE: only tested aging cycle are considered for aging cycle counter.</p> <p>If the attribute is set to FALSE: aging cycle counter is processed every aging cycle.</p>
clearDtcLimitation	DiagnosticClearDtcLimitationEnum	0..1	attr	Defines the scope of the DEM_ClearDTC Api.
debounceAlgorithmProps	DiagnosticDebounceAlgorithmProps	*	aggr	Defines the used debounce algorithms relevant in the context of the enclosing DiagnosticCommonProps. Usually, there is a variety of debouncing algorithms to take into account and therefore the multiplicity of this aggregation is set to 0..*.
defaultEndianness	ByteOrderEnum	0..1	attr	Defines the default endianness of the data belonging to a DID or RID which is applicable if the DiagnosticData Element does not define the endianness via the swDataDefProps.baseType attribute.
environmentDataCapture	DiagnosticDataCaptureEnum	0..1	attr	This attribute determines whether the capturing of environment data is done synchronously inside the report API function or whether the capturing shall be done asynchronously, i.e. after the report API function already terminated.
maxNumberOfRequestCorrectlyReceivedResponsePending	PositiveInteger	0..1	attr	Maximum number of negative responses with response code 0x78 (requestCorrectlyReceived-ResponsePending) allowed per request. DCM will send a negative response with response code 0x10 (generalReject), in case the limit value gets reached. Value 0xFF means that no limit number of NRC 0x78 response apply.
occurrenceCounterProcessing	DiagnosticOccurrenceCounterProcessingEnum	0..1	attr	This attribute defines the consideration of the fault confirmation process for the occurrence counter.
resetConfirmedBitOnOverflow	Boolean	0..1	attr	This attribute defines, whether the confirmed bit is reset or not while an event memory entry will be displaced.
responseOnAllRequestSids	Boolean	0..1	attr	If set to FALSE the DCM will not respond to diagnostic request that contains a service ID which is in the range from 0x40 to 0x7F or in the range from 0xC0 to 0xFF (Response IDs).
responseOnSecondDeclinedRequest	Boolean	0..1	attr	<p>Defines the reaction upon a second request (ClientB) that can not be processed (e.g. due to priority assessment).</p> <p>TRUE: when the second request (Client B) can not be processed, it shall be answered with NRC21 BusyRepeat Request.</p> <p>FALSE: when the second request (Client B) can not be processed, it shall not be responded.</p>
securityDelayTimeOnBoot	TimeValue	0..1	attr	<p>Start delay timer on power on in seconds.</p> <p>This delay indicates the time at ECU boot power-on time where the Dcm remains in the default session and does not accept a security access.</p>





Class	<>atpVariation>> DiagnosticCommonProps			
statusBit HandlingTest FailedSinceLast Clear	DiagnosticStatusBit HandlingTestFailed SinceLastClearEnum	0..1	attr	This attribute defines, whether the aging and displacement mechanism shall be applied to the "Test FailedSinceLastClear" status bits.
statusBit StorageTest Failed	Boolean	0..1	attr	This parameter is used to activate/deactivate the permanent storage of the "TestFailed" status bits. true: storage activated false: storage deactivated

Table 4.17: DiagnosticCommonProps

Enumeration	DiagnosticMemoryEntryStorageTriggerEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	Trigger types to allocate an event memory entry.
Literal	Description
confirmed	Status information of UDS DTC status bit 3 Tags: atp.EnumerationLiteralIndex=0
fdcThreshold	Threshold to allocate an event memory entry and to capture the Freeze Frame. Tags: atp.EnumerationLiteralIndex=1
pending	Status information of UDS DTC status bit 2. Tags: atp.EnumerationLiteralIndex=2
testFailed	Status information of UDS DTC status bit 0. Tags: atp.EnumerationLiteralIndex=3

Table 4.18: DiagnosticMemoryEntryStorageTriggerEnum

Enumeration	DiagnosticDataCaptureEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticCommonProps
Note	Data triggering types
Literal	Description
capture AsynchronouslyTo Reporting	This represents the intention to capture the environment data asynchronously after the actual capture API function terminated. Tags: atp.EnumerationLiteralIndex=0
capture SynchronouslyTo Reporting	This represents the intention to capture the environment data synchronously within the capture API function. Tags: atp.EnumerationLiteralIndex=1

Table 4.19: DiagnosticDataCaptureEnum

Enumeration	DiagnosticClearDtcLimitationEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticCommonProps
Note	Scope of the DEM_ClearDTC Api.
Literal	Description





Enumeration	DiagnosticClearDtcLimitationEnum
allSupportedDtc	DEM_ClearDtc API accepts all supported DTC values. Tags: atp.EnumerationLiteralIndex=0
clearAllDtc	DEM_ClearDtc API accepts ClearAllDTCs only. Tags: atp.EnumerationLiteralIndex=1

Table 4.20: DiagnosticClearDtcLimitationEnum

Enumeration	DiagnosticEventDisplacementStrategyEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	Defines the displacement strategy.
Literal	Description
full	Event memory entry displacement is enabled, by consideration of priority active/passive status, and occurrence. Tags: atp.EnumerationLiteralIndex=0
none	Event memory entry displacement is disabled. Tags: atp.EnumerationLiteralIndex=1
prioOcc	Event memory entry displacement is enabled, by consideration of priority and occurrence (but without active/passive status). Tags: atp.EnumerationLiteralIndex=2

Table 4.21: DiagnosticEventDisplacementStrategyEnum

Enumeration	DiagnosticOccurrenceCounterProcessingEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticCommonProps
Note	The occurrence counter triggering types.
Literal	Description
confirmedDtcBit	The occurrence counter is triggered by the TestFailed bit if the fault confirmation was successful (ConfirmedDTC bit is set). Tags: atp.EnumerationLiteralIndex=0
testFailedBit	The occurrence counter is only triggered by the TestFailed bit (and the fault confirmation is not considered). Tags: atp.EnumerationLiteralIndex=1

Table 4.22: DiagnosticOccurrenceCounterProcessingEnum

Enumeration	DiagnosticTypeOfDtcSupportedEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	Supported Dtc Types
Literal	Description
iso11992_4	ISO11992-4 DTC format Tags: atp.EnumerationLiteralIndex=0
iso14229_1	ISO14229-1 DTC format (3 byte format) Tags: atp.EnumerationLiteralIndex=1



△

Enumeration	DiagnosticTypeOfDtcSupportedEnum
iso15031_6	ISO15031-6 DTC format (2 byte format) Tags: atp.EnumerationLiteralIndex=2
saeJ1939_73	SAEJ1939-73 DTC format Tags: atp.EnumerationLiteralIndex=3
saeJ2012_da	SAE_J2012-DA_DTCFormat_00 (3 byte format) Tags: atp.EnumerationLiteralIndex=4

Table 4.23: DiagnosticTypeOfDtcSupportedEnum

5 Diagnostic Services

5.1 Introduction

The meta-model for the diagnostic services according to AUTOSAR, to a large degree, takes over aspects of the description of diagnostic services according to the definition of *Unified Diagnostic Services* (UDS) as of ISO 14229 [16].

5.2 Service Instance vs. Service Class

When it comes to diagnostic services, the meta-model distinguishes between the concept of a diagnostic service *instance* vs. the concept of a diagnostic service *class*.

As the terminology suggests, the diagnostic service *instance* (formalized as `DiagnosticServiceInstance`) implements a concrete use of a diagnostic service in a given context whereas purpose of the diagnostic service *class* (formalized as `DiagnosticServiceClass`) is to provide properties that are shared among all existing diagnostic service *instances* in the model.

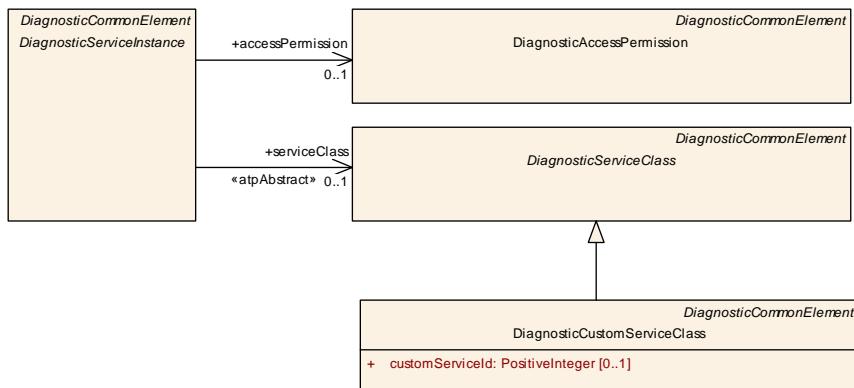


Figure 5.1: Common service elements

[constr_1329] Existence of concrete sub-classes of `DiagnosticServiceClass` in the context created by a `DiagnosticContributionSet` [One of the following mutually exclusive conditions shall apply for the existence of any concrete sub-class of `DiagnosticServiceClass` in the context created by a `DiagnosticContributionSet`:

- The subclass of `DiagnosticServiceClass` shall only appear once in the context created by a `DiagnosticContributionSet`
- If the subclass of `DiagnosticServiceClass` appears multiple times in the context created by a `DiagnosticContributionSet` then all instances shall have identical values for all of their attributes.

In case of aggregations the number of aggregated elements shall be identical and the values of primitive attributes of aggregated elements shall again be identical.

]()

The background of [constr_1329] is obviously related to the semantics of `DiagnosticServiceClass` which is to define model attributes that are shared among all `DiagnosticServiceInstances`.

This would not be possible if more than one `DiagnosticServiceClass` with a diverging set of attribute values exists.

Class	<code>DiagnosticServiceClass</code> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommonService			
Note	This meta-class provides the ability to define common properties that are shared among all instances of sub-classes of <code>DiagnosticServiceInstance</code> .			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Subclasses	DiagnosticClearDiagnosticInformationClass, DiagnosticClearResetEmissionRelatedInfoClass, DiagnosticComControlClass, DiagnosticControlDTCSettingClass, DiagnosticCustomServiceClass, DiagnosticDataTransferClass, DiagnosticDynamicallyDefineDataIdentifierClass, DiagnosticEcuResetClass, DiagnosticIOControlClass, DiagnosticReadDTCInformationClass, DiagnosticReadDataByIdentifierClass, DiagnosticReadDataByPeriodicIDClass, DiagnosticReadMemoryByAddressClass, DiagnosticReadScalingDataByIdentifierClass, DiagnosticRequestControlOfOnBoardDeviceClass, DiagnosticRequestCurrentPowertrainDataClass, DiagnosticRequestDownloadClass, DiagnosticRequestEmissionRelatedDTCClass, DiagnosticRequestEmissionRelatedDTCPermanentStatusClass, DiagnosticRequestFileTransferClass, DiagnosticRequestOnBoardMonitoringTestResultsClass, DiagnosticRequestPowertrainFreezeFrameDataClass, DiagnosticRequestUploadClass, DiagnosticRequestVehicleInfoClass, DiagnosticResponseOnEventClass, DiagnosticRoutineControlClass, DiagnosticSecurityAccessClass, DiagnosticSessionControlClass, DiagnosticTransferExitClass, DiagnosticWriteDataByIdentifierClass, DiagnosticWriteMemoryByAddressClass			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.1: DiagnosticServiceClass

Class	<code>DiagnosticServiceInstance</code> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommonService			
Note	This represents a concrete instance of a diagnostic service.			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Subclasses	DiagnosticClearDiagnosticInformation, DiagnosticClearResetEmissionRelatedInfo, DiagnosticComControl, DiagnosticControlDTCSetting, DiagnosticCustomServiceInstance, <code>DiagnosticDataByIdentifier</code> , DiagnosticDynamicallyDefineDataIdentifier, DiagnosticEcuReset, DiagnosticIOControl, <code>DiagnosticMemoryByAddress</code> , DiagnosticReadDTCInformation, DiagnosticReadDataByPeriodicID, DiagnosticRequestControlOfOnBoardDevice, DiagnosticRequestCurrentPowertrainData, DiagnosticRequestEmissionRelatedDTC, DiagnosticRequestEmissionRelatedDTCPermanentStatus, DiagnosticRequestFileTransfer, DiagnosticRequestOnBoardMonitoringTestResults, DiagnosticRequestPowertrainFreezeFrameData, DiagnosticRequestVehicleInfo, DiagnosticResponseOnEvent, DiagnosticRoutineControl, DiagnosticSecurityAccess, DiagnosticSessionControl			
Attribute	Type	Mult.	Kind	Note
access Permission	<code>DiagnosticAccessPermission</code>	0..1	ref	This represents the collection of <code>DiagnosticAccessPermissions</code> that allow for the execution of the referencing <code>DiagnosticServiceInstance</code> ..

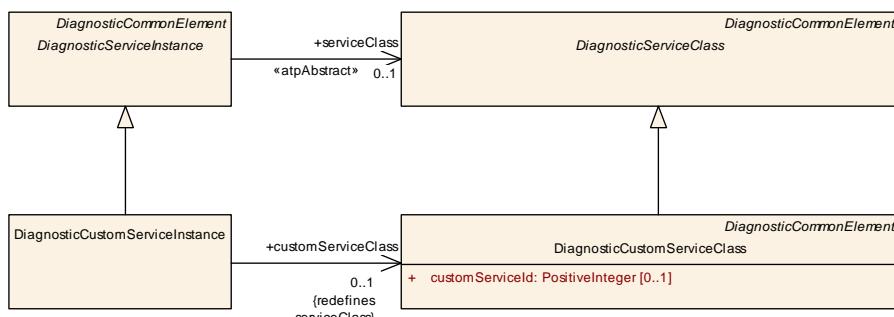


Class	<i>DiagnosticServiceInstance</i> (abstract)			
serviceClass	<i>DiagnosticServiceClass</i>	0..1	ref	<p>This represents the corresponding "class", i.e. this meta-class provides properties that are shared among all instances of applicable sub-classes of <i>DiagnosticServiceInstance</i>.</p> <p>The subclasses that affected by this pattern implement references to the applicable "class"-role that substantiate this abstract reference.</p> <p>Stereotypes: atpAbstract</p>

Table 5.2: DiagnosticServiceInstance

[constr_1798] Existence of *DiagnosticServiceInstance.serviceClass* [For each subclass of *DiagnosticServiceInstance*, a reference with the abstract role *serviceClass* shall exist **at the time when the DEXT is complete** to a matching subclass of *DiagnosticServiceClass*.]

This rule applies unless a rule for a specific combination of matching sub-classes of *DiagnosticServiceInstance* and *DiagnosticServiceClass* exists.]()


Figure 5.2: Modeling of custom service instance

[TPS_DEXT_01147] Support for custom service instance [Meta-class *DiagnosticCustomServiceInstance* can be used to define the existence of an instance of a custom diagnostic service.] ([RS_DEXT_00047](#))

Custom services can obviously not be configured using standardized attributes, but there is the ability to use *Sdg* in the context of *adminData* for this purpose.

There is no obligation for a given tool to be able to properly process the definition of the custom service instance.

Class	<i>DiagnosticCustomServiceInstance</i>
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CustomServiceInstance
Note	This meta-class has the ability to define an instance of a custom diagnostic service. Tags: atp.recommendedPackage=DiagnosticCustomInstances
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceInstance</i> , <i>Identifiable</i> , <i>MultilanguageReferable</i> , <i>PackageableElement</i> , <i>Referable</i>



Class	DiagnosticCustomServiceInstance			
Attribute	Type	Mult.	Kind	Note
customService Class	DiagnosticCustom ServiceClass	0..1	ref	Reference to the corresponding DiagnosticCustom ServiceClass.

Table 5.3: DiagnosticCustomServiceInstance

[constr_1330] Custom service identifier shall not overlap with standardized service identifiers [The value of the attribute `customServiceId` shall not be set to any of the values reserved for standardized service identifiers as defined by the ISO 14229-1, see [16].]()

Class	DiagnosticCustomServiceClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommonService			
Note	This represents the ability to define a custom diagnostic service class and assign an ID to it. Further configuration is not foreseen from the point of view of the diagnostic extract and consequently needs to be done on the level of ECUC. Tags: atp.recommendedPackage=DiagnosticCustomServiceClasses			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
customService Id	PositiveInteger	0..1	attr	This attribute may only be used for the definition of custom services. The values shall not overlap with existing standardized service IDs.

Table 5.4: DiagnosticCustomServiceClass

5.3 Access Permission, Session, Security Level

This chapter discusses a set of meta-classes that have been created to represent the concept of an *access permission* used in the context of the Dcm.

5.3.1 Introduction to Access Permission

The `DiagnosticAccessPermission` is used to describe the ability (or the lack thereof) to execute a diagnostic service depending on the referenced `DiagnosticSecurityLevel` and `DiagnosticSession` (see Figure 5.3).

At runtime, `DiagnosticSessions` are used to create a context for the execution of diagnostic functionality. Servers usually support a variety of different `DiagnosticSessions`. It is possible to switch between `DiagnosticSessions` at runtime.

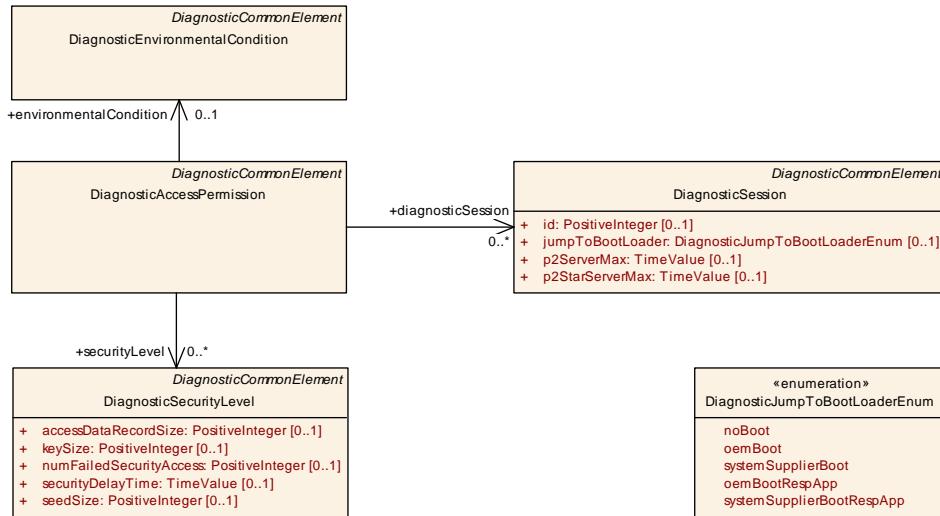


Figure 5.3: Common model elements relevant for the Dcm

[TPS_DEXT_01139] Semantics of the references from **DiagnosticAccessPermission** [The semantics of the references from **DiagnosticAccessPermission** to

- **DiagnosticSession** in the role **diagnosticSession**
- **DiagnosticSecurityLevel** in the role **securityLevel**
- **DiagnosticEnvironmentalCondition** in the role **environmentalCondition**

in terms of how access permission is granted is subject to the specification of the Dcm [10].] ([RS_DEXT_00040](#))

[TPS_DEXT_01011] Semantics of **DiagnosticSession.id** [The value of the attribute **DiagnosticSession.id** has a given semantics according to ISO 14229-1 [16]. For the sake of completeness, the dedicated values of **DiagnosticSession.id** are:

0x01 This represents the *default session*. This session has a specific semantics in the context of diagnostics communication such that e.g. any diagnostic service that is supposed to execute in the *default session* cannot require any reference to a **DiagnosticSecurityLevel**.

0x02 This represents the *programming session*.

0x03 This represents the *extended diagnostic session*.

0x04 This represents the *safety system diagnostic session*.

The value range **0x40 .. 0x5F** is reserved for manufacturer-specific use.] ([RS_DEXT_00040](#))

Class	DiagnosticSecurityLevel			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm			
Note	This meta-class represents the ability to define a security level considered for diagnostic purposes. Tags: atp.recommendedPackage=DiagnosticSecurityLevels			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
accessDataRecordSize	PositiveInteger	0..1	attr	This represents the size of the AccessDataRecord used in GetSeed. Unit: byte.
keySize	PositiveInteger	0..1	attr	This represents the size of the security key. Unit: byte.
numFailedSecurityAccess	PositiveInteger	0..1	attr	This represents the number of failed security accesses after which the delay time is activated.
securityDelayTime	TimeValue	0..1	attr	This represents the delay time after a failed security access. Unit: second.
seedSize	PositiveInteger	0..1	attr	This represents the size of the security seed. Unit: byte.

Table 5.5: DiagnosticSecurityLevel

[TPS_DEXT_01012] Rationale for the modeling of the multiplicity of *DiagnosticAccessPermission.securityLevel* [The multiplicity of *DiagnosticAccessPermission.securityLevel* has been set to 0..* with the following motivation:

- The *DiagnosticSession* where the attribute *DiagnosticSession.id* is set to 0x01 shall **not** be associated with a *DiagnosticSecurityLevel*.
- There are no associated *DiagnosticSecurityLevel*s required. As a consequence, the execution of the *DiagnosticServiceInstance* that references the given *DiagnosticAccessPermission* is always possible.

] (RS_DEXT_00041, RS_DEXT_00042)

[TPS_DEXT_01070] Description of textually semi-formal formulated pre- and run-conditions for the validity of *DiagnosticAccessPermission* [AUTOSAR supports the description of textually formulated semi-formal pre- and run-conditions for the validity of *DiagnosticAccessPermission*.

This can be done by means of the attribute *DiagnosticAccessPermission.introduction.structuredReq*.] ()

For more details regarding the modeling of the semi-formal text please refer to Figure 4.3. An example of how the definition of pre- and run-conditions may look like in ARXML is sketched in listing 5.1.

To make this approach work it is important to standardize possible values of the attribute *category* such that the semi-formal semantics of the definition of pre- and run-conditions is protected by regulation of the AUTOSAR standard.

[TPS_DEXT_01071] Standardized values of *DiagnosticAccessPermission.introduction.structuredReq* [The following possible values of *DiagnosticAccessPermission.introduction.structuredReq* are standardized by AUTOSAR:

- **DIAG_ACCESS_PERM_PRE_COND**: this value describes the pre-condition of the corresponding [DiagnosticAccessPermission](#).
- **DIAG_ACCESS_PERM_RUN_COND**: this value describes the run-condition of the corresponding [DiagnosticAccessPermission](#).

]([RS_DEXT_00041](#), [RS_DEXT_00045](#))

Listing 5.1: Example for the definition of pre- and run-conditions for [DiagnosticAccessPermission](#)

```
<DIAGNOSTIC-ACCESS-PERMISSION>
  <SHORT-NAME>exampleAccessPermission</SHORT-NAME>
  <INTRODUCTION>
    <STRUCTURED-REQ>
      <SHORT-NAME>precondition</SHORT-NAME>
      <CATEGORY>DIAG_ACCESS_PERM_PRE_COND</CATEGORY>
      <DESCRIPTION>
        <P>
          <L-1 L="EN">This is a textual description of a pre-
          condition</L-1>
        </P>
      </DESCRIPTION>
    </STRUCTURED-REQ>
    <STRUCTURED-REQ>
      <SHORT-NAME>runcondition</SHORT-NAME>
      <CATEGORY>DIAG_ACCESS_PERM_RUN_COND</CATEGORY>
      <DESCRIPTION>
        <P>
          <L-1 L="EN">This is a textual description of a run-
          condition</L-1>
        </P>
      </DESCRIPTION>
    </STRUCTURED-REQ>
  </INTRODUCTION>
  <DIAGNOSTIC-SESSION-REFS>
    <DIAGNOSTIC-SESSION-REF DEST="DIAGNOSTIC-SESSION">/AUTOSAR/
      UseCase_230/ExampleSession</DIAGNOSTIC-SESSION-REF>
  </DIAGNOSTIC-SESSION-REFS>
  <SECURITY-LEVEL-REFS>
    <SECURITY-LEVEL-REF DEST="DIAGNOSTIC-SECURITY-LEVEL">/AUTOSAR/
      UseCase_230/ExampleSecurityLevel</SECURITY-LEVEL-REF>
  </SECURITY-LEVEL-REFS>
</DIAGNOSTIC-ACCESS-PERMISSION>
```

[constr_1419] Value of [DiagnosticSecurityLevel.accessDataRecordSize](#)
[If the attribute [DiagnosticSecurityLevel.accessDataRecordSize](#) exists then its value shall be greater than zero.]()

Class	DiagnosticAccessPermission			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm			
Note	<p>This represents the specification of whether a given service can be accessed according to the existence of meta-classes referenced by a particular DiagnosticAccessPermission.</p> <p>In other words, this meta-class acts as a mapping element between several (otherwise unrelated) pieces of information that are put into context for the purpose of checking for access rights.</p> <p>Tags:atp.recommendedPackage=DiagnosticAccessPermissions</p>			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnostic Session	DiagnosticSession	*	ref	This represents the associated DiagnosticSessions
environmental Condition	Diagnostic EnvironmentalCondition	0..1	ref	This represents the environmental conditions associated with the access permission.
securityLevel	DiagnosticSecurityLevel	*	ref	This represents the associated DiagnosticSecurityLevels

Table 5.6: DiagnosticAccessPermission

Class	DiagnosticSession			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm			
Note	<p>This meta-class represents the ability to define a diagnostic session.</p> <p>Tags:atp.recommendedPackage=DiagnosticSessions</p>			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	This is the numerical identifier used to identify the DiagnosticSession in the scope of diagnostic workflow
jumpToBoot Loader	DiagnosticJumpToBoot LoaderEnum	0..1	attr	<p>This attribute represents the ability to define whether this diagnostic session allows to jump to Bootloader (OEM Bootloader or System Supplier Bootloader).</p> <p>If this diagnostic session doesn't allow to jump to Bootloader the value JumpToBootLoaderEnum.noBoot shall be chosen.</p>
p2ServerMax	TimeValue	0..1	attr	<p>This is the session value for P2ServerMax in seconds (per Session Control).</p> <p>The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.</p>
p2StarServer Max	TimeValue	0..1	attr	<p>This is the session value for P2*ServerMax in seconds (per Session Control).</p> <p>The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.</p>

Table 5.7: DiagnosticSession

Enumeration	DiagnosticJumpToBootLoaderEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm
Note	This enumeration contains the options for jumping to a boot loader.
Literal	Description





<i>Enumeration</i>	DiagnosticJumpToBootLoaderEnum
noBoot	This diagnostic session doesn't allow to jump to Bootloader. Tags: atp.EnumerationLiteralIndex=0
oemBoot	This diagnostic session allows to jump to OEM Bootloader. In this case the bootloader send the final response. Tags: atp.EnumerationLiteralIndex=1
oemBootRespApp	This diagnostic session allows to jump to OEM Bootloader and application sends final response. Tags: atp.EnumerationLiteralIndex=3
systemSupplierBoot	This diagnostic session allows to jump to System Supplier Bootloader. In this case the bootloader send the final response. Tags: atp.EnumerationLiteralIndex=2
systemSupplierBoot RespApp	This diagnostic session allows to jump to System Supplier Bootloader and application sends final response. Tags: atp.EnumerationLiteralIndex=4

Table 5.8: DiagnosticJumpToBootLoaderEnum

5.4 Environmental Conditions for the Execution of Diagnostic Services

In some cases, diagnostic functionality can only be executed if the vehicle is in a (safe) state that allows for the respective diagnostics function. For example, one such condition is that the vehicle is not driving, i.e. vehicle speed == 0.

The meta-class [DiagnosticEnvironmentalCondition](#) formalizes the idea of a condition which is evaluated during runtime of the ECU by looking at “environmental” states (such as the mentioned vehicle speed).

[DiagnosticEnvironmentalConditions](#) are based on the active modes in the application software or basic software or by comparison of [DiagnosticDataElement](#)s with constant values. Atomic conditions can be combined by logical operations to form more complex conditions.

Please note that it is possible to create a nested hierarchy (of arbitrary depth) of [DiagnosticEnvConditionFormula](#). This modeling is supported by the fact that [DiagnosticEnvConditionFormula](#) inherits from and, at the same time, aggregates [DiagnosticEnvConditionFormulaPart](#).

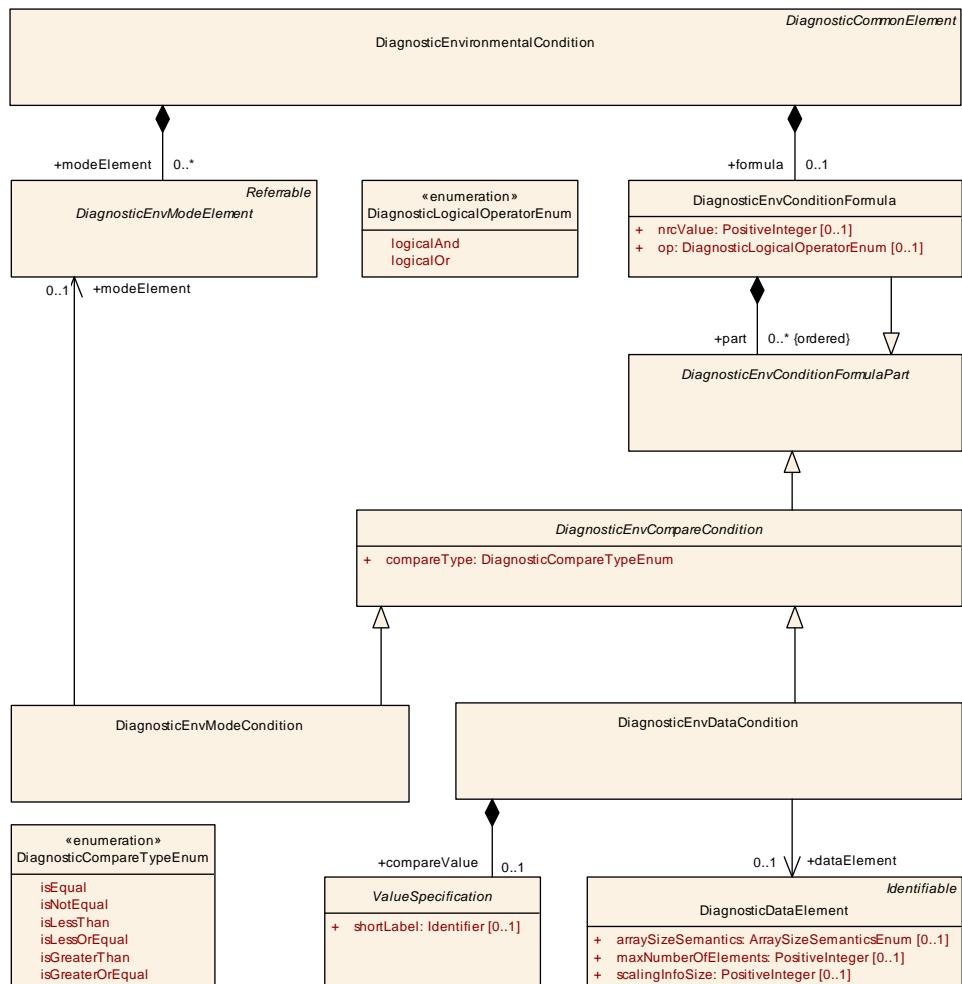


Figure 5.4: Formal modeling of the consideration of environmental conditions

Class	DiagnosticEnvironmentalCondition			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	The meta-class DiagnosticEnvironmentalCondition formalizes the idea of a condition which is evaluated during runtime of the ECU by looking at "environmental" states (e.g. one such condition is that the vehicle is not driving, i.e. vehicle speed == 0). Tags: atp.recommendedPackage=DiagnosticEnvironmentalConditions			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>Identifiable</i> , <i>Multilanguage</i> , <i>Referrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
formula	DiagnosticEnvConditionFormula	0..1	aggr	This attribute represents the formula part of the DiagnosticEnvironmentalCondition.
modeElement	DiagnosticEnvModeElement	*	aggr	This aggregation contains a representation of Mode Declarations in the context of a DiagnosticEnvironmentalCondition.

Table 5.9: DiagnosticEnvironmentalCondition

[constr_1799] Existence of *DiagnosticEnvironmentalCondition.formula*
 「For each *DiagnosticEnvironmentalCondition*, the aggregation of *DiagnosticEnvConditionFormula* in the role *formula* shall exist **at the time when the DEXT is complete.**」()

5.4.1 Environmental Condition Formula

The core part of a [DiagnosticEnvironmentalCondition](#) is the [DiagnosticEnvConditionFormula](#).

Class	DiagnosticEnvConditionFormula			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	<p>A DiagnosticEnvConditionFormula embodies the computation instruction that is to be evaluated at runtime to determine if the DiagnosticEnvironmentalCondition is currently present (i.e. the formula is evaluated to true) or not (otherwise). The formula itself consists of parts which are combined by the logical operations specified by DiagnosticEnvConditionFormula.op.</p> <p>If a diagnostic functionality cannot be executed because an environmental condition fails then the diagnostic stack shall send a negative response code (NRC) back to the client. The value of the NRC is directly related to the specific formula and is therefore formalized in the attribute DiagnosticEnvConditionFormula.nrcValue.</p>			
Base	ARObject , DiagnosticEnvConditionFormulaPart			
Attribute	Type	Mult.	Kind	Note
nrcValue	PositiveInteger	0..1	attr	This attribute represents the concrete NRC value that shall be returned if the condition fails.
op	DiagnosticLogicalOperatorEnum	0..1	attr	This attribute represents the concrete operator (supported operators: and, or) of the condition formula.
part (ordered)	DiagnosticEnvConditionFormulaPart	*	aggr	This aggregation represents the collection of formula parts that can be combined by logical operators.

Table 5.10: DiagnosticEnvConditionFormula

[constr_1800] Existence of [DiagnosticEnvConditionFormula.op](#) [For each [DiagnosticEnvConditionFormula](#), that attribute [op](#) shall exist **at the time when the DEXT is complete.**]()

Enumeration	DiagnosticLogicalOperatorEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition
Note	Logical AND and OR operation (&&,)
Literal	Description
logicalAnd	Logical AND Tags: atp.EnumerationLiteralIndex=0
logicalOr	Logical OR Tags: atp.EnumerationLiteralIndex=1

Table 5.11: DiagnosticLogicalOperatorEnum

[TPS_DEXT_01113] Evaluation of a [DiagnosticEnvConditionFormula](#) [A [DiagnosticEnvConditionFormula](#) embodies the computation instruction that is to be evaluated at runtime to determine if the [DiagnosticEnvironmentalCondition](#) is currently present (i.e. the formula is evaluated to true) or not (otherwise).]

The [DiagnosticEnvConditionFormula](#) itself consists of [parts](#) which are combined by the logical operations represented by the attribute [op](#).] ([RS_DEXT_00079](#))

Class	<i>DiagnosticEnvConditionFormulaPart</i> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	A <i>DiagnosticEnvConditionFormulaPart</i> can either be a atomic condition, e.g. a <i>DiagnosticEnvCompareCondition</i> , or a <i>DiagnosticEnvConditionFormula</i> , again, which allows arbitrary nesting.			
Base	<i>ARObject</i>			
Subclasses	<i>DiagnosticEnvCompareCondition</i> , <i>DiagnosticEnvConditionFormula</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.12: *DiagnosticEnvConditionFormulaPart*

[TPS_DEXT_01114] *DiagnosticEnvConditionFormula* that has no parts [A *DiagnosticEnvConditionFormula* that has no parts shall be evaluated to false. This rule shall apply independently of the value of *DiagnosticEnvConditionFormula.op.*.] (*RS_DEXT_00079*)

[TPS_DEXT_01115] *DiagnosticEnvConditionFormula* that has one part [A *DiagnosticEnvConditionFormula* that has one part shall be evaluated to the evaluation result of this part. This rule shall apply independently of the value of *DiagnosticEnvConditionFormula.op.*.] (*RS_DEXT_00079*)

[TPS_DEXT_01116] *DiagnosticEnvConditionFormula* that has more than one part [The evaluation result of a *DiagnosticEnvConditionFormula* with more than one part shall be calculated by combining the results of the parts with the logical Operation specified by *DiagnosticEnvConditionFormula.op.*.

The evaluation shall be done in a “short-cut” manner, i.e. following the rules for the evaluation of the logical operators in C.

The consequences of this approach are:

- The parts shall be evaluated in the specified order starting at the first element. This is why the aggregation of part is decorated by the ordered qualifier.
- after the evaluation of each part a check shall be executed if it is still possible that the evaluation of the remaining parts (to true or false) could change the overall result.
- As soon as a change of the overall result is no longer possible, i.e. any of the following conditions evaluates to false:
 - there are no parts left
 - the current part was evaluated to false and *DiagnosticEnvConditionFormula.op == DiagnosticLogicalOperatorEnum.logicalAnd*
 - the current part was evaluated to true and *DiagnosticEnvConditionFormula.op == DiagnosticLogicalOperatorEnum.logicalOr*

the evaluation of the parts shall be finalized and the evaluation result of the current part shall be considered the overall evaluation result of the formula.

Regarding the strategy for returning NRC values please refer to the specification of the SWS Dcm [10].

]([RS_DEXT_00079](#))

[TPS_DEXT_01117] Semantics of `DiagnosticEnvConditionFormula.nrcValue` [If a diagnostic functionality cannot be executed because an environmental condition fails, i.e. the formula is evaluated to false, then the diagnostic stack shall send an optional negative response code (NRC) back to the client (if it is present).]

If no value for NRC is defined then a pre-defined NRC value as defined in the SWS Dcm [10] will be sent back. The value of the NRC is directly related to the specific `DiagnosticEnvConditionFormula` and is therefore formalized in the attribute `DiagnosticEnvConditionFormula.nrcValue`.]([RS_DEXT_00079](#))

[constr_1464] Allowed value range of `DiagnosticEnvConditionFormula.nrcValue` [The value of attribute `DiagnosticEnvConditionFormula.nrcValue` shall be limited to the interval [1..255].]([\(\)](#))

The rationale for the existence of [constr_1464] is provided by ISO 14229-1 [16].

5.4.2 Atomic Conditions

Atomic conditions in the context of a `DiagnosticEnvConditionFormula` are described by means of meta-class `DiagnosticEnvCompareConditions`. The formulation of `DiagnosticEnvCompareConditions` is based on the idea of a comparison at runtime of some variable data with a constant value.

The actual type of the comparison (==, !=, <, <=, ...) is specified by means of the attribute `DiagnosticEnvCompareCondition.compareType`.

Class	<i>DiagnosticEnvCompareCondition</i> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	DiagnosticCompareConditions are atomic conditions. They are based on the idea of a comparison at runtime of some variable data with something constant. The type of the comparison (==, !=, <, <=, ...) is specified in <code>DiagnosticCompareCondition.compareType</code> .			
Base	ARObject, <i>DiagnosticEnvConditionFormulaPart</i>			
Subclasses	<i>DiagnosticEnvDataCondition</i> , <i>DiagnosticEnvModeCondition</i>			
Attribute	Type	Mult.	Kind	Note
compareType	<code>DiagnosticCompareTypeEnum</code>	1	attr	This attribute represents the concrete type of the comparison.

Table 5.13: `DiagnosticEnvCompareCondition`

[constr_1801] Existence of `DiagnosticEnvCompareCondition.compareType` [For each `DiagnosticEnvCompareCondition`, that attribute `compareType` shall exist **at the time when the DEXT is complete**.]([\(\)](#))

Enumeration	DiagnosticCompareTypeEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition
Note	Enumeration for the type of a comparison of values usually expressed by the following operators: ==, !=, <, <=, >, >=
Literal	Description
isEqual	equal Tags: atp.EnumerationLiteralIndex=0
isGreaterOrEqual	greater than or equal Tags: atp.EnumerationLiteralIndex=5
isGreaterThan	greater than Tags: atp.EnumerationLiteralIndex=4
isLessOrEqual	less than or equal Tags: atp.EnumerationLiteralIndex=3
isLessThan	less than Tags: atp.EnumerationLiteralIndex=2
isNotEqual	not equal Tags: atp.EnumerationLiteralIndex=1

Table 5.14: DiagnosticCompareTypeEnum

[DiagnosticEnvCompareCondition](#) is an abstract meta-class that acts as a base class for two concrete meta-classes designed to handle different operand types.

The specific sub-classes (the details are explained in sections [5.4.2.1](#) and [5.4.2.2](#)) of [DiagnosticEnvCompareCondition](#) support a different set of attributes of [DiagnosticCompareTypeEnum](#) for setting the value of attribute [compareType](#).

5.4.2.1 Data Condition

[TPS_DEXT_01118] Semantics of [DiagnosticEnvDataCondition](#) [The meta-class [DiagnosticEnvDataCondition](#) represents an atomic condition that compares the current value of the referenced [DiagnosticDataElement](#) with a constant value defined by the [ValueSpecification](#) aggregated in the role [compareValue](#).] ([RS_DEXT_00079](#))

[constr_1465] Allowed values of [compareType](#) in the context of a [DiagnosticEnvDataCondition](#) [Within the context of a [DiagnosticEnvDataCondition](#) **all values** of [DiagnosticCompareTypeEnum](#) are supported for the inherited attribute [compareType](#).]()

Class	DiagnosticEnvDataCondition			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	A DiagnosticEnvDataCondition is an atomic condition that compares the current value of the referenced DiagnosticDataElement with a constant value defined by the ValueSpecification. All compareTypes are supported.			
Base	ARObject, <i>DiagnosticEnvCompareCondition</i> , <i>DiagnosticEnvConditionFormulaPart</i>			
Attribute	Type	Mult.	Kind	Note
compareValue	ValueSpecification	0..1	aggr	This attribute represents a fixed compare value taken to evaluate the compare condition.
dataElement	DiagnosticDataElement	0..1	ref	This reference represents the related diagnostic data element.

Table 5.15: DiagnosticEnvDataCondition

[constr_1802] Existence of *DiagnosticEnvDataCondition.compareValue* [For each *DiagnosticEnvDataCondition*, that attribute *compareValue* shall exist at the time when the DEXT is complete.]()

[constr_1803] Existence of *DiagnosticEnvDataCondition.dataElement* [For each *DiagnosticEnvDataCondition*, that attribute *dataElement* shall exist at the time when the DEXT is complete.]()

5.4.2.2 Mode Condition

[TPS_DEXT_01119] Semantics of *DiagnosticEnvModeCondition* [The meta-class *DiagnosticEnvModeCondition* represents an atomic condition that compares the current value of the referenced *ModeDeclarationGroupPrototype* with the value of a *ModeDeclaration* taken as the reference value.] (*RS_DEXT_00079*)

The concrete modeling of this aspect is sketched in Figure D.4.

Please note that the *ModeDeclarationGroupPrototype* as well as the applicable *ModeDeclaration* are both referenced in the concrete modeling of the attribute *DiagnosticEnvSwcModeElement.mode*.

The idea behind this modeling approach (for more information, please refer to Figure D.4) is that the *ModeDeclaration* can only be a member of the specific *ModeDeclarationGroup* taken to type the respective *ModeDeclarationGroupPrototype* anyway.

Admittedly, this relation could be expressed by means of two references and a formal constraint or it could be expressed by way of a single reference that's implying an interpreting of the model in a specific way. AUTOSAR opts for the latter alternative, which is detailed by [TPS_DEXT_01120].

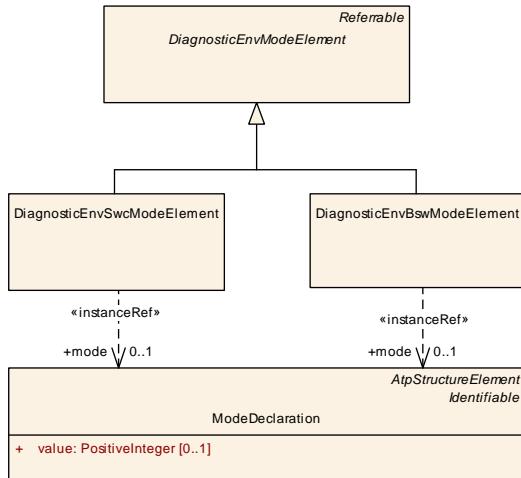


Figure 5.5: Specializations of `DiagnosticEnvModeElement`

[TPS_DEXT_01120] Comparison of the value of a `ModeDeclarationGroupPrototype` with a `ModeDeclaration` [For the comparison of the value of a `ModeDeclarationGroupPrototype` with a `ModeDeclaration`, two alternatives apply, depending on whether mode condition is executed in application software (swc) or basic software (bsw):]

- The `ModeDeclarationGroupPrototype` referenced in the role `DiagnosticEnvSwcModeElement.mode.contextModeDeclarationGroup` shall be compared to the `ModeDeclaration` referenced in the role `DiagnosticEnvSwcModeElement.mode.targetMode`.
- The `ModeDeclarationGroupPrototype` referenced in the role `DiagnosticEnvBswModeElement.mode.contextModeDeclarationGroup` shall be compared to the `ModeDeclaration` referenced in the role `DiagnosticEnvBswModeElement.mode.targetMode`.

] (RS_DEXT_00079)

Please note that the two alternatives mentioned in [TPS_DEXT_01120] are described in Figure 5.5.

[constr_1466] Allowed values of `compareType` in the context of a `DiagnosticEnvModeCondition` [Within the context of a `DiagnosticEnvDataCondition` only a subset of the values of `DiagnosticCompareTypeEnum` is supported for the inherited attribute `compareType`, namely:

- `DiagnosticCompareTypeEnum isEqual`
- `DiagnosticCompareTypeEnum isNotEqual`

] ()

[constr_1467] References in `DiagnosticEnvModeCondition` [In a `DiagnosticEnvModeCondition` the reference `modeElement` shall only point to a `DiagnosticEnvModeElement` that is aggregated inside the same `DiagnosticEnvironmentalCondition` as the `DiagnosticEnvModeCondition` itself.]()

Please note that the main benefit of the existence of the dedicated meta-class `DiagnosticEnvModeElement` is to keep the (serialized) model clean. Given the fulfillment of [constr_1467], the potentially lengthy `InstanceRef` for identifying the operands of a mode comparison does not (if applicable) have to be repeated but can be reused multiple times in the context of the enclosing `DiagnosticEnvironmentalCondition`.

Class	<code>DiagnosticEnvModeCondition</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	<p>DiagnosticEnvModeCondition are atomic condition based on the comparison of the active Mode Declaration in a ModeDeclarationGroupPrototype with the constant value of a ModeDeclaration.</p> <p>The formulation of this condition uses only one DiagnosticEnvElement, which contains enough information to deduce the variable part (i.e. the part that changes at runtime) as well as the constant part of the comparison.</p> <p>Only DiagnosticCompareTypeEnum isEqual or DiagnosticCompareTypeEnum isNotEqual are eligible values for DiagnosticAtomicCondition.compareType.</p>			
Base	<code>ARObject</code> , <code>DiagnosticEnvCompareCondition</code> , <code>DiagnosticEnvConditionFormulaPart</code>			
Attribute	Type	Mult.	Kind	Note
modeElement	<code>DiagnosticEnvModeElement</code>	0..1	ref	This reference represents both the ModeDeclaration GroupPrototype and the ModeDeclaration relevant for the mode comparison.

Table 5.16: `DiagnosticEnvModeCondition`

[constr_1804] Existence of `DiagnosticEnvModeCondition.modeElement` [For each `DiagnosticEnvModeCondition`, that attribute `modeElement` shall exist **at the time when the DEXT is complete**.]()

Class	<code>DiagnosticEnvModeElement</code> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	<p>All ModeDeclarations that are referenced in a <code>DiagnosticEnvModeCondition</code> shall be defined as a <code>DiagnosticEnvModeElement</code> of this <code>DiagnosticEnvironmentalCondition</code>.</p> <p>This concept keeps the ARXML clean: It avoids that the <code>DiagnosticEnvConditionFormula</code> is cluttered by lengthy <code>InstanceRef</code> definitions.</p> <p>Furthermore, it allows that an <code>InstanceRef</code> only needs to be defined once and can be used multiple times in the different <code>DiagnosticEnvModeConditions</code>.</p>			
Base	<code>ARObject</code> , <code>Referrable</code>			
Subclasses	<code>DiagnosticEnvBswModeElement</code> , <code>DiagnosticEnvSwcModeElement</code>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.17: `DiagnosticEnvModeElement`

Class	DiagnosticEnvSwcModeElement			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	This meta-class represents the ability to refer to a ModeDeclaration in a concrete System context.			
Base	ARObject, DiagnosticEnvModeElement , Referrable			
Attribute	Type	Mult.	Kind	Note
mode	ModeDeclaration	0..1	iref	<p>This reference identifies both the ModeDeclarationGroup Prototype and the ModeDeclaration for the specific mode comparison.</p> <p>InstanceRef implemented by: PModelInSystemInstanceRef</p>

Table 5.18: DiagnosticEnvSwcModeElement

[constr_1805] Existence of [DiagnosticEnvSwcModeElement.mode](#) [For each [DiagnosticEnvSwcModeElement](#), that attribute `mode` shall exist **at the time when the DEXT is complete.**.]()

Class	DiagnosticEnvBswModeElement			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition			
Note	This meta-class represents the ability to refer to a specific ModeDeclaration in the scope of a BswModule Description.			
Base	ARObject, DiagnosticEnvModeElement , Referrable			
Attribute	Type	Mult.	Kind	Note
mode	ModeDeclaration	1	iref	<p>This reference identifies both the ModeDeclarationGroup Prototype and the ModeDeclaration for the specific mode comparison.</p> <p>InstanceRef implemented by: ModelInBswModuleDescriptionInstanceRef</p>

Table 5.19: DiagnosticEnvBswModeElement

[constr_1806] Existence of [DiagnosticEnvBswModeElement.mode](#) [For each [DiagnosticEnvBswModeElement](#), that attribute `mode` shall exist **at the time when the DEXT is complete.**.]()

5.5 Diagnostic Services supported by AUTOSAR

The following sub-chapters describe the modeling of the collection of relevant diagnostic services as defined in the ISO 14229-1 [16]. This means that the definition of the AUTOSAR [DiagnosticExtract](#) does not explicitly support the total collection of diagnostic services as defined by [16].

Some diagnostic services compiled in this document define so-called sub-functions that need to be identified to fully specify the nature of the respective diagnostic service.

[TPS_DEXT_01045] Supported diagnostic services [The table 5.20 shows the UDS services supported by the [DiagnosticExtract](#).] ([RS_DEXT_00003](#), [RS_DEXT_00004](#), [RS_DEXT_00005](#), [RS_DEXT_00006](#), [RS_DEXT_00007](#), [RS_DEXT_00008](#),

(RS_DEXT_00009, RS_DEXT_00010, RS_DEXT_00011, RS_DEXT_00012, RS_DEXT_00013, RS_DEXT_00014, RS_DEXT_00015, RS_DEXT_00016, RS_DEXT_00017, RS_DEXT_00018, RS_DEXT_00019, RS_DEXT_00020, RS_DEXT_00021, RS_DEXT_00022)

ID	Service
0x10	SessionControl
0x11	EcuReset
0x14	ClearDiagnosticInformation
0x19	ClearDTCInformation
0x22	ReadDataByIdentifier
0x23	ReadMemoryByAddress
0x27	SecurityAccess
0x28	CommunicationControl
0x2A	ReadDataByPeriodicIdentifier
0x2C	DynamicallyDefineDataIdentifier
0x2E	WriteDataByIdentifier
0x2F	IOControl
0x31	RoutineControl
0x34	RequestDownload
0x35	RequestUpload
0x36	TransferData
0x37	RequestTransferExit
0x3D	WriteMemoryByAddress
0x85	ControlDTCSetting
0x86	ResponseOnEvent

Table 5.20: Supported diagnostic services

[TPS_DEXT_01013] Specification of sub-functions by means of attribute `DiagnosticServiceInstance.category` [

In all cases where a diagnostic service defines a sub-function according to ISO 14229-1 [16], the value of the attribute `category` of the applicable sub-class of `DiagnosticServiceInstance` can be used to specify the applicable sub-function as a textual token.

Constraints are defined to clarify the existence of standardized values of the attribute `category` for the given sub-function. This implies that an instance of the given sub-class of `DiagnosticServiceInstance` only has a single sub-function at a time.] (*RS_DEXT_00049, RS_DEXT_00051*)

[TPS_DEXT_01014] Possible values of the `category` attribute for diagnostic services [AUTOSAR claims the right to standardize the possible values of the attribute `category` for given diagnostic services.] (*RS_DEXT_00001, RS_DEXT_00051*)

If applicable, AUTOSAR allows for the usage of values of the attribute `category` other than the standardized values.

In this case, however, proprietary values of the attribute `category` shall be prefixed with a company-specific name fragment in order to avoid collisions that could occur if or when the list of possible values claimed by the AUTOSAR standard itself is extended. Example:

Listing 5.2: Example for the definition of a custom `category`

```
<AR-PACKAGE>
  <SHORT-NAME>DiagnosticExtractExample</SHORT-NAME>
  <ELEMENTS>
    <DIAGNOSTIC-ECU-RESET>
      <SHORT-NAME>ResetTheHardWay</SHORT-NAME>
      <CATEGORY>ACME_REALLY_HARD_RESET</CATEGORY>
    </DIAGNOSTIC-ECU-RESET>
  </ELEMENTS>
</AR-PACKAGE>
```

5.5.1 DataByIdentifier

This chapter describes the modeling of diagnostic services `ReadDataByIdentifier` (0x22) and `WriteDataByIdentifier` (0x2E).

The purpose of this diagnostic service is to enable a tester to request the values of data records from the AUTOSAR diagnostics stack. The data records are identified by a formally modeled `DiagnosticDataIdentifier`.

The modeling of this diagnostic service comprises the two meta-classes `DiagnosticReadDataByIdentifier` and `DiagnosticWriteDataByIdentifier`. These meta-classes both need to specify the set of `DiagnosticDataIdentifier`s and the set of applicable `DiagnosticAccessPermissions`.

As these properties are shared between instances of `DiagnosticReadDataByIdentifier` and `DiagnosticWriteDataByIdentifier`, an abstract base class named `DiagnosticDataByIdentifier` has been created that provides the actual references to `DiagnosticDataIdentifier` and `DiagnosticAccessPermission`.

[TPS_DEXT_01054] Existence of `DiagnosticDataByIdentifier.dataIdentifier` [The configuration of a given `DiagnosticDataByIdentifier` is considered incomplete until the reference in the role `DiagnosticDataByIdentifier.dataIdentifier` exists.] ([RS_DEXT_00007](#), [RS_DEXT_00013](#), [RS_DEXT_00034](#))

The meaning of **[TPS_DEXT_01054]** is that the reference may be missing in intermediate steps of the configuration work flow. But at the point in time when ECU configuration is generated from the `DiagnosticExtract` the reference is needed to make sense of the model for the given `DiagnosticDataByIdentifier`.

The ability to read multiple DIDs at run-time is controlled via attribute `DiagnosticReadDataByIdentifierClass.maxDidToDelete` and therefore it is sufficient to (at configuration-time) limit the multiplicity of attribute `dataIdentifier` to 1.

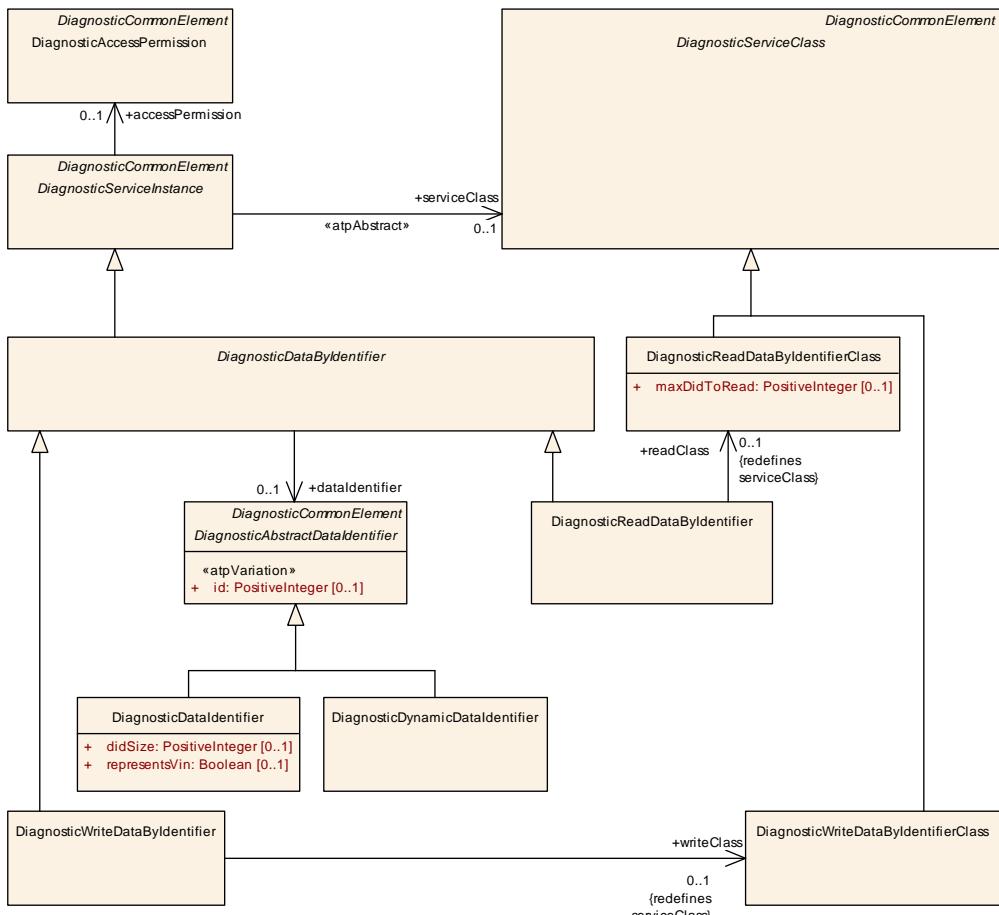


Figure 5.6: Modeling of diagnostic services ReadDataByIdentifier (0x22) and WriteDataByIdentifier (0x2E)

Please note that the reference `DiagnosticDataByIdentifier.dataIdentifier` goes to `DiagnosticAbstractDataIdentifier`. This modeling approach allows to actually reference any of the meta-classes that inherit from `DiagnosticAbstractDataIdentifier`.

Class	DiagnosticReadDataByIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This represents an instance of the "Read Data by Identifier" diagnostic service. Tags:atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticDataByIdentifier, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
readClass	<code>DiagnosticReadDataByIdentifierClass</code>	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadDataByIdentifier in the given context.</p>

Table 5.21: DiagnosticReadDataByIdentifier

**[constr_1807] Existence of reference [DiagnosticDataByIdentifier](#).
dataIdentifier [For each [DiagnosticDataByIdentifier](#), the reference
dataIdentifier shall exist at the time when the DEXT is complete.]()**

Class	DiagnosticWriteDataByIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This represents an instance of the "Write Data by Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticDataByIdentifier , DiagnosticServiceInstance , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
writeClass	DiagnosticWriteDataByIdentifierClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticWriteDataByIdentifier in the given context.

Table 5.22: [DiagnosticWriteDataByIdentifier](#)

Class	DiagnosticWriteDataByIdentifierClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This meta-class contains attributes shared by all instances of the "Write Data by Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceClass , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.23: [DiagnosticWriteDataByIdentifierClass](#)

Class	DiagnosticDataByIdentifier (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This represents an abstract base class for all diagnostic services that access data by identifier.			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceInstance , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Subclasses	DiagnosticReadDataByIdentifier , DiagnosticReadScalingDataByIdentifier , DiagnosticWriteDataByIdentifier			
Attribute	Type	Mult.	Kind	Note
dataIdentifier	DiagnosticAbstractDataIdentifier	0..1	ref	This represents the linked DiagnosticDataIdentifier .

Table 5.24: [DiagnosticDataByIdentifier](#)

The modeling of [DiagnosticDataByIdentifier](#) represents concrete instances of diagnostic services within a [DiagnosticExtract](#). However, there are attributes that are shared among all instances of [DiagnosticReadDataByIdentifier](#).

For this purpose the dedicated service class [DiagnosticReadDataByIdentifierClass](#) has been introduced.

Class	DiagnosticReadDataByIdentifierClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This meta-class contains attributes shared by all instances of the "Read Data by Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
maxDidToRead	PositiveInteger	0..1	attr	This attribute represents the maximum number of allowed DIDs in a single instance of DiagnosticReadDataByIdentifier.

Table 5.25: DiagnosticReadDataByIdentifierClass

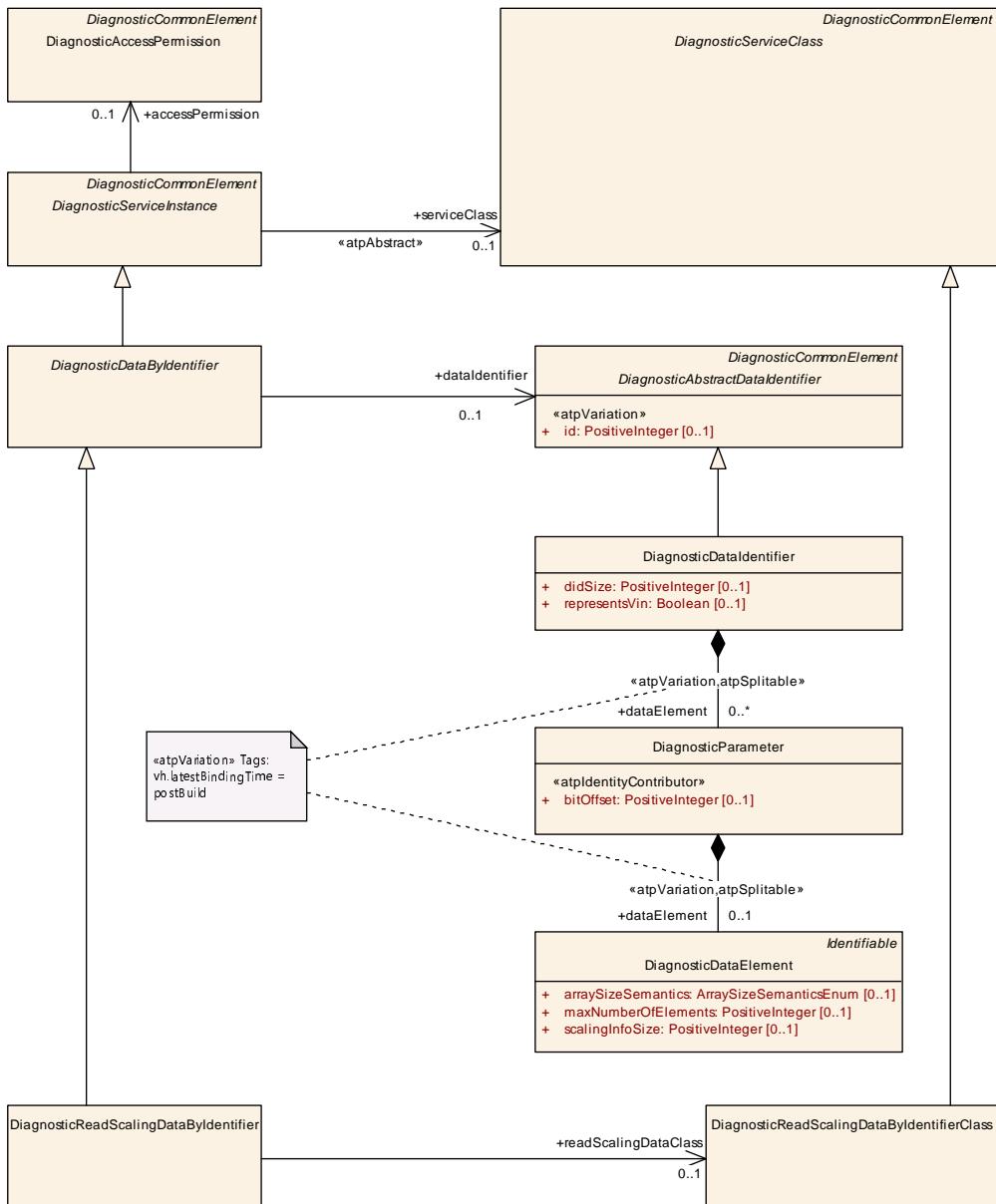
Please note that it is possible to create a reference to a concrete [DiagnosticDataIdentifier](#) from different [DiagnosticServiceInstances](#).

[TPS_DEXT_01050] Consistency of DiagnosticServiceSwMapping with respect to data IDs [For each [DiagnosticServiceSwMapping](#) that references a [DiagnosticValueNeeds](#) and a [DiagnosticDataByIdentifier](#), the value of [DiagnosticValueNeeds.didNumber](#) shall be ignored and the value of [DiagnosticDataByIdentifier.dataIdentifier.id](#) shall be taken instead.] ([RS_DEXT_00007](#), [RS_DEXT_00013](#), [RS_DEXT_00034](#), [RS_DEXT_00052](#))

Class	DiagnosticValueNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the general needs on the configuration of the Diagnostic Communication Manager (DCM) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the DCM which are not related to a particular item. In the case of using a sender receiver communicated value, the related value shall be taken via assigned Data in the role "signalBasedDiagnostics". In case of using a client/server communicated value, the related value shall be communicated via the port referenced by asssignedPort. The details of this communication (e.g. appropriate naming conventions) are specified in the related software specifications (SWS).			
Base	<i>ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, Service Needs</i>			
Attribute	Type	Mult.	Kind	Note
dataLength	PositiveInteger	0..1	attr	This attribute is applicable only if the ServiceNeed is aggregated within BswModuleDependency. This attribute represents the length of data (in bytes) provided for this particular PID signal.
diagnosticValueAccess	DiagnosticValueAccess Enum	0..1	attr	This attribute controls whether the data can be read and written or whether it is to be handled read-only.
didNumber	PositiveInteger	0..1	attr	This represents a Data identifier for the diagnostic value. This allows to predefined the DID number if the responsible function developer has received a particular requirement from the OEM or from a standardization body.
fixedLength	Boolean	0..1	attr	This attribute controls whether the data length of the data is fixed.



Class	DiagnosticValueNeeds			
processingStyle	DiagnosticProcessingStyleEnum	0..1	attr	This attribute controls whether interaction requires the software-component to react synchronously on a request or whether it processes the request in background but still the DCM has to issue the call again to eventually obtain the result of the request.

Table 5.26: DiagnosticValueNeeds

Figure 5.7: Modeling of diagnostic services ReadScalingDataByIdentifier (0x24)

[TPS_DEXT_01146] Support for service ReadScalingDataByIdentifier (0x24) [The AUTOSAR Diagnostic Extract supports the configuration of UDS service ReadScalingDataByIdentifier (0x24). For this purpose meta-classes

`DiagnosticReadScalingDataByIdentifier` and `DiagnosticReadScalingDataByIdentifierClass` shall be used.] (*RS_DEXT_00007, RS_DEXT_00034*)

[constr_1623] Restriction on `DiagnosticReadScalingDataByIdentifier.dataIdentifier` [The reference `DiagnosticReadScalingDataByIdentifier.dataIdentifier` shall only refer to a `DiagnosticDataIdentifier`.] ()

[constr_1624] Existence of `DiagnosticDataElement.scalingInfoSize` [The attribute `DiagnosticDataElement.scalingInfoSize` shall only exist if the enclosing `DiagnosticParameter` is aggregated by a `DiagnosticDataIdentifier` that is referenced by a `DiagnosticReadScalingDataByIdentifier` in the role `DiagnosticReadScalingDataByIdentifier.dataIdentifier`.] ()

Class	<code>DiagnosticReadScalingDataByIdentifier</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This represents an instance of the "Read Scaling Data by Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticDataByIdentifier, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
readScalingDataClass	<code>DiagnosticReadScalingDataByIdentifierClass</code>	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticReadScalingDataByIdentifier</code> in the given context.</p>

Table 5.27: `DiagnosticReadScalingDataByIdentifier`

Class	<code>DiagnosticReadScalingDataByIdentifierClass</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier			
Note	This meta-class contains attributes shared by all instances of the "Read Scaling Data by Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDataByIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.28: `DiagnosticReadScalingDataByIdentifierClass`

5.5.2 IOControl

This chapter describes the modeling of diagnostic services InputOutput Control (0x2F). The purpose of this service is to provide the tester with the ability to override values exchanged with the AUTOSAR hardware abstraction.

[TPS_DEXT_01015] Meaning of attributes of `DiagnosticIOControl` [The attributes `freezeCurrentState`, `resetToDefault`, and `shortTermAdjustment`

represent the capabilities of the server rather than a concrete request message.] ([RS_DEXT_00014](#))

[TPS_DEXT_01016] The capability returnControlToEcu [According to the statement made by [\[TPS_DEXT_01015\]](#), there is no formal means provided to configure the capability to execute *returnControlToEcu*. This lack of configuration is intentional because the capability is always available and cannot be revoked anyway.] ([RS_DEXT_00014](#))

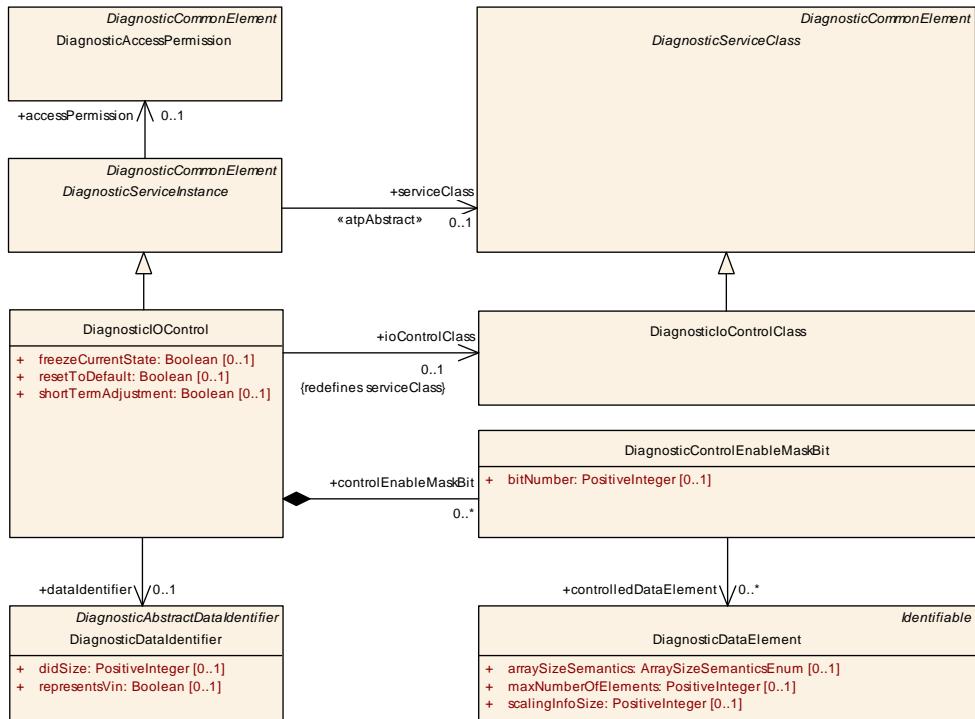


Figure 5.8: Modeling of diagnostic service **IOControl (0x2F)**

[TPS_DEXT_01017] Meaning of `DiagnosticIOControl.dataIdentifier` [The `DiagnosticIOControl.dataIdentifier` is taken for specifying the payload for the service.

However, in some cases `dataIdentifier` models the payload of the request message (`DiagnosticIOControl.shortTermAdjustment` is set to true) and in some cases it represents the payload of the response message.] ([\(RS_DEXT_00014, RS_DEXT_00034\)](#))

Please note that the referenced `dataIdentifier` itself may aggregate several `DiagnosticDataElement`s.

At run-time, only some `DiagnosticDataElement`s may be relevant for a specific execution of the service InputOutput Control. For this purpose, the diagnostic message contains the so-called `ControlEnableMaskRecord` (for more information, please refer to [\[SWS_DCM_00581\]](#)).

[TPS_DEXT_01089] Definition of an *identifier* of a `DiagnosticIOControl` [The *identifier* of a `DiagnosticIOControl` is defined by the attribute `DiagnosticIOControl.dataIdentifier.id`.] (*RS_DEXT_00037*)

Class	<code>DiagnosticIOControl</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::IOControl			
Note	This represents an instance of the "I/O Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticIoControls			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceInstance</i> , <i>Identifiable</i> , <i>MultilanguageReferable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
controlEnableMaskBit	<code>DiagnosticControl</code> <code>EnableMaskBit</code>	*	aggr	This aggregation represents the control mask record consisting of single bits.
dataIdentifier	<code>DiagnosticDataIdentifier</code>	0..1	ref	This represents the corresponding <code>DiagnosticDataIdentifier</code>
freezeCurrentState	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a <code>freezeCurrentState</code> .
ioControlClass	<code>DiagnosticIoControl</code> <code>Class</code>	0..1	ref	This reference substantiates that abstract reference in the role <code>serviceClass</code> for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticIOControl</code> in the given context.
resetToDefault	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a <code>resetToDefault</code> .
shortTermAdjustment	Boolean	0..1	attr	Setting this attribute to true represents the ability of the Dcm to execute a <code>shortTermAdjustment</code> .

Table 5.29: `DiagnosticIOControl`

Class	<code>DiagnosticIoControlClass</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::IOControl			
Note	This meta-class contains attributes shared by all instances of the "I/O Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticIoControls			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceClass</i> , <i>Identifiable</i> , <i>MultilanguageReferable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.30: `DiagnosticIoControlClass`

[TPS_DEXT_01018] InputOutput Control does not define any sub-functions

[The diagnostic service `InputOutput Control` does not define any sub-functions, therefore the value of `DiagnosticIOControl.category` does not need to be constrained.] (*RS_DEXT_00014*, *RS_DEXT_00051*)

[TPS_DEXT_01051] Consistency of `DiagnosticServiceSwMapping` with respect to data IDs [For each `DiagnosticServiceSwMapping` that references a `DiagnosticIoControlNeeds` and a `DiagnosticIOControl`, the value of `DiagnosticIoControlNeeds.didNumber` shall be ignored and the value of `DiagnosticIOControl.dataIdentifier.id` shall be taken instead.] (*RS_DEXT_00014*, *RS_DEXT_00052*)

Class	DiagnosticI/oControlNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the general needs on the configuration of the Diagnostic Communication Manager (DCM) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the Dcm which are not related to a particular item.			
Base	<i>ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, Service Needs</i>			
Attribute	Type	Mult.	Kind	Note
currentValue	DiagnosticValueNeeds	0..1	ref	Reference to the DiagnosticValueNeeds indicating the access to the current value via signalBasedDiagnostics.
didNumber	PositiveInteger	0..1	attr	This represents a Data identifier for the diagnostic value. This allows to predefine the DID number if the a function developer has received a particular requirement from the OEM or from a standardization body.
freezeCurrent StateSupported	Boolean	0..1	attr	This attribute determines, if the referenced port supports temporary freezing of I/O value.
resetToDefault Supported	Boolean	0..1	attr	This represents a flag for the existence of the ResetTo Default operation in the service interface.
shortTerm Adjustment Supported	Boolean	0..1	attr	This attribute determines, if the referenced port supports temporarily setting of I/O value to a specific value provided by the diagnostic tester.

Table 5.31: DiagnosticI/oControlNeeds

[TPS_DEXT_01150] Semantics of meta-class [DiagnosticControlEnableMaskBit](#) [By aggregating [DiagnosticControlEnableMaskBit](#) at [DiagnosticI/oControl](#) it is possible to specify **I/O control channels** in the diagnostic extract.

The reference [DiagnosticControlEnableMaskBit.controlledDataElement](#) identifies all [DiagnosticDataElements](#) that belong to the I/O control channel represented by the bit in the control mask record.] ([RS_DEXT_00014](#), [RS_DEXT_00034](#))

Class	DiagnosticControlEnableMaskBit			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::IOControl			
Note	This meta-class has the ability to represent one bit in the control enable mask record.			
Base	<i>ARObject</i>			
Attribute	Type	Mult.	Kind	Note
bitNumber	PositiveInteger	0..1	attr	This attribute represents the bit number of the bit in the control mask record. Bit number 0 is the most significant bit (MSB) in the first byte of the CEMR in the network presentation.
controlledData Element	DiagnosticDataElement	*	ref	This reference represents the collection of Diagnostic DataElements that are controlled by this bit of the control mask record.

Table 5.32: DiagnosticControlEnableMaskBit

Please note that the modeling of the [controlEnableMaskBit](#) intentionally does not use the `ordered` annotation to assign bit numbers to the aggregated [DiagnosticControlEnableMaskBits](#).

The control mask record does not necessarily have to be used from top to bottom without gaps. Example: bit 3 could be unused, but 0,1, and 4 could be used.

[constr_1721] `DiagnosticControlEnableMaskBit.bitNumber` shall be unique
 [Within the context of the enclosing `DiagnosticIOControl` the value of attribute `DiagnosticIOControl.controlEnableMaskBit.bitNumber` shall be unique.]()

Please note that within the context of a `DiagnosticIOControl`, it is **not** required to have 0 as the lowest value of aggregated `DiagnosticIOControl.controlEnableMaskBit.bitNumber`.

[constr_1722] Relation between reference `DiagnosticIOControl.dataIdentifier` and attribute `DiagnosticIOControl.controlEnableMaskBit` [Any `DiagnosticDataElement` referenced in the role `DiagnosticIOControl.controlEnableMaskBit.controlledDataElement` shall be defined in the scope of the `DiagnosticDataIdentifier` that is referenced in the role `DiagnosticIOControl.dataIdentifier`.]()

5.5.3 EcuReset

This chapter describes the modeling of diagnostic services `EcuReset` (0x11).

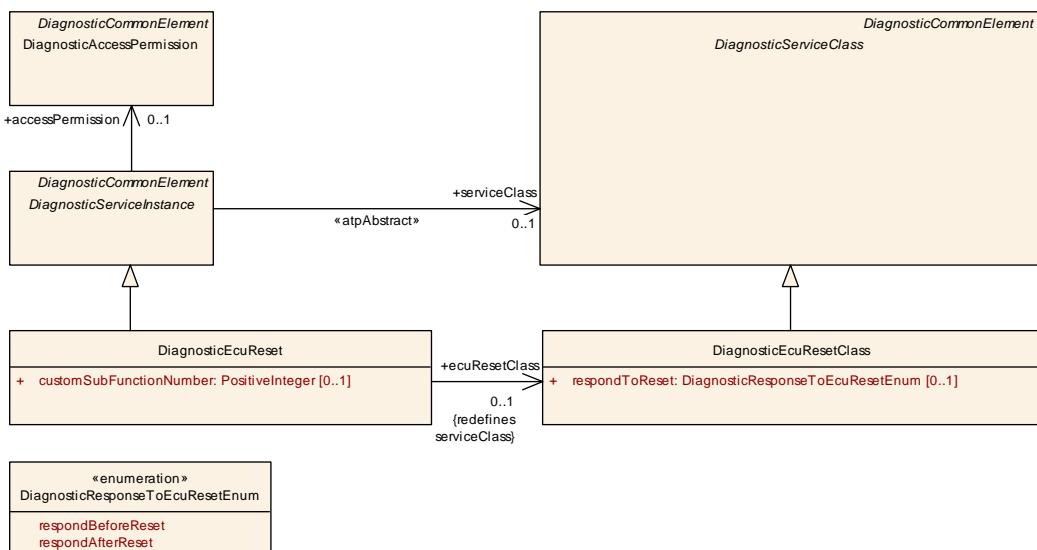


Figure 5.9: Modeling of diagnostic service `EcuReset` (0x11)

Class	DiagnosticEcuReset			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EcuReset			
Note	This represents an instance of the "ECU Reset" diagnostic service. Tags:atp.recommendedPackage=DiagnosticEcuResets			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticServiceInstance</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticEcuReset			
customSubFunctionNumber	PositiveInteger	0..1	attr	This attribute shall be used to define a custom sub-function number if none of the standardized values of category shall be used.
ecuResetClass	DiagnosticEcuReset Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticEcuReset in the given context.</p>

Table 5.33: DiagnosticEcuReset

Class	DiagnosticEcuResetClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EcuReset			
Note	This meta-class contains attributes shared by all instances of the "Ecu Reset" diagnostic service. Tags: atp.recommendedPackage=DiagnosticEcuResets			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
respondToReset	DiagnosticResponseToEcuResetEnum	0..1	attr	This attribute defines whether the response to the Ecu Reset service shall be transmitted before or after the actual reset.

Table 5.34: DiagnosticEcuResetClass

Enumeration	DiagnosticResponseToEcuResetEnum			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::EcuReset			
Note				
Literal	<i>Description</i>			
respondAfterReset	Answer to EcuReset service should come after the reset. Tags: atp.EnumerationLiteralIndex=0			
respondBeforeReset	Answer to EcuReset service should come before the reset. Tags: atp.EnumerationLiteralIndex=1			

Table 5.35: DiagnosticResponseToEcuResetEnum

Please note that (as already explained in section 5.5) the SubFunctions of this service are modeled by means of the **category** attribute.

[TPS_DEXT_01056] Applicable values for `DiagnosticEcuReset.category` [The following values of the attribute `DiagnosticEcuReset.category` are standardized by AUTOSAR:

- HARD_RESET
- KEY_OFF_ON_RESET
- SOFT_RESET
- ENABLE_RAPID_POWER_SHUT_DOWN
- DISABLE_RAPID_POWER_SHUT_DOWN

The meaning of these values is described in the applicable ISO document [16].] ([RS_DEXT_00001](#), [RS_DEXT_00004](#), [RS_DEXT_00051](#))

[TPS_DEXT_01019] Correspondence of `category` values to numerical values mentioned in the ISO 14229-1 [The ISO 14229-1 [16] standard document defines specific numerical values for the sub-functions of the diagnostic service `EcuReset`.]

The correspondence of the numerical values to the pre-defined values of `category` according to [TPS_DEXT_01056] is pretty obvious because the definition of values defined in [TPS_DEXT_01056] has been directly inspired by the ISO 14229-1 [16] standard document.] ([RS_DEXT_00001](#), [RS_DEXT_00004](#), [RS_DEXT_00051](#))

[TPS_DEXT_01020] Manufacturer-specific values for sub-functions of service `EcuReset` [The ISO 14229-1 [16] standard document, beyond the standardized numerical values for sub-functions, reserves a numerical range of subFunction identifiers for manufacturer- or supplier-specific use.]

In this case it is possible to define further values for `category`, provided that a custom prefix is used to avoid potential name clashes with further extensions of the AUTOSAR standard, namely [TPS_DEXT_01056].] ([RS_DEXT_00001](#), [RS_DEXT_00004](#), [RS_DEXT_00051](#))

[TPS_DEXT_01021] Semantics of `DiagnosticEcuReset.customSubFunctionNumber` [The attribute `DiagnosticEcuReset.customSubFunctionNumber` has been introduced to allow for the specification of a manufacturer- or supplier-specific value to represent the custom sub-function in the diagnostic communication.]

The tuple created by the values of attributes `DiagnosticEcuReset.category` and `DiagnosticEcuReset.customSubFunctionNumber` fully specifies identification of the manufacturer- or supplier-specific sub-function.] ([RS_DEXT_00004](#), [RS_DEXT_00047](#), [RS_DEXT_00051](#))

[constr_1331] Existence of `DiagnosticEcuReset.customSubFunctionNumber` [The attribute `DiagnosticEcuReset.customSubFunctionNumber` shall only exist if the value of `DiagnosticEcuReset.category` is outside the standardized set of values as defined by [TPS_DEXT_01056].] ()

[constr_1332] Value range for `DiagnosticEcuReset.customSubFunctionNumber` [The allowed value for `DiagnosticEcuReset.customSubFunctionNumber` shall always be within the closed interval `0x40 .. 0x7E`.] ()

5.5.4 ClearDiagnosticInformation

This chapter describes the modeling of diagnostic services `ClearDiagnosticInformation` (0x14). As the name suggests, the purpose of the service is to clear diagnostic information in the AUTOSAR diagnostics stack.

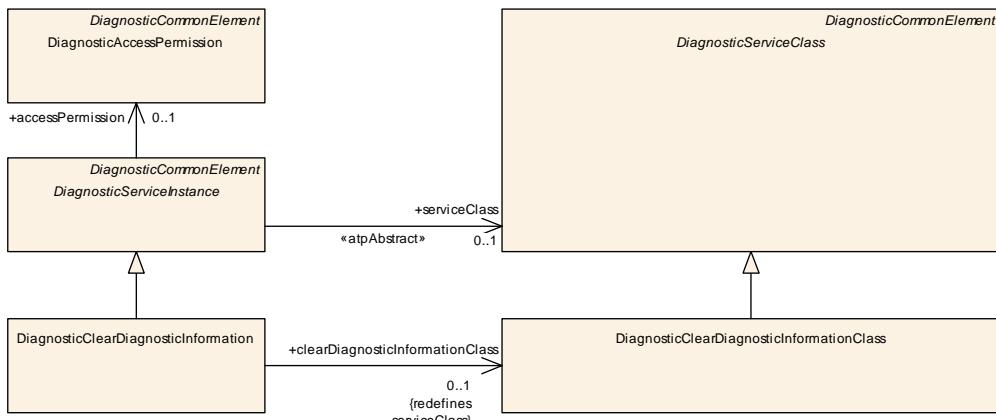


Figure 5.10: Modeling of diagnostic service `ClearDiagnosticInformation` (0x14)

Please note that there is nothing to configure for `DiagnosticClearDiagnosticInformation` beyond its mere existence.

Class	DiagnosticClearDiagnosticInformation			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ClearDiagnosticInfo			
Note	This represents an instance of the "Clear Diagnostic Information" diagnostic service. Tags: atp.recommendedPackage=DiagnosticClearDiagnosticInformations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
clearDiagnosticInformation Class	<code>DiagnosticClearDiagnosticInformation</code>	0..1	ref	<p>This reference substantiates that abstract reference in the role <code>serviceClass</code> for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticClearDiagnosticInformation</code> in the given context.</p>

Table 5.36: DiagnosticClearDiagnosticInformation

Class	DiagnosticClearDiagnosticInformationClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ClearDiagnosticInfo			
Note	This meta-class contains attributes shared by all instances of the "Clear Diagnostic Information" diagnostic service. Tags: atp.recommendedPackage=DiagnosticClearDiagnosticInformations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.37: DiagnosticClearDiagnosticInformationClass

[TPS_DEXT_01022] `ClearDiagnosticInformation` does not define any sub-functions [The diagnostic service `ClearDiagnosticInformation` does not define any sub-functions, therefore the value of `DiagnosticClearDiagnosticInformation.category` does not need to be constrained.] ([RS_DEXT_00001](#), [RS_DEXT_00005](#), [RS_DEXT_00051](#))

5.5.5 Memory Services

This chapter describes the modeling of diagnostic services for memory access (0x23, 0x3D, 0x34-0x37). The purpose of these services is to access memory on the diagnostic stack on request of the tester.

The service description for accessing memory for diagnostic purposes is modeled by the abstract meta-class [DiagnosticMemoryByAddress](#). It is supposed to provide all model properties relevant for the memory access.

The description of memory access, to some extent, requires a formal description of the memory segments to take into account. For this purpose the meta-class [DiagnosticMemoryIdentifier](#) has been introduced and referenced by [DiagnosticMemoryAddressableRangeAccess](#) in the role [memoryRange](#).

The intent of this modeling was not to provide a generic memory model but to allow for the specification of memory properties just as far as diagnostics is concerned.

The aggregation of [DiagnosticMemoryIdentifier](#) at [DiagnosticMemoryByAddress](#) may or may not be relevant for an OEM. However, there is certainly a use case for adding this information to a [DiagnosticExtract](#) that goes back from a tier-1 supplier to an OEM as sort of documentation of the diagnostic configuration.

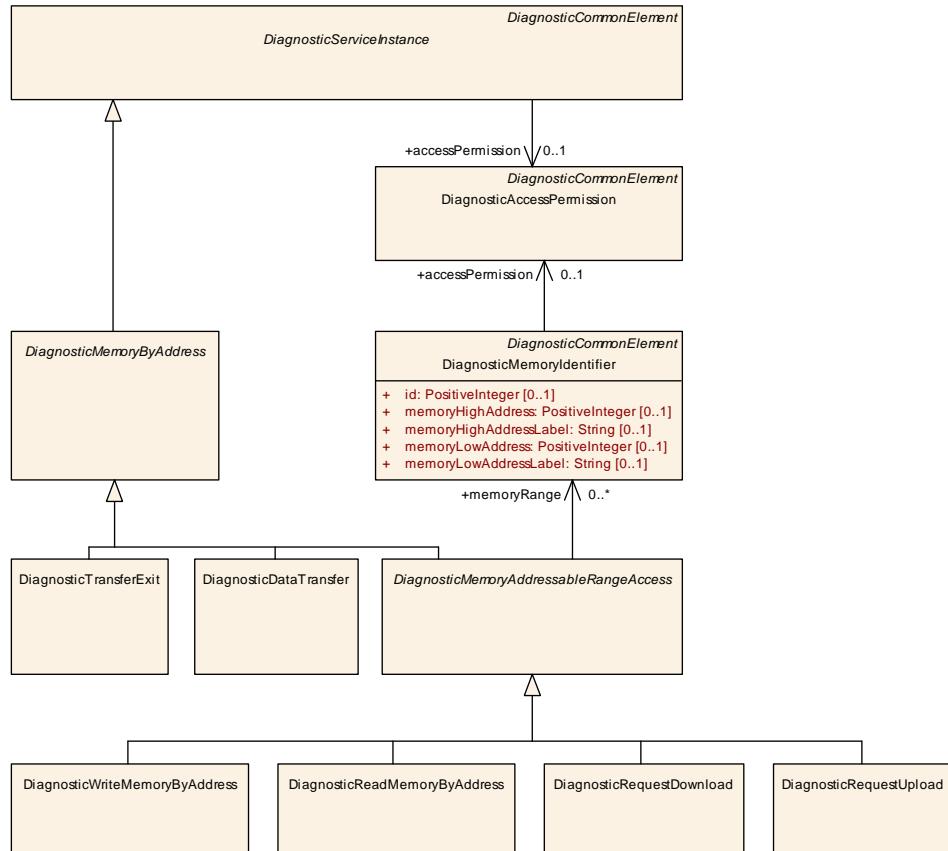


Figure 5.11: Modeling of diagnostic services Memory (0x23, 0x3D, 0x34-0x37)

As [DiagnosticMemoryByAddress](#) represents a generic base class for all kinds of diagnostic memory access, it is also necessary to model the particular sub-classes that address specific use cases for diagnostic memory access.

These sub-classes are conceptually on the same level as other sub-classes of [DiagnosticServiceInstance](#).

In other words, the case of memory access deviates from the modeling of other diagnostic services such that there is one further abstract base class involved.

[constr_1333] Existence of [DiagnosticMemoryIdentifier.memoryLowAddress](#) and [DiagnosticMemoryIdentifier.memoryHighAddress](#) [The attributes [DiagnosticMemoryIdentifier.memoryLowAddress](#) as well as [DiagnosticMemoryIdentifier.memoryHighAddress](#) shall not exist if the [DiagnosticMemoryIdentifier](#) referenced in the role [memoryRange](#) is referenced by a [DiagnosticRequestDownload](#) or a [DiagnosticRequestUpload](#).]()

[constr_1411] Existence of [DiagnosticMemoryIdentifier.memoryHighAddressLabel](#) vs. [DiagnosticMemoryIdentifier.memoryHighAddress](#) [At most **one** of the attributes in the following list shall exist:

- [DiagnosticMemoryIdentifier.memoryHighAddressLabel](#)
- [DiagnosticMemoryIdentifier.memoryHighAddress](#)

]()

[constr_1412] Existence of [DiagnosticMemoryIdentifier.memoryLowAddressLabel](#) vs. [DiagnosticMemoryIdentifier.memoryLowAddress](#) [At most **one** of the attributes in the following list shall exist:

- [DiagnosticMemoryIdentifier.memoryLowAddressLabel](#)
- [DiagnosticMemoryIdentifier.memoryLowAddress](#)

]()

Please note that it does not make sense to describe a memory address in this context **both** numerically **and** symbolically. If the address is described at all (see [constr_1333]) then it shall be done **either** symbolically or numerically. This is the motivation of the existence of [constr_1411] and [constr_1412].

Class	DiagnosticMemoryByAddress (abstract)
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress
Note	This represents an abstract base class for diagnostic services that deal with accessing memory by address.
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceInstance , Identifiable , MultilanguageReferrable , PackageableElement , Referrable
Subclasses	DiagnosticDataTransfer , DiagnosticMemoryAddressableRangeAccess , DiagnosticTransferExit





Class	DiagnosticMemoryByAddress (abstract)			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.38: DiagnosticMemoryByAddress

Class	DiagnosticMemoryAddressableRangeAccess (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This abstract base class			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	DiagnosticReadMemoryByAddress, DiagnosticRequestDownload, DiagnosticRequestUpload, DiagnosticWriteMemoryByAddress			
Attribute	Type	Mult.	Kind	Note
memoryRange	DiagnosticMemoryIdentifier	*	ref	This represents the formal description of the memory segment to which the DiagnosticMemoryByAddress applies.

Table 5.39: DiagnosticMemoryAddressableRangeAccess

Class	DiagnosticMemoryIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class represents the ability to define memory properties from the diagnostics point of view. Tags: atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
accessPermission	DiagnosticAccessPermission	0..1	ref	This represents that access permission defined for the specific DiagnosticMemoryIdentifier.
id	PositiveInteger	0..1	attr	This represents the identification of the memory segment.
memoryHighAddress	PositiveInteger	0..1	attr	This represents the upper bound for addresses of the memory segment.
memoryHighAddressLabel	String	0..1	attr	This represents a symbolic label for the upper bound for addresses of the memory segment.
memoryLowAddress	PositiveInteger	0..1	attr	This represents the lower bound for addresses of the memory segment.
memoryLowAddressLabel	String	0..1	attr	This represents a symbolic label for the lower bound for addresses of the memory segment.

Table 5.40: DiagnosticMemoryIdentifier

Class	DiagnosticWriteMemoryByAddress			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Write Memory by Address" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryAddressableRangeAccess, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			

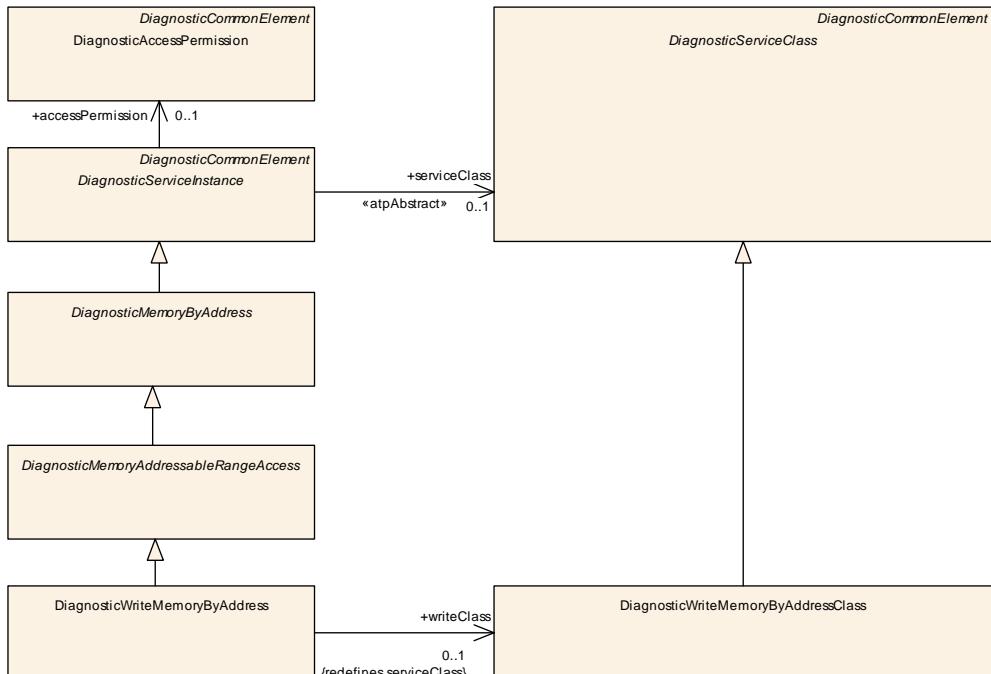




Class	DiagnosticWriteMemoryByAddress			
Attribute	Type	Mult.	Kind	Note
writeClass	DiagnosticWriteMemoryByAddressClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticWritememoryByAddress in the given context.</p>

Table 5.41: DiagnosticWriteMemoryByAddress

Class	DiagnosticWriteMemoryByAddressClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Write Memory by Address" diagnostic service. Tags:atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

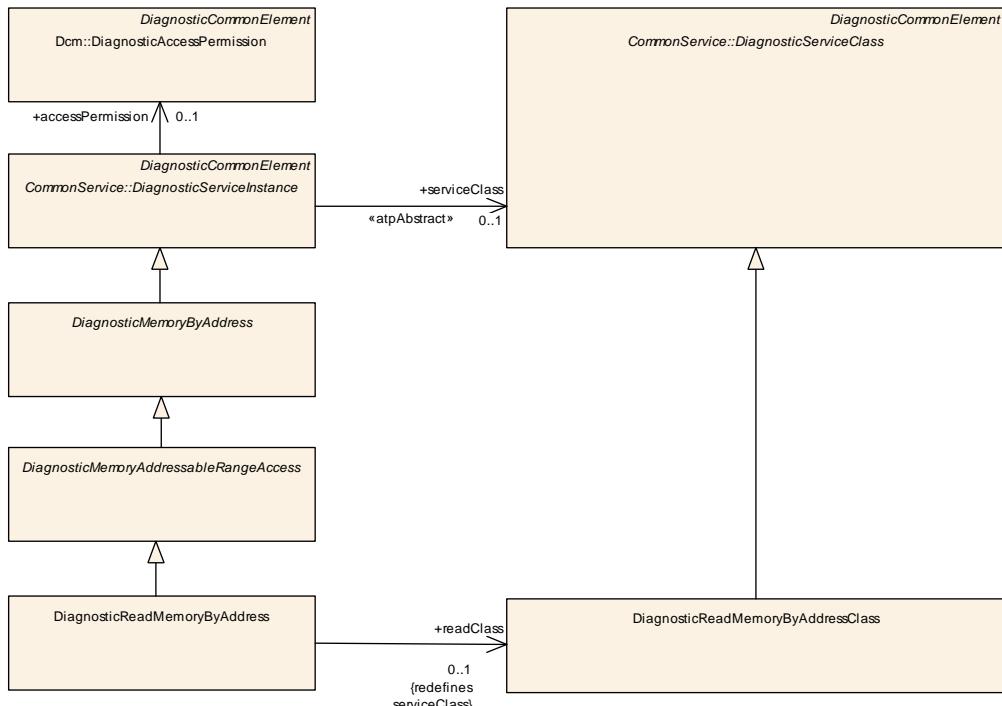
Table 5.42: DiagnosticWriteMemoryByAddressClass

Figure 5.12: Modeling of diagnostic service WriteMemoryByAddress (0x3D)

[TPS_DEXT_01023] WriteMemoryByAddress does not define any sub-functions
 [The diagnostic service WriteMemoryByAddress does not define any sub-functions, therefore the value of `DiagnosticWriteMemoryByAddress.category` does not need to be constrained.] ([RS_DEXT_00001](#), [RS_DEXT_00020](#), [RS_DEXT_00051](#))

Class	DiagnosticReadMemoryByAddress			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Read Memory by Address" diagnostic service.			
Tags:	atp.recommendedPackage=DiagnosticMemoryByAddress			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryAddressableRangeAccess, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
readClass	DiagnosticReadMemoryByAddressClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadMemoryByAddress in the given context.</p>

Table 5.43: DiagnosticReadMemoryByAddress

Class	DiagnosticReadMemoryByAddressClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Read Memory by Address" diagnostic service.			
Tags:	atp.recommendedPackage=DiagnosticMemoryByAddress			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.44: DiagnosticReadMemoryByAddressClass

Figure 5.13: Modeling of diagnostic service ReadMemoryByAddress (0x23)

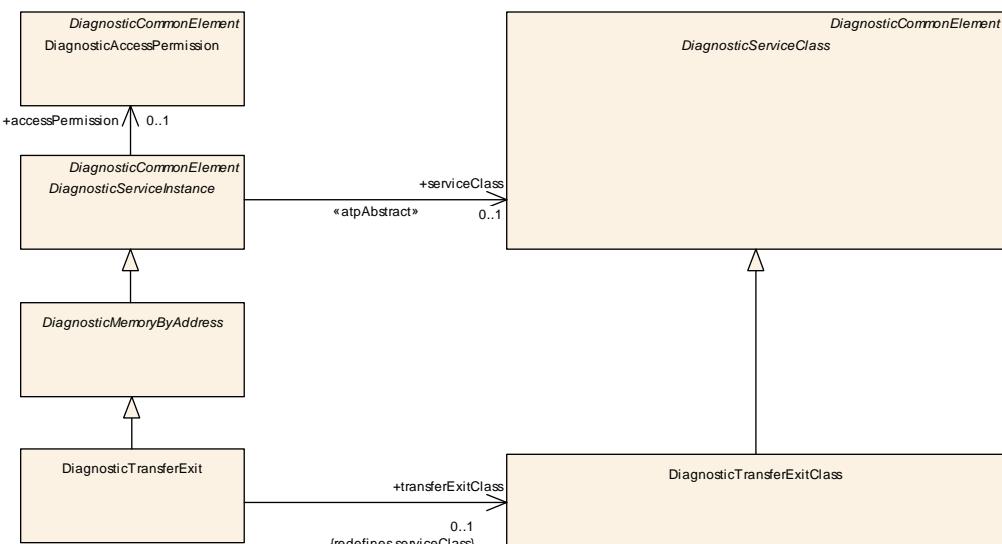
[TPS_DEXT_01024] ReadMemoryByAddress does not define any sub-functions

The diagnostic service `ReadMemoryByAddress` does not define any sub-functions, therefore the value of `DiagnosticReadMemoryByAddress.category` does not need to be constrained.] ([\(RS_DEXT_00001, RS_DEXT_00008, RS_DEXT_00051\)](#))

Class	DiagnosticTransferExit			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Transfer Exit" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAdressss			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticMemoryByAddress , DiagnosticServiceInstance , Identifiable , MultilanguageReferable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
transferExit Class	DiagnosticTransferExit Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticTransferExit in the given context.</p>

Table 5.45: DiagnosticTransferExit

Class	DiagnosticTransferExitClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Transfer Exit" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAdressss			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceClass , Identifiable , MultilanguageReferable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.46: DiagnosticTransferExitClass

Figure 5.14: Modeling of diagnostic service TransferExit (0x37)
[TPS_DEXT_01025] TransferExit does not define any sub-functions [The diagnostic service `TransferExit` does not define any sub-functions, therefore the value

of `DiagnosticTransferExit.category` does not need to be constrained.] ([RS_DEXT_00001](#), [RS_DEXT_00019](#), [RS_DEXT_00051](#))

Class	DiagnosticDataTransfer			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Data Transfer" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAddress			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataTransfer Class	DiagnosticDataTransfer Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticDataTransfer in the given context.</p>

Table 5.47: DiagnosticDataTransfer

Class	DiagnosticDataTransferClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Data Transfer" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAddress			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.48: DiagnosticDataTransferClass

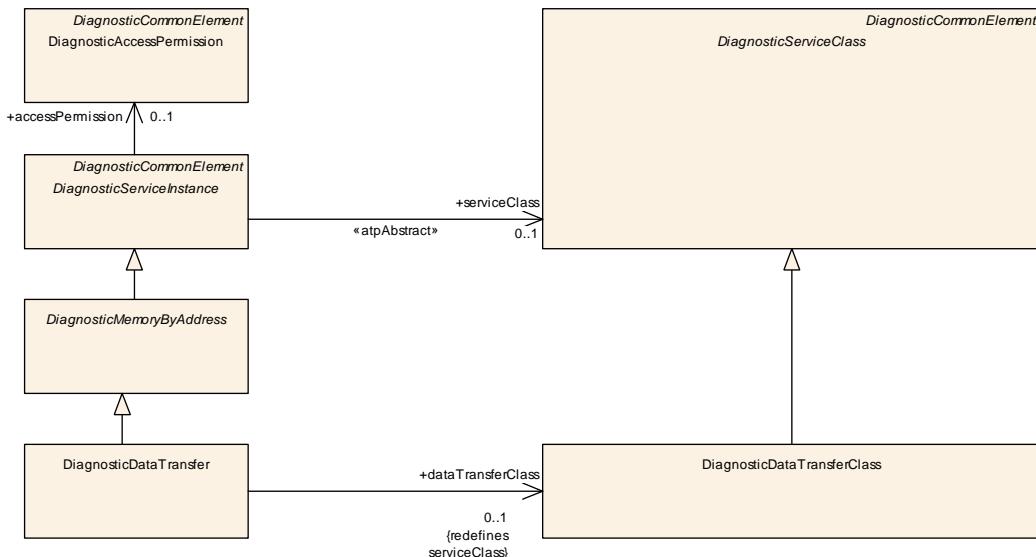


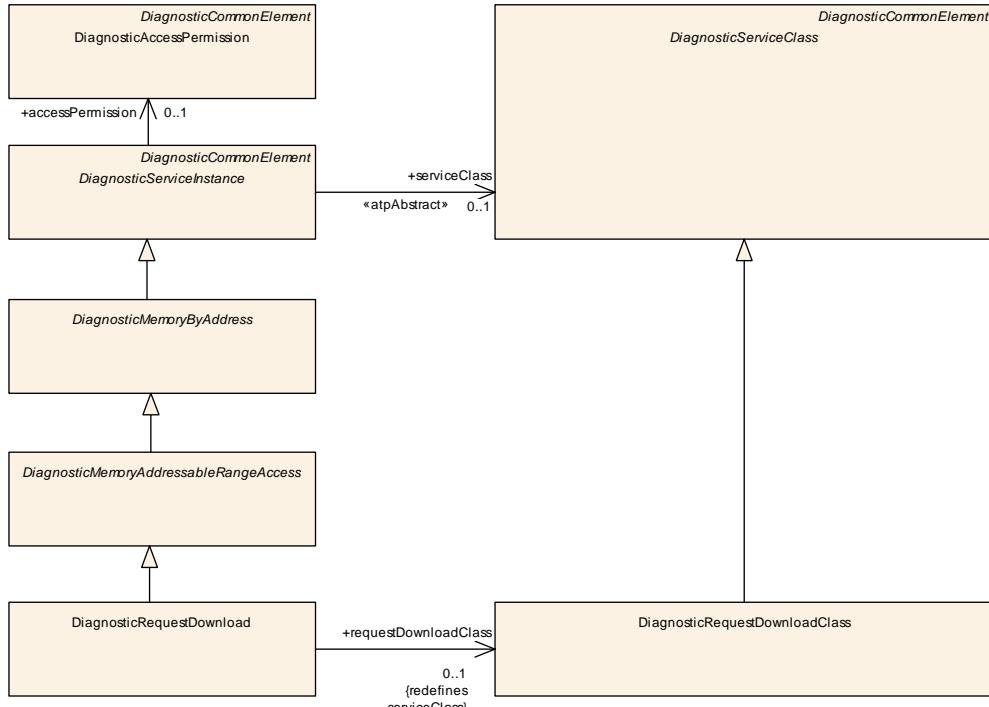
Figure 5.15: Modeling of diagnostic service DataTransfer (0x36)

[[TPS_DEXT_01026](#)] **DataTransfer does not define any sub-functions** [The diagnostic service `DataTransfer` does not define any sub-functions, therefore the value of `DiagnosticDataTransfer.category` does not need to be constrained.] ([RS_DEXT_00001](#), [RS_DEXT_00018](#), [RS_DEXT_00051](#))

Class	DiagnosticRequestDownload			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Request Download" diagnostic service.			
Tags:	atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryAddressableRangeAccess, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
requestDownloadClass	DiagnosticRequestDownloadClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestDownload in the given context.</p>

Table 5.49: DiagnosticRequestDownload

Class	DiagnosticRequestDownloadClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Request Download" diagnostic service.			
Tags:	atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
–	–	–	–	–

Table 5.50: DiagnosticRequestDownloadClass

Figure 5.16: Modeling of diagnostic service RequestDownload (0x34)

[TPS_DEXT_01027] RequestDownload does not define any sub-functions [The diagnostic service RequestDownload does not define any sub-functions, therefore the value of `DiagnosticRequestDownload.category` does not need to be constrained.] (`RS_DEXT_00001`, `RS_DEXT_00016`, `RS_DEXT_00051`)

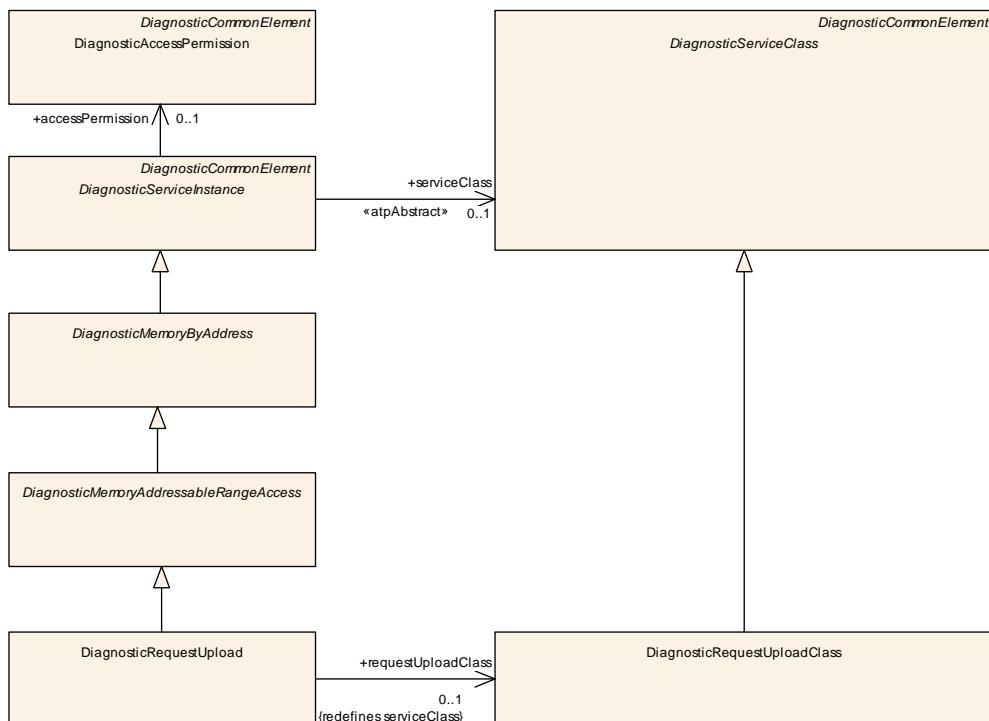


Figure 5.17: Modeling of diagnostic service RequestDownload (0x35)

Class	DiagnosticRequestUpload			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This represents an instance of the "Request Upload" diagnostic service. Tags: atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemory, AddressableRangeAccess, DiagnosticMemoryByAddress, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
requestUpload Class	DiagnosticRequestUploadClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestUpload in the given context.</p>

Table 5.51: DiagnosticRequestUpload

Class	DiagnosticRequestUploadClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress			
Note	This meta-class contains attributes shared by all instances of the "Request Upload" diagnostic service.			
Tags	atp.recommendedPackage=DiagnosticMemoryByAdresss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.52: DiagnosticRequestUploadClass

[TPS_DEXT_01028] RequestUpload does not define any sub-functions [The diagnostic service RequestUpload does not define any sub-functions, therefore the value of `DiagnosticRequestUpload.category` does not need to be constrained.] ([RS_DEXT_00001](#), [RS_DEXT_00017](#), [RS_DEXT_00051](#))

5.5.6 CommunicationControl

This chapter describes the modeling of diagnostic services CommunicationControl (0x28). The purpose of this diagnostic service is to enable or disable [ISignalIPduGroupS](#).

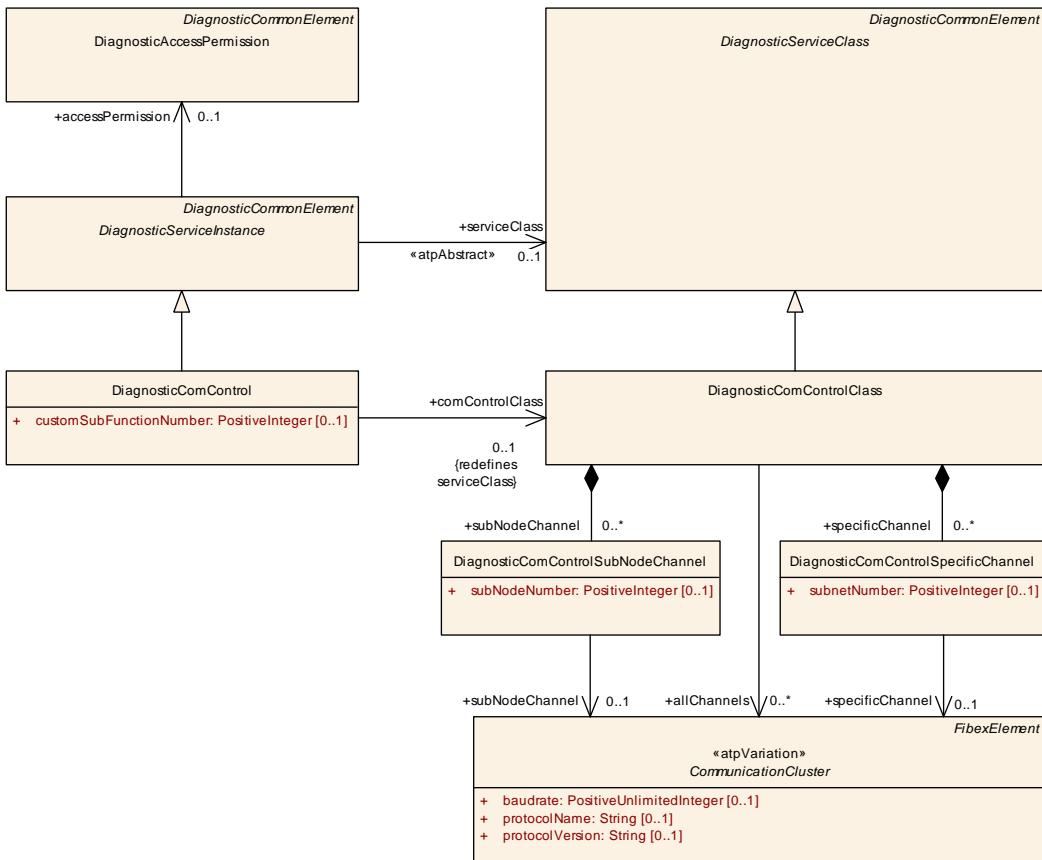


Figure 5.18: Modeling of diagnostic service CommunicationControl (0x28)

However, the actual implementation of the enabling or disabling is obviously not executed directly within the diagnostic stack. It requires some interaction with the BswM that in turn implements the enabling algorithm.

Therefore, the meta-class modeled for this purpose does not need to refer to [ISignalIPduGroups](#) but implements a mode request to the BswM.

[TPS_DEXT_01057] Allowed values of `DiagnosticComControl.category` [The sub-functions of the diagnostic services `CommunicationControl` are identified by means of the attribute `DiagnosticComControl.category`. Standardized values of `DiagnosticComControl.category` are:

- `ENABLE_RX_AND_TX`
- `DISABLE_RX_AND_TX`
- `ENABLE_RX_AND_DISABLE_TX`
- `DISABLE_RX_AND_ENABLE_TX`
- `ENABLE_RX_AND_DISABLE_TX_WITH_ENHANCED_ADDRESS_INFORMATION`
- `ENABLE_RX_AND_TX_WITH_ENHANCED_ADDRESS_INFORMATION`

The meaning of these values is described in the applicable ISO document [16].] ([RS_DEXT_00001](#), [RS_DEXT_00010](#), [RS_DEXT_00051](#))

[TPS_DEXT_01029] Correspondence of `category` values to numerical values mentioned in the ISO 14229-1 [The ISO 14229-1 [16] standard document defines specific numerical values for the sub-functions of the diagnostic service `CommunicationControl`.

The correspondence of the numerical values to the pre-defined values of `category` according to [TPS_DEXT_01057] is pretty obvious because the definition of values defined in [TPS_DEXT_01057] has been directly inspired by the ISO 14229-1 [16] standard document.] ([RS_DEXT_00001](#), [RS_DEXT_00010](#), [RS_DEXT_00051](#))

[TPS_DEXT_01030] Manufacturer-specific values for sub-functions of service `CommunicationControl` [The ISO 14229-1 [16] standard document, beyond the standardized numerical values for sub-functions, reserves a numerical range of sub-Function identifiers for manufacturer-specific use.

In this case it is possible to define further values for `category`, provided that a custom prefix is used to avoid potential name clashes with further extensions of the AUTOSAR standard, namely [TPS_DEXT_01057].] ([RS_DEXT_00010](#), [RS_DEXT_00047](#), [RS_DEXT_00051](#))

[TPS_DEXT_01031] Semantics of `DiagnosticComControl.customSubFunctionNumber` [The attribute `DiagnosticComControl.customSubFunctionNumber` has been introduced to allow for the specification of a manufacturer-or supplier-specific value to represent the custom sub-function in the diagnostic communication.

The tuple created by the values of attributes `DiagnosticComControl.category` and `DiagnosticComControl.customSubFunctionNumber` fully specifies identification of the manufacturer- or supplier-specific sub-function.]()*(RS_DEXT_00010, RS_DEXT_00047, RS_DEXT_00051)*

[constr_1334] Existence of `DiagnosticComControl.customSubFunctionNumber` [The attribute `DiagnosticComControl.customSubFunctionNumber` shall only exist if the value of `DiagnosticComControl.category` is outside the standardized set of values as defined by `[TPS_DEXT_01057]`.]()

[constr_1335] Possible values for `DiagnosticComControl.customSubFunctionNumber` [Given the fulfillment of **[constr_1334]**, the value of a given `DiagnosticComControl.customSubFunctionNumber` shall always be within the closed interval `0x40 .. 0x5F` (for manufacturer-specific sub-functions) or the closed interval `0x60 .. 0x7E` (for supplier-specific sub-functions).]()

[TPS_DEXT_01032] Impact of the `DiagnosticComControlClass` on the state management for `CommunicationClusters` [The impact of the `DiagnosticComControlClass` on the state management for `CommunicationClusters`s can have two alternative consequences:

- All `CommunicationClusters`s are affected. For this purpose the attribute `allChannels` has the ability to identify the applicable `CommunicationClusters`.

It may seem counterintuitive to require a reference to all applicable `CommunicationClusters` when the expected semantics is actually to define an impact on **all** of them.

However, there could be private `CommunicationClusters`s that are not participating in the diagnostics work-flow: These need to be kept out of scope and therefore the explicit identification of applicable `CommunicationClusters`s makes sense.

- A selected number of `CommunicationClusters`s is affected. This is conceptually different from the other use case in that it requires an additional attribute that keeps a `subnetNumber` that is typically assigned by the OEM role.

]()*(RS_DEXT_00010)*

Class	<>atpVariation>> <code>CommunicationCluster</code> (abstract)
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreTopology





Class	<>atpVariation>> CommunicationCluster (abstract)			
Note	<p>The CommunicationCluster is the main element to describe the topological connection of communicating ECUs.</p> <p>A cluster describes the ensemble of ECUs, which are linked by a communication medium of arbitrary topology (bus, star, ring, ...). The nodes within the cluster share the same communication protocol, which may be event-triggered, time-triggered or a combination of both.</p> <p>A CommunicationCluster aggregates one or more physical channels.</p> <p>Tags:vh.latestBindingTime=postBuild</p>			
Base	<i>ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferrable, Packageable Element, Referrable</i>			
Subclasses	<i>AbstractCanCluster, EthernetCluster, FlexrayCluster, LinCluster, UserDefinedCluster</i>			
Attribute	Type	Mult.	Kind	Note
baudrate	PositiveUnlimitedInteger	0..1	attr	Channels speed in bits/s.
physical Channel	PhysicalChannel	1..*	aggr	<p>This relationship defines which channel element belongs to which cluster. A channel shall be assigned to exactly one cluster, whereas a cluster may have one or more channels.</p> <p>Note: This atpSplittable property has no atp.Splitkey due to atpVariation (PropertySetPattern).</p> <p>Stereotypes: atpSplittable; atpVariation Tags:vh.latestBindingTime=systemDesignTime</p>
protocolName	String	0..1	attr	The name of the protocol used.
protocolVersion	String	0..1	attr	The version of the protocol used.

Table 5.53: CommunicationCluster

[constr_1336] Applicable value range for *DiagnosticComControlSpecific-Channel.subnetNumber* [The value of attribute *DiagnosticComControlSpecificChannel.subnetNumber* shall be within the closed interval **1 .. 14.**]()

Please note that the regulation implied by [constr_1336] has not been introduced on an arbitrary basis but gets its conceptual background from the ISO 14229-1 [16] standard document.

Obviously, a diagnostic service with the name *CommunicationControl* will have an impact on the enclosing ECU's mode management. This impact, however, is not defined by any further attributes or references, the *DiagnosticComControl* is the impact.

By defining a *DiagnosticComControl* and setting the category to one of the applicable values (e.g. *ENABLE_RX_AND_TX*), it is possible to express the intended semantics to the full extent.

[constr_1337] Allowed value range for attribute *DiagnosticComControlSubN-odeChannel.subNodeNumber* [The value of attribute *DiagnosticComControl-SubNodeChannel.subNodeNumber* shall not exceed the closed interval **0 .. 65535.**]()

[TPS_DEXT_01074] Difference between the attributes `DiagnosticComControl-Class.specificChannel` and `DiagnosticComControlClass.subNodeChannel` [The semantical difference between the attributes `DiagnosticComControl-Class.specificChannel` and `DiagnosticComControlClass.subNodeChannel` is that `DiagnosticComControlClass.specificChannel` actually refers to a `CommunicationCluster` whereas `DiagnosticComControlClass.subNodeChannel` basically refers to a `CommunicationCluster` to which the nodes with the given identification numbers are connected.] ([RS_DEXT_00010](#))

Class	DiagnosticComControl			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl			
Note	This represents an instance of the "Communication Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticCommunicationControls			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
comControl Class	DiagnosticComControl Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticComControl in the given context.</p>
customSub Function Number	PositiveInteger	0..1	attr	This attribute shall be used to define a custom sub-function number if none of the standardized values of category shall be used.

Table 5.54: DiagnosticComControl

Class	DiagnosticComControlSpecificChannel			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl			
Note	This represents the ability to add further attributes to the definition of a specific channel that is subject to the diagnostic service "communication control".			
Base	<i>ARObject</i>			
Attribute	Type	Mult.	Kind	Note
specificChannel	CommunicationCluster	0..1	ref	This represents the affected CommunicationClusters in the role specificChannel
subnetNumber	PositiveInteger	0..1	attr	This represents the applicable subnet number (which is an arbitrary number ranging from 1..14)

Table 5.55: DiagnosticComControlSpecificChannel

Class	DiagnosticComControlClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl			
Note	This meta-class contains attributes shared by all instances of the "Communication Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticCommunicationControls			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticComControlClass			
allChannels	CommunicationCluster	*	ref	<p>This reference represents the semantics that all available channels shall be affected. It is still necessary to refer to individual CommunicationClusters because there could be private CommunicationClusters in the System Extract that are not subject to the service "communication control".</p> <p>By referring to the applicable CommunicationClusters it can be made sure that only the affected CommunicationClusters are accessed.</p>
specificChannel	DiagnosticComControl SpecificChannel	*	aggr	This represents the ability to add additional attributes to the case that only specific channels are supposed to be considered,
subNode Channel	DiagnosticComControl SubNodeChannel	*	aggr	This attribute represents the ability to add further attributes to the definition of a specific sub-node channel that is subject to the diagnostic service "communication control".

Table 5.56: DiagnosticComControlClass

Class	DiagnosticComControlSubNodeChannel			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl			
Note	This represents the ability to add further attributes to the definition of a specific sub-node channel that is subject to the diagnostic service "communication control".			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
subNode Channel	CommunicationCluster	0..1	ref	This represents the affected CommunicationClusters in the role subNodeChannel
subNode Number	PositiveInteger	0..1	attr	This represents the applicable subNode number. The value corresponds to the request message parameter nodIdentificationNumber of diagnostic service CommunicationControl (0x28).

Table 5.57: DiagnosticComControlSubNodeChannel

5.5.7 DynamicallyDefineDataIdentifier

This chapter describes the modeling of diagnostic services `DynamicallyDefineDataIdentifier` (0x2C). The purpose of the service is to allow for defining data identifiers (DID) at run-time.

By this means it is possible to combine existing diagnostic data into a single DID.

This semantics is reflected by the modeling of the meta-class `DiagnosticDynamicallyDefineDataIdentifier` that refers to a `DiagnosticDynamicDataIdentifier` in the role `dataIdentifier`.

Also, the `DiagnosticDynamicallyDefineDataIdentifier` inherits a reference to `accessPermission` from `DiagnosticServiceInstance`.

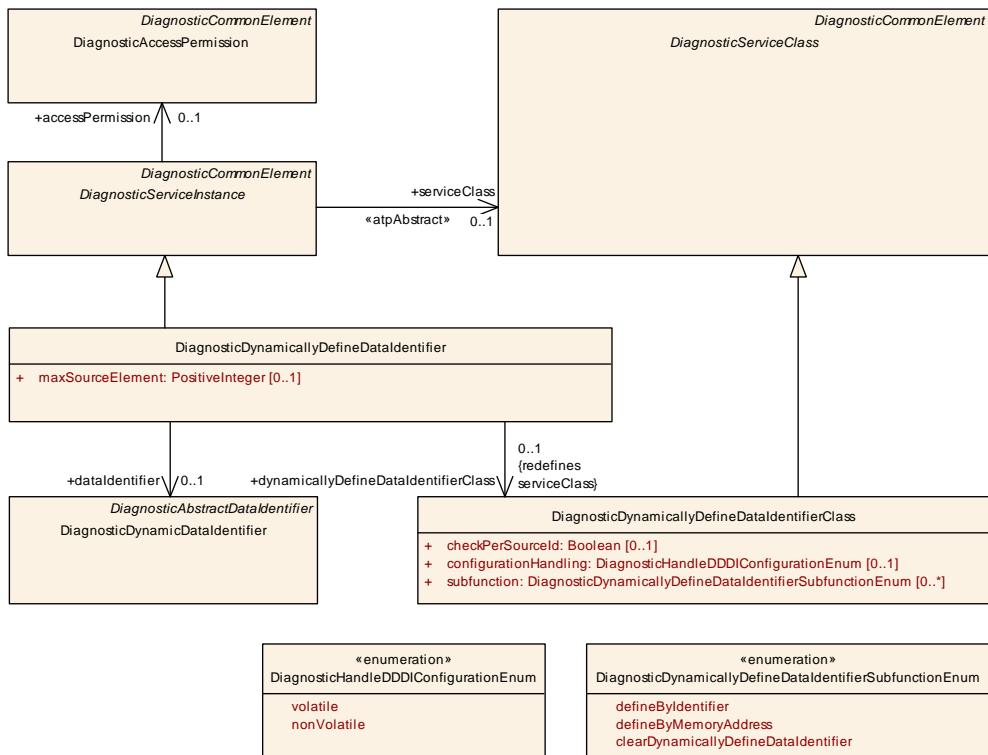


Figure 5.19: Modeling of diagnostic service `DynamicallyDefineDataIdentifier` (0x2C)

[constr_1421] Consistency of `DiagnosticDynamicallyDefineDataIdentifierClass.subfunction` [The values of `DiagnosticDynamicallyDefineDataIdentifierClass.subfunction` shall not repeat, i.e. every value of `DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum` shall at most appear once in the `subfunction` attribute.] ()

Class	DiagnosticDynamicallyDefineDataIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier			
Note	This represents an instance of the "Dynamically Define Data Identifier" diagnostic service. Tags:atp.recommendedPackage=DiagnosticDynamicallyDefineDataIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataIdentifier	DiagnosticDynamicDataIdentifier	0..1	ref	This represents the applicable DiagnosticDynamicDataIdentifier.
dynamically DefineData IdentifierClass	DiagnosticDynamicallyDefineDataIdentifierClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticDynamicallyDefineDataIdentifier in the given context.
maxSource Element	PositiveInteger	0..1	attr	This represents the maximum number of source elements of the dynamically created DID.

Table 5.58: DiagnosticDynamicallyDefineDataIdentifier

[constr_1808] Existence of reference `DiagnosticDynamicallyDefineDataIdentifier.dataIdentifier` [For each `DiagnosticDynamicallyDefineDataIdentifier`, the reference to `DiagnosticDynamicDataIdentifier` in the role `dataIdentifier` shall exist at the time when the DEXT is complete.]()

Class	<code>DiagnosticDynamicallyDefineDataIdentifierClass</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier			
Note	This meta-class contains attributes shared by all instances of the "Dynamically Define Data Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticDynamicallyDefineDataIdentifiers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
checkPerSourceId	Boolean	0..1	attr	If set to TRUE, the Dcm module shall check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF. If set to FALSE, the Dcm module shall not check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF.
configurationHandling	<code>DiagnosticHandleDDDIConfigurationEnum</code>	0..1	attr	This configuration switch defines whether DDDID definition is handled as non-volatile information or not.
subfunction	<code>DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum</code>	*	attr	This attribute contains a list of applicable subfunctions for all <code>DiagnosticDynamicallyDefineDataIdentifier</code> that reference the <code>DiagnosticDynamicallyDefineDataIdentifier</code> Class.

Table 5.59: `DiagnosticDynamicallyDefineDataIdentifierClass`

Enumeration	<code>DiagnosticHandleDDDIConfigurationEnum</code>
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier
Note	This meta-class represents the options for controlling how the configuration of the DynamicallyDefineDataIdentifiers is done in the given context.
Literal	Description
nonVolatile	This indicates that the configuration of DynamicallyDefineDataIdentifier shall be stored as non-volatile data. Tags: atp.EnumerationLiteralIndex=0
volatile	This indicates that the configuration of DynamicallyDefineDataIdentifier shall be handled as volatile data. Tags: atp.EnumerationLiteralIndex=1

Table 5.60: `DiagnosticHandleDDDIConfigurationEnum`

Enumeration	<code>DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum</code>
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier
Note	This meta-class contains a list of possible subfunctions for the UDS service 0x2C.
Literal	Description



<i>Enumeration</i>	DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum
clearDynamicallyDefineDataIdentifier	Clear the specified dynamic data identifier. Tags: atp.EnumerationLiteralIndex=0
defineByIdentifier	The definition of dynamic data identifier shall be done via a reference to a diagnostic data identifier. Tags: atp.EnumerationLiteralIndex=1
defineByMemoryAddress	The definition of dynamic data identifier shall be done via a reference to a memory address. Tags: atp.EnumerationLiteralIndex=2

Table 5.61: DiagnosticDynamicallyDefineDataIdentifierSubfunctionEnum

5.5.8 ReadDataByPeriodicIdentifier

This chapter describes the modeling of diagnostic services `ReadDataByPeriodicIdentifier` (0x2A).

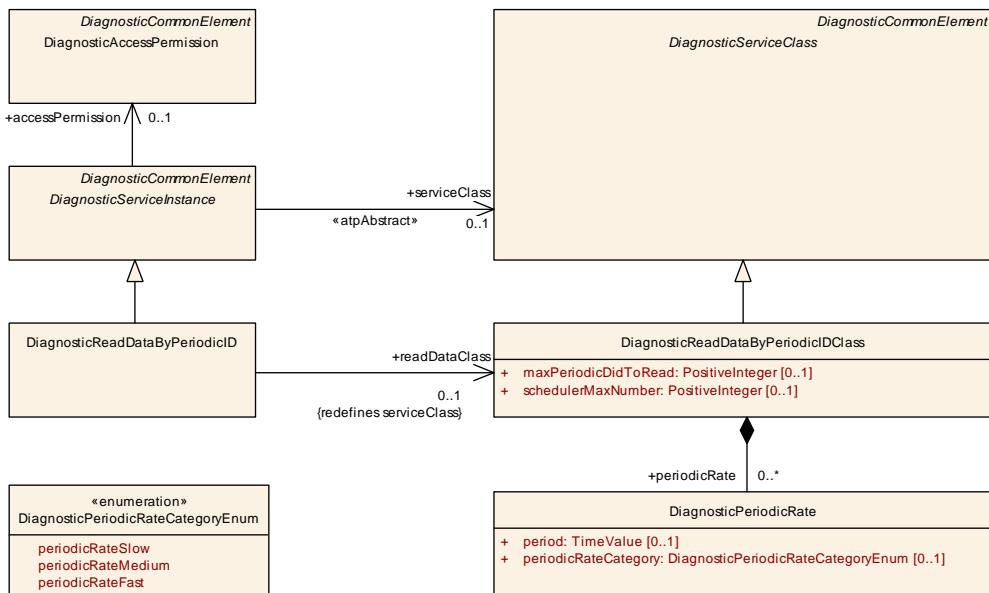


Figure 5.20: Modeling of diagnostic service `ReadDataByPeriodicIdentifier` (0x2A)

[constr_1338] Maximum number of aggregated `DiagnosticReadDataByPeriodicIDClass.periodicRate` [The number of aggregated `periodicRate` within the context of one `DiagnosticReadDataByPeriodicIDClass` shall be within the closed interval 1..3.]()

Class	DiagnosticReadDataByPeriodicID			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID			
Note	This represents an instance of the "Read Data by periodic Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticReadDataByPeriodicIDs			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
readDataClass	DiagnosticReadDataByPeriodicIDClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadDataByPeriodicID in the given context.</p>

Table 5.62: DiagnosticReadDataByPeriodicID

Class	DiagnosticReadDataByPeriodicIDClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID			
Note	This meta-class contains attributes shared by all instances of the "Read Data by periodic Identifier" diagnostic service. Tags: atp.recommendedPackage=DiagnosticReadDataByPeriodicIDs			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
maxPeriodicDidToRead	PositiveInteger	0..1	attr	This represents the maximum number of data identifiers that can be included in one request.
periodicRate	DiagnosticPeriodicRate	*	aggr	This represents the description of a collection of periodic rates in which the service can be executed.
schedulerMaxNumber	PositiveInteger	0..1	attr	This represents the maximum number of periodic data identifiers that can be scheduled in parallel.

Table 5.63: DiagnosticReadDataByPeriodicIDClass

[constr_1810] Existence of aggregation `DiagnosticReadDataByPeriodicID-Class.periodicRate` [For each `DiagnosticReadDataByPeriodicIDClass`, the aggregation of `DiagnosticPeriodicRate` in the role `periodicRate` shall exist at least once **at the time when the DEXT is complete.**.]()

[constr_1811] Existence of attribute `DiagnosticReadDataByPeriodicID-Class.maxPeriodicDidToRead` [For each `DiagnosticReadDataByPeriodicIDClass`, the attribute `maxPeriodicDidToRead` shall exist at least once **at the time when the DEXT is complete.**.]()

[constr_1812] Existence of attribute `DiagnosticReadDataByPeriodicID-Class.schedulerMaxNumber` [For each `DiagnosticReadDataByPeriodicIDClass`, the attribute `schedulerMaxNumber` shall exist at least once **at the time when the DEXT is complete.**.]()

Class	DiagnosticPeriodicRate			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID			
Note	This represents the ability to define a periodic rate for the specification of the "read data by periodic ID" diagnostic service.			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
period	TimeValue	0..1	attr	This represents the period of the DiagnosticPeriodicRate in seconds.
periodicRateCategory	DiagnosticPeriodicRateCategoryEnum	0..1	attr	This attribute represents the category of the periodic rate.

Table 5.64: DiagnosticPeriodicRate

[constr_1763] Existence of attribute `DiagnosticPeriodicRate.periodicRateCategory` [For each `DiagnosticPeriodicRate`, the attribute `periodicRateCategory` shall exist **at the time when the DEXT is complete.**.]()

Enumeration	DiagnosticPeriodicRateCategoryEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID
Note	This meta-class provides possible values for the setting of the periodic rate.
Literal	Description
periodicRateFast	This value represents a fast periodic rate. Tags: atp.EnumerationLiteralIndex=0
periodicRateMedium	This value represents a medium periodic rate. Tags: atp.EnumerationLiteralIndex=1
periodicRateSlow	This value represents a slow periodic rate. Tags: atp.EnumerationLiteralIndex=2

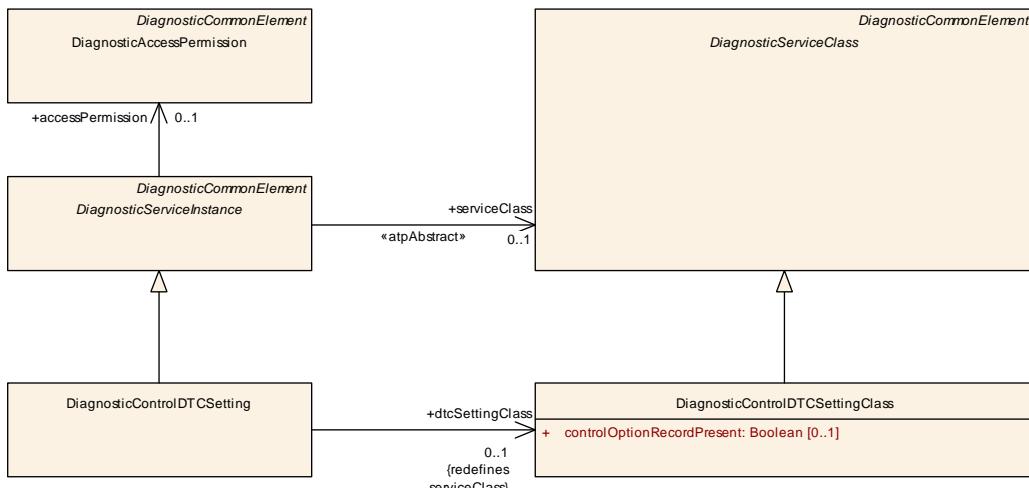
Table 5.65: DiagnosticPeriodicRateCategoryEnum

The meaning of the values defined in `DiagnosticPeriodicRateCategoryEnum` is described in the applicable ISO document [16].

5.5.9 ControlDTCSetting

This chapter describes the modeling of diagnostic services `ControlDTCSetting` (0x85). The purpose of the diagnostic service is to let the tester tell the diagnostic stack to either stop or resume the updating of a diagnostic trouble code.

[TPS_DEXT_01075] standardized values for the attribute `DiagnosticControlDTCSetting.category` [AUTOSAR does not standardize any of the possible values for the attribute `DiagnosticControlDTCSetting.category`.] (*RS_DEXT_00001, RS_DEXT_00021, RS_DEXT_00051*)


Figure 5.21: Modeling of diagnostic service ControlDTCSetting (0x85)

Class	DiagnosticControlDTCSetting			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ControlDTCSetting			
Note	This represents an instance of the "Control DTC Setting" diagnostic service. Tags: atp.recommendedPackage=DiagnosticControlDtcSettings			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceInstance</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dtcSettingClass	<i>DiagnosticControlDTCSettingClass</i>	0..1	ref	<p>This reference substantiates that abstract reference in the role <i>serviceClass</i> for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all <i>DiagnosticControlDTCSetting</i> in the given context.</p>

Table 5.66: DiagnosticControlDTCSetting

Class	DiagnosticControlDTCSettingClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ControlDTCSetting			
Note	This meta-class contains attributes shared by all instances of the "Control DTC Setting" diagnostic service. Tags: atp.recommendedPackage=DiagnosticControlDtcSettings			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceClass</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
controlOptionRecordPresent	Boolean	0..1	attr	This represents the decision whether the DTCSetting ControlOptionRecord (see ISO 14229-1) is in general supported in the request message.

Table 5.67: DiagnosticControlDTCSettingClass

5.5.10 ResponseOnEvent

This chapter describes the modeling of diagnostic services ResponseOnEvent (0x86). The purpose of this service is to instruct the AUTOSAR diagnostic stack with respect to the starting or stopping of sending responses to a specific event to the tester.

Each [DiagnosticResponseOnEvent](#) provides the ability to define a collection of triggers (modelled by means of the abstract meta-class [DiagnosticResponseOnEventTrigger](#)) that cause the sending of a response message.

The actual trigger behavior is defined by the sub-class of [DiagnosticResponseOnEventTrigger](#) used to specify whether the trigger shall be created in response to a data change or in response to a DTC change.

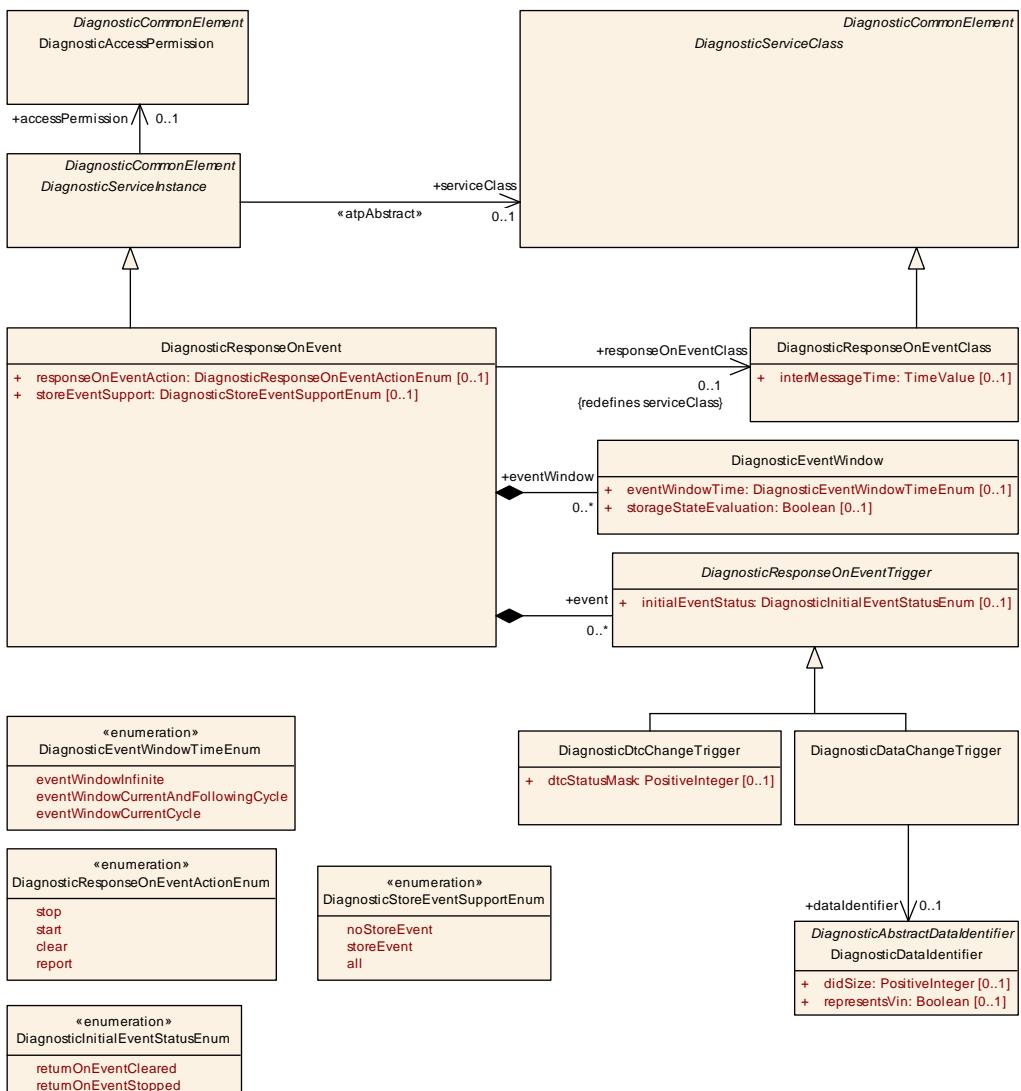


Figure 5.22: Modeling of diagnostic service ResponseOnEvent (0x86)

[TPS_DEXT_01033] Semantics of triggers in the context of a [DiagnosticResponseOnEvent](#) [The semantics of a trigger in the context of a [DiagnosticResponseOnEvent](#) can be defined in two ways:

- The meta-class [DiagnosticDataChangeTrigger](#) allows for defining a trigger that activates on the change of the value of the referenced (in the role [dataIdentifier](#)) [DiagnosticDataIdentifier](#).
- The meta-class [DiagnosticDtcChangeTrigger](#) allows for defining a trigger for the activation of the service. The entire proceedings of how the trigger activates and what DTCs are affected are managed at run-time and therefore no further configuration is required at this point.

」([RS_DEXT_00022](#))

[constr_1365] Multiplicity of [DiagnosticResponseOnEvent.event](#) [The multiplicity of [DiagnosticResponseOnEvent.event](#) shall not exceed the upper bound 255.]()

[constr_1366] Event ID in the context of diagnostic service [ResponseOnEvent](#) shall be unique [The value of [DiagnosticResponseOnEvent.event.dataIdentifier.id](#) shall be unique within the context of a given [DiagnosticResponseOnEvent](#).]()

[constr_1633] Existence of [DiagnosticResponseOnEvent.event](#) vs. [DiagnosticResponseOnEvent.responseOnEventAction](#) [The existence of attributes [DiagnosticResponseOnEvent.event](#) vs. [DiagnosticResponseOnEvent.responseOnEventAction](#) is mutually exclusive, i.e. one shall only exist if the other does not exist.]()

Class	DiagnosticResponseOnEvent			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents an instance of the "Response on Event" diagnostic service. Tags: atp.recommendedPackage=DiagnosticResponseOnEvents			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceInstance , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
event	DiagnosticResponseOnEventTrigger	*	aggr	This represents the collection of DiagnosticResponseOnEventTriggers defined in the context of the enclosing DiagnosticResponseOnEvent.
eventWindow	DiagnosticEventWindow	*	aggr	This represents the applicable DiagnosticEventWindows
responseOnEventAction	DiagnosticResponseOnEventActionEnum	0..1	attr	Defines sub-functions of the service ResponseOnEvent.
responseOnEventClass	DiagnosticResponseOnEventClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticResponseOnEvent in the given context.
storeEventSupport	DiagnosticStoreEventSupportEnum	0..1	attr	Defines how a specific event shall be handled.

Table 5.68: [DiagnosticResponseOnEvent](#)

Class	DiagnosticResponseOnEventClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define common properties for all instances of the "Response on Event" diagnostic service. Tags: atp.recommendedPackage=DiagnosticResponseOnEvents			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
interMessage Time	TimeValue	0..1	attr	Provide the minimum time in seconds between two consecutive transmissions of an ROE event.

Table 5.69: DiagnosticResponseOnEventClass

Class	DiagnosticEventWindow			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define the characteristics of the applicable event window			
Base	<i>ARObject</i>			
Attribute	Type	Mult.	Kind	Note
eventWindow Time	DiagnosticEventWindow TimeEnum	0..1	attr	This attribute clarifies the validity of the eventWindow
storageState Evaluation	Boolean	0..1	attr	If this attribute is set to TRUE the StorageStateBit will be evaluated if this EventWindowTime is requested.

Table 5.70: DiagnosticEventWindow

[constr_1813] Existence of reference *DiagnosticEventWindow.eventWindow-Time* [For each *DiagnosticEventWindow*, attribute *eventWindowTime* shall exist at the time when the DEXT is complete.]()

[constr_1814] Existence of reference *DiagnosticEventWindow.storageStateEvaluation* [For each *DiagnosticEventWindow*, attribute *storageStateEvaluation* shall exist at the time when the DEXT is complete.]()

Class	DiagnosticResponseOnEventTrigger (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to further specify the events that are associated with the execution of the diagnostic service.			
Base	<i>ARObject</i>			
Subclasses	<i>DiagnosticDataChangeTrigger, DiagnosticDtcChangeTrigger</i>			
Attribute	Type	Mult.	Kind	Note
initialEvent Status	DiagnosticInitialEvent StatusEnum	0..1	attr	This represents the initial status of the enclosing DiagnosticResponseOnEventTrigger.

Table 5.71: DiagnosticResponseOnEventTrigger

Class	DiagnosticDataChangeTrigger			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define a trigger based on the change of a given DiagnosticDataIdentifier.			
Base	ARObject, <i>DiagnosticResponseOnEventTrigger</i>			
Attribute	Type	Mult.	Kind	Note
dataIdentifier	DiagnosticDataIdentifier	0..1	ref	This represents the corresponding DiagnosticData Identifier.

Table 5.72: DiagnosticDataChangeTrigger

Class	DiagnosticDtcChangeTrigger			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define a trigger that executes on the change of any DiagnosticTroubleCode.			
Base	ARObject, <i>DiagnosticResponseOnEventTrigger</i>			
Attribute	Type	Mult.	Kind	Note
dtcStatusMask	PositiveInteger	0..1	attr	This attribute represents the ability to define a status mask for the triggering of an ROE response on the change of a DTC.

Table 5.73: DiagnosticDtcChangeTrigger

Enumeration	DiagnosticInitialEventStatusEnum			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define an initial status for the ROE service.			
Literal	Description			
returnOnEvent Cleared	This means that the ResponseOnEvent is initially cleared. Tags: atp.EnumerationLiteralIndex=0			
returnOnEvent Stopped	This means that the ResponseOnEvent is initially stopped. Tags: atp.EnumerationLiteralIndex=1			

Table 5.74: DiagnosticInitialEventStatusEnum

Enumeration	DiagnosticEventWindowTimeEnum			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent			
Note	This represents the ability to define the semantics of the event window.			
Literal	Description			
eventWindow CurrentAnd FollowingCycle	This means that the window extends to this and the following cycle. Tags: atp.EnumerationLiteralIndex=0			
eventWindow CurrentCycle	This means that the window is limited to the current cycle. Tags: atp.EnumerationLiteralIndex=1			
eventWindowInfinite	This means that the window extends without a border. Tags: atp.EnumerationLiteralIndex=2			

Table 5.75: DiagnosticEventWindowTimeEnum

Enumeration	DiagnosticStoreEventSupportEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent
Note	This meta-class has the ability to define how a specific event in the context of the UDS service ResponseOnEvent shall be handled.
Literal	Description
all	The server supports both, storing and not storing the event. Tags: atp.EnumerationLiteralIndex=2
noStoreEvent	The event terminates when the server is powered down. Tags: atp.EnumerationLiteralIndex=0
storeEvent	The event is persisted over a power down cycle. Tags: atp.EnumerationLiteralIndex=1

Table 5.76: DiagnosticStoreEventSupportEnum

Enumeration	DiagnosticResponseOnEventActionEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent
Note	This meta-class has the ability to define sub-functions of the UDS service ResponseOnEvent.
Literal	Description
clear	Clears the configured events. Tags: atp.EnumerationLiteralIndex=2
report	Reports the activated events. Tags: atp.EnumerationLiteralIndex=3
start	Starts the response on event service. Tags: atp.EnumerationLiteralIndex=1
stop	Stops the response on event service. Tags: atp.EnumerationLiteralIndex=0

Table 5.77: DiagnosticResponseOnEventActionEnum

5.5.11 ReadDTCInformation

This chapter describes the modeling of diagnostic services `ReadDTCInformation` (0x19). The purpose of this service is to enable a tester to read a Diagnostic Trouble Code from the AUTOSAR Dcm [10] (that, in turn, fetches the information from the AUTOSAR Dem [11]).

[TPS_DEXT_01034] Sub-functions of the service `ReadDTCInformation` [The diagnostics service `ReadDTCInformation` defines a number of sub-functions that are, as far as the modeling in AUTOSAR goes, identified by a textual identifier.

These sub-functions are **not** modeled explicitly but can be specified by defining a `DiagnosticReadDTCInformation` and by setting the `DiagnosticReadDTCInformation.category` to the identifier of the respective sub-function.

The possible values, as far as the AUTOSAR standard is concerned, are defined by **[TPS_DEXT_01060].** (RS_DEXT_00006, RS_DEXT_00051)



Figure 5.23: Modeling of diagnostic service ReadDTCInformation (0x19)

[TPS_DEXT_01060] Applicable values for [DiagnosticReadDTCInformation.category](#) [The following values of the attribute [DiagnosticReadDTCInformation.category](#) are standardized by AUTOSAR:

- REPORT_NUMBER_OF_DTC_BY_STATUS_MASK
- REPORT_DTC_BY_STATUS_MASK
- REPORT_MIRROR_MEMORY_DTC_BY_STATUS_MASK
- REPORT_NUMBER_OF_MIRROR_MEMORY_DTC_BY_STATUS_MASK
- REPORT_NUMBER_OF_EMISSIONS_OBD_DTC_BY_STATUS_MASK
- REPORT_EMISSIONS_OBD_DTC_BY_STATUS_MASK
- REPORT_DTC_SNAPSHOT_IDENTIFICATION
- REPORT_DTC_SNAPSHOT_RECORD_BY_DTC_NUMBER
- REPORT_DTC_STORED_DATA_BY_RECORD_NUMBER
- REPORT_DTC_EXT_DATA_RECORD_BY_DTC_NUMBER
- REPORT_MIRROR_MEMORY_DTC_EXT_DATA_RECORD_BY_DTC_NUMBER
- REPORT_NUMBER_OF_DTC_BY_SEVERITY_MASK_RECORD
- REPORT_DTC_BY_SEVERITY_MASK_RECORD
- REPORT_SEVERITY_INFORMATION_OF_DTC
- REPORT_SUPPORTED_DTC
- REPORT_FIRST_TEST_FAILED_DTC
- REPORT_FIRST_CONFIRMED_DTC
- REPORT_MOST_RECENT_TEST_FAILED_DTC
- REPORT_MOST_RECENT_CONFIRMED_DTC

- REPORT_DTC_FAULT_DETECTION_COUNTER
- REPORT_DTC_WITH_PERMANENT_STATUS
- REPORT_DTC_EXT_DATA_RECORD_BY_RECORD_NUMBER
- REPORT_USER_DEF_MEMORY_DTC_BY_STATUS_MASK
- REPORT_USER_DEF_MEMORY_DTC_SNAPSHOT_RECORD_BY_DTC_NUMBER
- REPORT_USER_DEF_MEMORY_DTC_EXT_DATA_RECORD_BY_DTC_NUMBER
- REPORT_WWH_OBD_DTC_BY_MASK_RECORD
- REPORT_WWH_OBD_DTC_WITH_PERMANENT_STATUS

The meanings of these values are described in the applicable ISO document (ISO 14229-1) [16].] ([RS_DEXT_00001](#), [RS_DEXT_00006](#), [RS_DEXT_00051](#))

Please note that there is nothing to configure for [DiagnosticReadDTCInformation](#) beyond its mere existence.

Class	DiagnosticReadDTCInformation			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDTCInformation			
Note	This represents an instance of the "Read DTC Information" diagnostic service. Tags: atp.recommendedPackage=DiagnosticReadDtclInformations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
read DTCInformation Class	DiagnosticReadDTCInformationClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticReadDTCInformation in the given context.</p>

Table 5.78: DiagnosticReadDTCInformation

Class	DiagnosticReadDTCInformationClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::ReadDTCInformation			
Note	This meta-class contains attributes shared by all instances of the "ReadDTCInformation" diagnostic service. Tags: atp.recommendedPackage=DiagnosticReadDtclInformations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.79: DiagnosticReadDTCInformationClass

5.5.12 RoutineControl

This chapter describes the modeling of diagnostic services RoutineControl (0x31). The purpose of this diagnostic service is to execute a piece of code, a Diagnostic Routine, on the diagnostic stack at the request of the tester.

Diagnostic Routines consist of up to three possible components:

- Start Routine
- Stop Routine
- Request Routine Results

The impact of this architecture on the meta-model is described by [TPS_DEXT_01077]:

[TPS_DEXT_01077] Modeling of DiagnosticRoutine [From the meta-modeling point of view, the semantics of DiagnosticRoutine is created by aggregating three further meta-classes that represent subfunctions of service RoutineControl (0x31):

- DiagnosticStartRoutine
- DiagnosticStopRoutine
- DiagnosticRequestRoutineResults

] (RS_DEXT_00015)

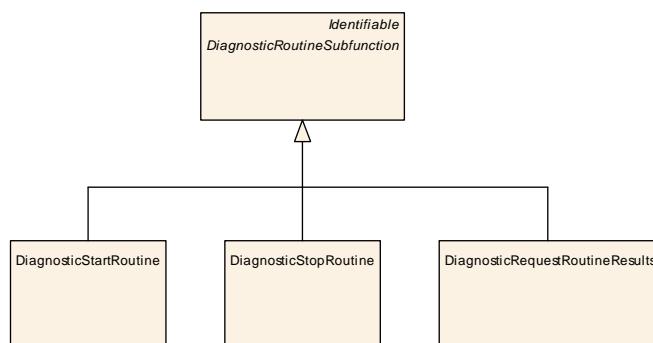


Figure 5.24: Abstract base class for subfunctions of diagnostic service RoutineControl (0x31)

Class	<i>DiagnosticRoutineSubfunction</i> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class acts as an abstract base class to routine subfunctions.			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Subclasses	<i>DiagnosticRequestRoutineResults</i> , <i>DiagnosticStartRoutine</i> , <i>DiagnosticStopRoutine</i>			
Attribute	Type	Mult.	Kind	Note
access Permission	<i>DiagnosticAccess Permission</i>	0..1	ref	This reference represents the access permission of the owning routine subfunction.

Table 5.80: DiagnosticRoutineSubfunction

[TPS_DEXT_01088] Semantics of `DiagnosticRoutine.id` [The attribute `DiagnosticRoutine.id` represents the so-called *identifier* of the `DiagnosticRoutine`.] ([RS_DEXT_00036](#))

[TPS_DEXT_01078] Not possible to use the attribute `category` for the identification of the sub-function of diagnostic service `RoutineControl` [In the case of `DiagnosticRoutine`, it is not possible to use the attribute `category` for the identification of the sub-function.] ([RS_DEXT_00015](#), [RS_DEXT_00051](#))

The sub-functions actually have different properties i.e. the arguments to a `DiagnosticRoutine` that require a dedicated modeling for this purpose.

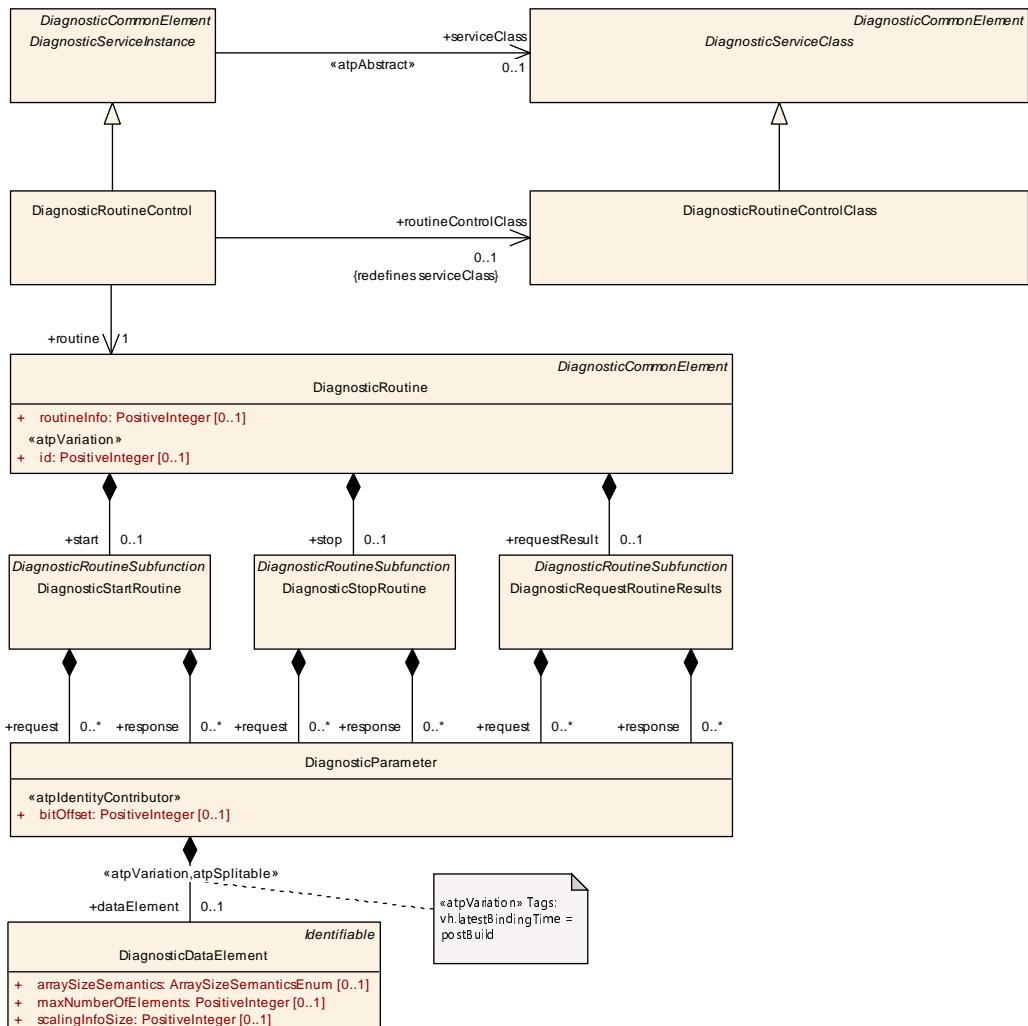


Figure 5.25: Modeling of diagnostic service `RoutineControl` (0x31)

[TPS_DEXT_01079] Modeling of the arguments to a `DiagnosticRoutine` [The arguments to a `DiagnosticRoutine` are modeled by means of `DiagnosticParameter` that is aggregated in the following roles:

- `DiagnosticStartRoutine.request`
- `DiagnosticStartRoutine.response`

- DiagnosticStopRoutine.request
- DiagnosticStopRoutine.response
- DiagnosticRequestRoutineResults.response
- DiagnosticRequestRoutineResults.request
- DiagnosticRequestRoutineResults.response

](*RS_DEXT_00015*)

A **DiagnosticParameter**, in turn, aggregates a **DiagnosticDataElement** (see section 4.2) in the role **dataElement**.

[TPS_DEXT_01080] Diagnostic Routine needs to be started [ISO 14229-1 [16] does not foresee the existence of a Diagnostic Routine that is already executing at boot time. Therefore, a Diagnostic Routine needs to be started at some point in order to make sense of it.] (*RS_DEXT_00015*)

[constr_1339] Existence of DiagnosticRoutine.start [In a complete **DiagnosticExtract**, the attribute **DiagnosticRoutine.start** shall always exist for any given **DiagnosticRoutine**.]()

[TPS_DEXT_01035] Existence of DiagnosticRoutine.stop and DiagnosticRoutine.requestResult [In contrast to **DiagnosticRoutine.start** (as clarified by [constr_1339]), the existence of **DiagnosticRoutine.stop** and **DiagnosticRoutine.requestResult** is truly optional.] (*RS_DEXT_00015*)

[constr_1340] Consistency of DiagnosticServiceSwMapping with respect to synchronously called DiagnosticRoutines [Each **DiagnosticServiceSwMapping** that references a **DiagnosticRoutineControl** that only aggregates a **DiagnosticStartRoutine** in the role **start** shall only reference a **SwcServiceDependency** or **BswServiceDependency** that in turn aggregates a **DiagnosticRoutineNeeds** with attribute **diagRoutineType** set to **DiagnosticRoutineTypeEnum.synchronous**.]()

[constr_1341] Consistency of DiagnosticServiceSwMapping with respect to asynchronously called DiagnosticRoutines [Each **DiagnosticServiceSwMapping** that references a **DiagnosticRoutineControl** that aggregates a **DiagnosticStopRoutine** and/or **DiagnosticRequestRoutineResults** in the role **stop** or **requestResult** shall only reference a **SwcServiceDependency** or **BswServiceDependency** that in turn aggregates a **DiagnosticRoutineNeeds** with attribute **diagRoutineType** set to **DiagnosticRoutineTypeEnum.asynchronous**.]()

[TPS_DEXT_01049] Consistency of DiagnosticServiceSwMapping with respect to routine IDs [For each **DiagnosticServiceSwMapping** that references a **DiagnosticRoutineNeeds** and a **DiagnosticRoutineControl**, the value of **DiagnosticRoutineNeeds.ridNumber** shall be ignored and the value of **DiagnosticRoutineControl.routine.id** shall be taken instead.] (*RS_DEXT_00015*, *RS_DEXT_00052*)

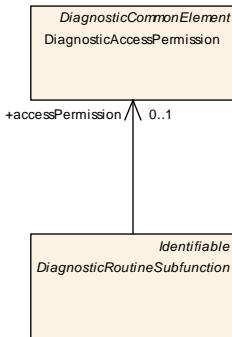


Figure 5.26: Permission is granted per subfunction

The `DiagnosticRoutineControl` service is the only UDS service with both subfunction and identifier. ISO 14229-1 [16] treats the service with respect to session and security as a service with identifier.

In other words a `DiagnosticRoutine`—with its three subfunctions `start`, `stop` and `requestResult`—for the same identifier can have only `DiagnosticAccessPermission` with the same referenced `DiagnosticSession` and `DiagnosticSecurityLevel`.

However, different `DiagnosticEnvironmentalConditions` may exist for the subfunctions of a `DiagnosticRoutine` with the same identifier (`DiagnosticRoutine.id`).

[constr_1772] Unique `DiagnosticSession` and `DiagnosticSecurityLevel` for diagnostic routines that have the same identifier [All `DiagnosticAccessPermissions` referenced from `DiagnosticRoutines` where attribute `DiagnosticRoutine.id` has the identical value shall refer to the identical set of `DiagnosticSession` and `DiagnosticSecurityLevel`.]()

For this purpose, the reference from the abstract base class¹ `DiagnosticRoutineSubfunction` to `DiagnosticAccessPermission` in the role `accessPermission` exists (see Figure 5.26).

Consequently, the reference from meta-class `DiagnosticRoutineControl` (via its abstract base class `DiagnosticServiceInstance`) to meta-class `DiagnosticAccessPermission` has no meaning.

[constr_1612] Reference from `DiagnosticRoutineControl` to `DiagnosticAccessPermission` has no meaning [The reference from `DiagnosticRoutineControl` (via its abstract base class `DiagnosticServiceInstance`) in the role `accessPermission` to meta-class `DiagnosticAccessPermission` shall not be used.]()

¹of meta-classes `DiagnosticStartRoutine`, `DiagnosticStopRoutine`, and `DiagnosticRequestRoutineResults`

Class	DiagnosticRoutine			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to define a diagnostic routine. Tags: atp.recommendedPackage=DiagnosticRoutines			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	0..1	attr	<p>This is the numerical identifier used to identify the DiagnosticRoutine in the scope of diagnostic workflow</p> <p>Stereotypes: atpVariation</p> <p>Tags:vh.latestBindingTime=preCompileTime</p>
requestResult	DiagnosticRequest RoutineResults	0..1	aggr	This represents the ability to request the result of a running routine.
routineInfo	PositiveInteger	0..1	attr	<p>This represents the routine info byte. The info byte contains a manufacturer-specific value (for the identification of record identifiers) that is reported to the tester.</p> <p>Other use cases for this attribute are mentioned in ISO 27145 and ISO 26021.</p>
start	DiagnosticStartRoutine	0..1	aggr	This represents the ability to start a routine
stop	DiagnosticStopRoutine	0..1	aggr	This represents the ability to stop a running routine.

Table 5.81: DiagnosticRoutine

[constr_1815] Existence of attribute *DiagnosticRoutine.id* [For each *DiagnosticRoutine*, the attribute *id* shall exist at least once **at the time when the DEXT is complete.**] ()

Class	DiagnosticStartRoutine			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This represents the ability to start a diagnostic routine.			
Base	ARObject, DiagnosticRoutineSubfunction, Identifiable, MultilanguageReferrable, Referrable			
Attribute	Type	Mult.	Kind	Note
request	DiagnosticParameter	*	aggr	This represents the request parameters.
response	DiagnosticParameter	*	aggr	This represents the response parameters.

Table 5.82: DiagnosticStartRoutine

Class	DiagnosticStopRoutine			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This represents the ability to stop a diagnostic routine.			
Base	ARObject, DiagnosticRoutineSubfunction, Identifiable, MultilanguageReferrable, Referrable			
Attribute	Type	Mult.	Kind	Note
request	DiagnosticParameter	*	aggr	This represents the request parameters.
response	DiagnosticParameter	*	aggr	This represents the response parameters.

Table 5.83: DiagnosticStopRoutine

Class	DiagnosticRequestRoutineResults			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to define the result of a diagnostic routine execution.			
Base	ARObject, <i>DiagnosticRoutineSubfunction</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
request	DiagnosticParameter	*	aggr	This represents the request parameters.
response	DiagnosticParameter	*	aggr	This represents the response parameters.

Table 5.84: DiagnosticRequestRoutineResults

Class	DiagnosticRoutineControl			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::RoutineControl			
Note	This represents an instance of the "Routine Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticRoutineControls			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceInstance</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
routine	DiagnosticRoutine	1	ref	This refers to the applicable DiagnosticRoutine.
routineControl Class	DiagnosticRoutine ControlClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRoutineControl in the given context.

Table 5.85: DiagnosticRoutineControl

Class	DiagnosticRoutineControlClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::RoutineControl			
Note	This meta-class contains attributes shared by all instances of the "Routine Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticRoutineControls			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticServiceClass</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.86: DiagnosticRoutineControlClass

Class	DiagnosticRoutineNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the general needs on the configuration of the Diagnostic Communication Manager (Dcm) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the Dcm which are not related to a particular item.			
Base	ARObject, <i>DiagnosticCapabilityElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i> , <i>Service Needs</i>			
Attribute	Type	Mult.	Kind	Note
diagRoutine Type	DiagnosticRoutineType Enum	0..1	attr	This denotes the type of diagnostic routine which is implemented by the referenced server port.





Class	DiagnosticRoutineNeeds			
ridNumber	PositiveInteger	0..1	attr	This represents a routine identifier for the diagnostic routine. This allows to predefine the RID number if the a function developer has received a particular requirement from the OEM or from a standardization body.

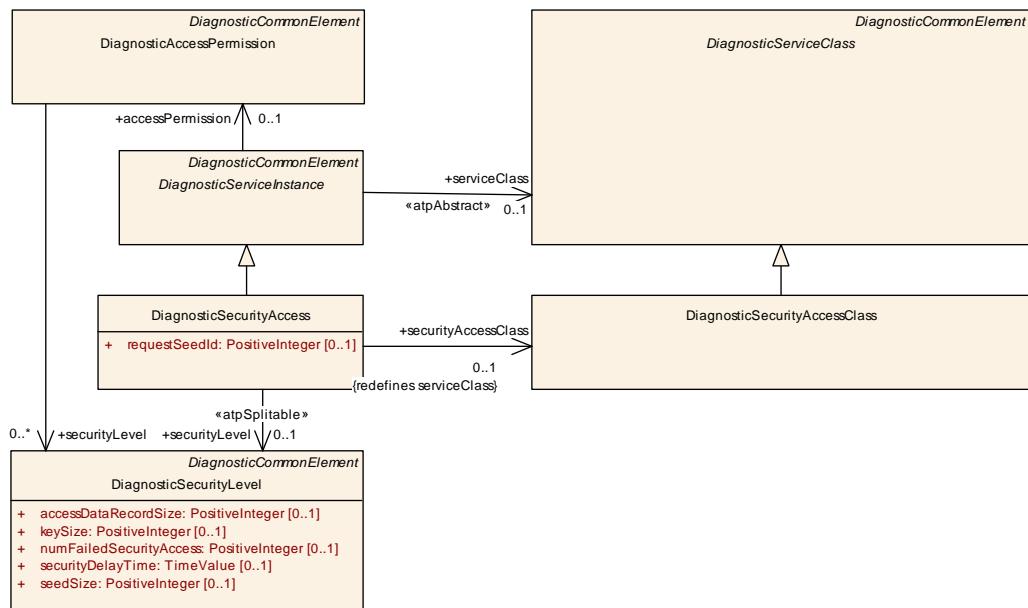
Table 5.87: DiagnosticRoutineNeeds

Enumeration	DiagnosticRoutineTypeEnum
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds
Note	This enumerator specifies the different types of diagnostic routines.
Literal	Description
asynchronous	This indicates that the diagnostic server is not blocked while the diagnostic routine is running. Tags: atp.EnumerationLiteralIndex=0
synchronous	This indicates that the diagnostic routine blocks the diagnostic server in the ECU while the routine is running. Tags: atp.EnumerationLiteralIndex=1

Table 5.88: DiagnosticRoutineTypeEnum

5.5.13 SecurityAccess

This chapter describes the modeling of diagnostic services **SecurityAccess** (0x27).


Figure 5.27: Modeling of diagnostic service SecurityAccess (0x27)

[TPS_DEXT_01053] Existence of **DiagnosticSecurityAccess.securityLevel**
 [The configuration of a given **DiagnosticSecurityAccess** is considered incomplete until the reference in the role **DiagnosticSecurityAccess.securityLevel** exists.] ([RS_DEXT_00009](#), [RS_DEXT_00042](#))

The meaning of [TPS_DEXT_01053] is that the reference may be missing in intermediate steps of the configuration work flow. But at the point in time when ECU configuration is generated from the [DiagnosticExtract](#) the reference is needed to able to make sense of the model for the given [DiagnosticSecurityAccess](#).

Please note that (as already explained in section 5.5) the sub-functions of this service are modeled by means of the [category](#) attribute.

In response to conceptual differences between many other diagnostic services and [SecurityAccess](#), the applicable sub-functions for the diagnostic service [SecurityAccess](#) are **not** defined by means of the attribute [DiagnosticSecurityAccess.category](#).

[TPS_DEXT_01036] Work-flow within the execution of the diagnostic service [SecurityAccess](#) [The work-flow within the execution of the diagnostic service [SecurityAccess](#) basically boils down to the tester sending the request to obtain a *seed* from the diagnostic stack and then sending back a *key* to the stack.]

Thus, the sub-functions could be generically be described as *requestSeed* and *sendKey*, which is precisely what the ISO 14229-1 [16] does.

According to this logic, the *requestSeed* could get a specific number assigned to identify the sub-function and then the *sendKey* sub-function would get assigned the number of the *requestSeed* sub-function + 1. Again, this is fully in line with the ISO 14229-1 [16].] ([RS_DEXT_00009](#))

However, there is further dimension to take into account, namely the [DiagnosticSecurityLevel](#). According to ISO 14229-1 [16], different security levels make different numbers for the sub-function identifier.

[TPS_DEXT_01037] Semantics of [DiagnosticSecurityAccess.requestSeedId](#) [The attribute [DiagnosticSecurityAccess.requestSeedId](#) shall be used to define the number of the sub-function of the diagnostic service [SecurityAccess](#) according to the intended security level.] ([RS_DEXT_00009](#))

[constr_1342] Possible values for [DiagnosticSecurityAccess.requestSeedId](#) [The value of the attribute [DiagnosticSecurityAccess.requestSeedId](#) shall only be set to an odd number².

The supported value range consists of the following list:

- all odd numbers in the closed interval **0x01 .. 0x41**
- **0x5F** (this corresponds to the case of *end-of-life activation of on-board pyrotechnic devices according to ISO 26021-2 [17]*)
- all odd numbers in the closed interval **0x61 .. 0x7E**

]()

²The even numbers are reserved for the identification of the corresponding *sendKey* sub-function, as explained by [TPS_DEXT_01036].

In contrast to a similar situation in the case of the diagnostic service `SessionControl` (see section 5.5.14), there is no real evidence that a `DiagnosticSecurityLevel` always exists before the referencing `DiagnosticSecurityAccess` is created in order to properly establish the reference in the role `DiagnosticSecurityAccess.securityLevel`.

[TPS_DEXT_01038] Motivation for making the reference `DiagnosticSecurityAccess.securityLevel` «atpSplitable» [The reference `DiagnosticSecurityAccess.securityLevel` needs to be decorated with the stereotype «atpSplitable» in order to advertise the idea that the reference to a corresponding `DiagnosticSecurityLevel` is created (potentially in a different artifact) some time after the actual creation of the given `DiagnosticSecurityAccess`.] (*RS_DEXT_00001, RS_DEXT_00009, RS_DEXT_00042*)

Of course, if the `DiagnosticSecurityLevel` factually exists before the definition of `DiagnosticSecurityAccess` the reference can directly be inserted into the model.

Class	<code>DiagnosticSecurityAccess</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::SecurityAccess			
Note	This represents an instance of the "Security Access" diagnostic service. Tags: atp.recommendedPackage=DiagnosticSecurityAccess			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
requestSeedId	PositiveInteger	0..1	attr	<p>This would be 0x01, 0x03, 0x05, ...</p> <p>The sendKey id can be computed by adding 1 to the requestSeedId</p>
securityAccess Class	<code>DiagnosticSecurityAccessClass</code>	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticSecurityAccess</code> in the given context.</p>
securityLevel	<code>DiagnosticSecurityLevel</code>	0..1	ref	<p>This reference identifies the applicable security level for the security access.</p> <p>Stereotypes: atpSplitable Tags:atp.Splitkey=securityLevel</p>

Table 5.89: `DiagnosticSecurityAccess`

[constr_1816] Existence of attribute `DiagnosticSecurityAccess.requestSeedId` [For each `DiagnosticSecurityAccess`, the attribute `requestSeedId` shall exist at least once **at the time when the DEXT is complete.**] ()

[constr_1817] Existence of attribute `DiagnosticSecurityAccess.securityLevel` [For each `DiagnosticSecurityAccess`, the attribute `securityLevel` shall exist at least once **at the time when the DEXT is complete.**] ()

Class	DiagnosticSecurityAccessClass								
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::SecurityAccess								
Note	This meta-class contains attributes shared by all instances of the "Security Access" diagnostic service. Tags: atp.recommendedPackage=DiagnosticSecurityAccess								
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>								
Attribute	<table border="1"> <thead> <tr> <th>Type</th> <th>Mult.</th> <th>Kind</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>—</td> <td>—</td> <td>—</td> <td>—</td> </tr> </tbody> </table>	Type	Mult.	Kind	Note	—	—	—	—
Type	Mult.	Kind	Note						
—	—	—	—						

Table 5.90: DiagnosticSecurityAccessClass

5.5.14 SessionControl

This chapter describes the modeling of diagnostic services SessionControl (0x10). The obvious goal of the service is to support the switching from one diagnostic session to another.

[TPS_DEXT_01081] Modeling of DiagnosticSessionControl [For the purpose of providing a means to specify the switching from one diagnostic session to another diagnostic session, `DiagnosticSessionControl` refers to a `DiagnosticSession` in the role `diagnosticSession`.] (*RS_DEXT_00003, RS_DEXT_00040*)

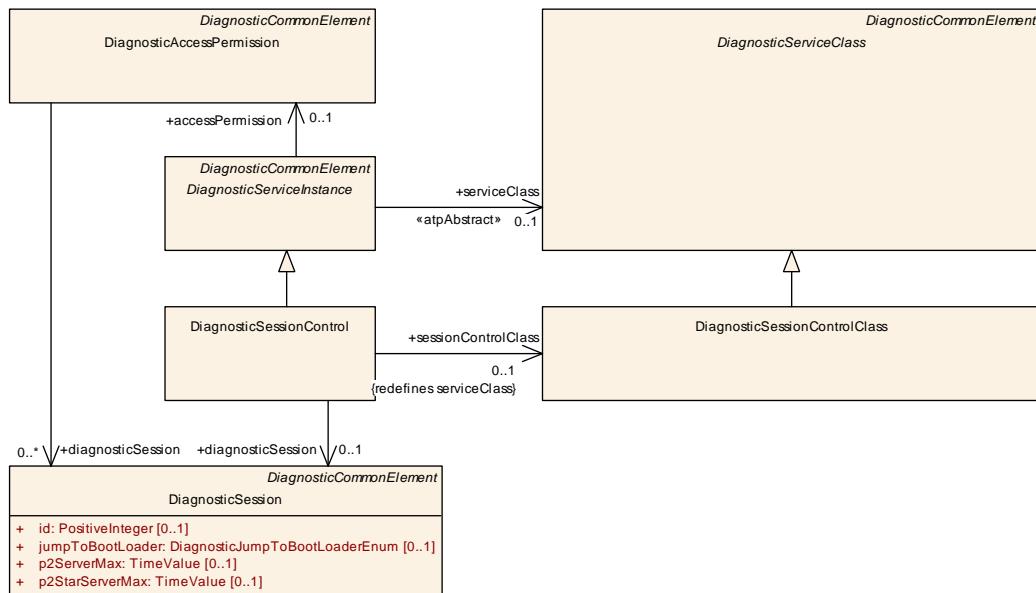


Figure 5.28: Modeling of diagnostic service SessionControl (0x10)

According to ISO 14229-1 [16], the diagnostic service SessionControl defines sub-functions.

[TPS_DEXT_01039] Identification of the sub-function of [DiagnosticSessionControl](#) [In the case of [DiagnosticSessionControl](#) it would not be a good idea

to encode the applicable sub-function by means of the attribute `DiagnosticSessionControl.category`.

Actually, the possible sub-functions are strongly related to the concept of the diagnostic session, represented by the meta-class `DiagnosticSession`.

The latter, in turn, has an attribute `id` that directly corresponds to the number of the applicable sub-function for `DiagnosticSessionControl`.

In other words, the sub-function of `DiagnosticSessionControl` is identified by means of the reference `DiagnosticSessionControl.diagnosticSession`.] (*RS_DEXT_00003, RS_DEXT_00051*)

[TPS_DEXT_01082] Existence of `DiagnosticSessionControl.diagnosticSession` [The idea of modeling the sub-function of `DiagnosticSessionControl` by means of the reference `DiagnosticSessionControl.diagnosticSession` implies that the applicable `DiagnosticSession` already exists at the time when the given `DiagnosticSessionControl` is created.

It is assumed that this will always be the case because the definition of `DiagnosticSessions` is part of laying the groundwork³ for diagnostic communication.] (*RS_DEXT_00003, RS_DEXT_00040*)

It is hard to foresee a scenario where the `DiagnosticSession`s are defined near the very end of the work-flow that leads to a complete `DiagnosticExtract`.

Class	<code>DiagnosticSessionControl</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::SessionControl			
Note	This represents an instance of the "Session Control" diagnostic service. Tags: atp.recommendedPackage=DiagnosticSessionControls			
Base	<code>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</code>			
Attribute	Type	Mult.	Kind	Note
diagnostic Session	<code>DiagnosticSession</code>	0..1	ref	This represents the applicable <code>DiagnosticSessions</code>
sessionControl Class	<code>DiagnosticSession ControlClass</code>	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticSessionControl</code> in the given context.

Table 5.91: `DiagnosticSessionControl`

[constr_1818] Existence of reference `DiagnosticSessionControl.diagnosticSession` [For each `DiagnosticSessionControl`, the reference to `DiagnosticSession` in the role `diagnosticSession` shall exist **at the time when the DEXT is complete.**] ()

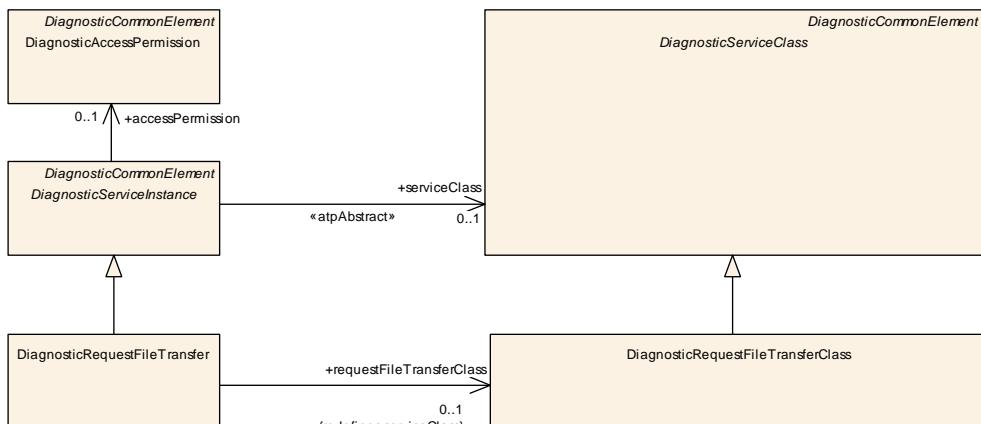
³This is similar to the definition of commonly used data types in a software development project

Class	DiagnosticSessionControlClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::SessionControl			
Note	This meta-class contains attributes shared by all instances of the "Session Control" diagnostic service.			
Tags	atp.recommendedPackage=DiagnosticSessionControls			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.92: DiagnosticSessionControlClass

5.5.15 RequestFileTransfer

This chapter describes the modeling of diagnostic services `RequestFileTransfer` (0x38). The purpose of the service is the triggering of the transfer of a *file* from or to the AUTOSAR diagnostic stack.


Figure 5.29: Modeling of diagnostic service RequestFileTransfer (0x38)

Please note that there is nothing to configure for `DiagnosticRequestFileTransfer` beyond its mere existence.

[TPS_DEXT_01090] Diagnostic service RequestFileTransfer does not define any sub-functions [The diagnostic service `RequestFileTransfer` does not define any sub-functions. therefore, the usage of the attribute `category` is not constrained for meta-class `DiagnosticRequestFileTransfer`.] ([RS_DEXT_00057](#))

Class	DiagnosticRequestFileTransfer
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::RequestFileTransfer
Note	This diagnostic service instance implements the UDS service 0x38. Tags:atp.recommendedPackage=DiagnosticRequestFileTransfers





Class	DiagnosticRequestFileTransfer			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
requestFileTransferClass	DiagnosticRequestFileTransferClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestFileTransfer in the given context.</p>

Table 5.93: DiagnosticRequestFileTransfer

Class	DiagnosticRequestFileTransferClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::DiagnosticService::RequestFileTransfer			
Note	This meta-class contains attributes shared by all instances of the "Request File transfer" diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestFileTransfers			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.94: DiagnosticRequestFileTransferClass

5.6 OBD Diagnostic Services supported by AUTOSAR

Support for diagnostic services for on-board diagnostics (OBD) [18] requires the definition of further meta-classes similar to e.g. [DiagnosticDataIdentifier](#) or [DiagnosticRoutine](#).

[TPS_DEXT_01092] Semantics of [DiagnosticParameterIdentifier](#) [The meta-class [DiagnosticParameterIdentifier](#) is used to reflect the concept of the so-called Parameter Identifiers (PID) in the diagnostic extract. A [DiagnosticParameterIdentifier](#) defines the following properties:

- Each [DiagnosticParameterIdentifier](#) gets a numerical ID carried in the attribute [DiagnosticParameterIdentifier.id](#).
- [DiagnosticParameterIdentifier](#) may also contain a so-called *Support Info Byte*, modeled as [DiagnosticSupportInfoByte](#).
- The definition of a [DiagnosticParameterIdentifier](#) also contains a list of data associated with the PID. This list is modeled as an aggregation of [DiagnosticParameter](#).

]([RS_DEXT_00068](#))

As already mentioned in [\[TPS_DEXT_01092\]](#), the [DiagnosticParameterIdentifier](#) shall not be confused with the [DiagnosticParameter](#). The latter is used

“inside” the definition of `DiagnosticParameterIdentifier`, but also in `DiagnosticDataIdentifier` or `DiagnosticRoutine`, to define one (out of potentially many) piece of information held in the scope of a `DiagnosticParameterIdentifier`.

[constr_1447] Restrictions for the value of [DiagnosticParameterIdentifier](#).

id [The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of [DiagnosticParameterIdentifier.id](#).]()

[constr_1448] Interval of DiagnosticParameterIdentifier.id [The allowed interval for values of DiagnosticParameterIdentifier.id shall not exceed [0..255].] ()

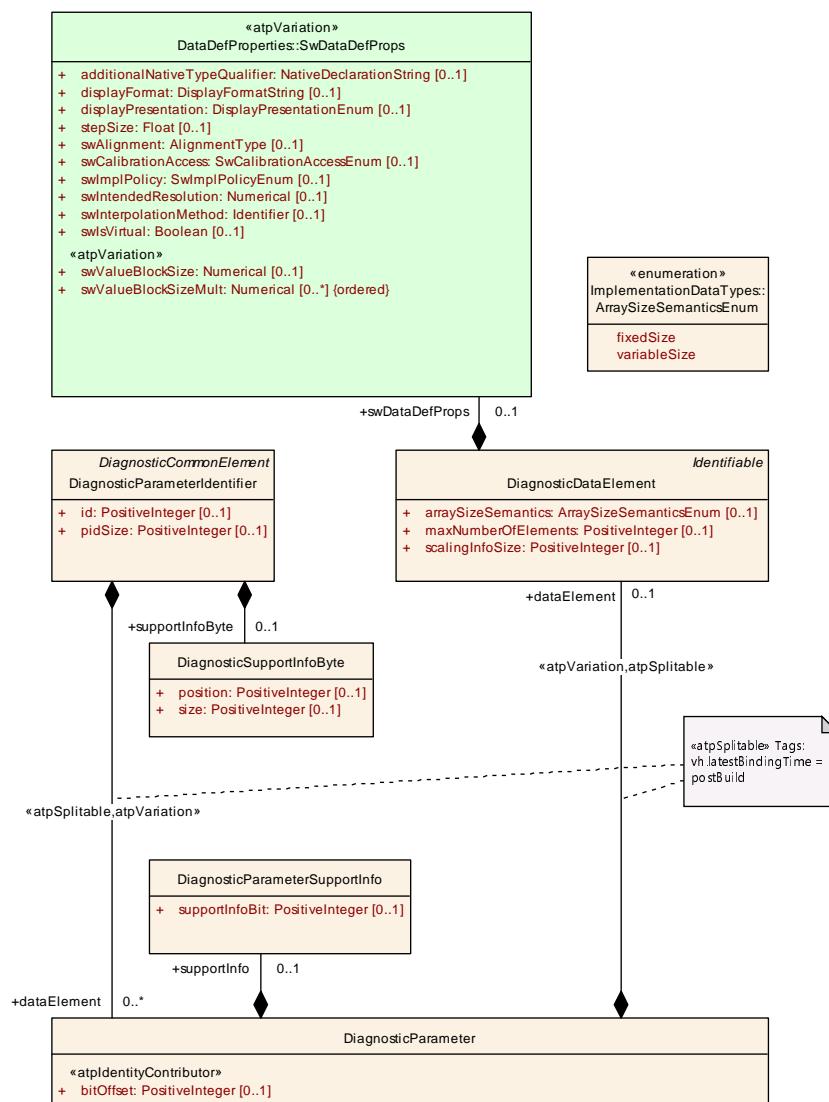


Figure 5.30: Modeling of the DiagnosticParameterIdentifier

[constr_1449] PID shall only carry a fixed-length collection of data [The value of DiagnosticParameterIdentifier.dataElement.dataElement.arraySizeSemantics shall not be set to variableSize.]()

[constr_1750] Existence of attribute `DiagnosticParameterIdentifier.pidSize` [Attribute `DiagnosticParameterIdentifier.pidSize` is only relevant if a gap exists at the end of the `DiagnosticParameterIdentifier`. If this gap does not exist, the size of the `DiagnosticParameterIdentifier` can be computed.]()

Class	<code>DiagnosticParameterIdentifier</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to model a diagnostic parameter identifier (PID) for the purpose of executing on-board diagnostics (OBD). Tags: atp.recommendedPackage=DiagnosticParameterIdentifiers			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferable</code> , <code>PackageableElement</code> , <code>Referable</code>			
Attribute	Type	Mult.	Kind	Note
dataElement	<code>DiagnosticParameter</code>	*	aggr	This represents the data carried by the Diagnostic ParameterIdentifier. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=dataElement.bitOffset, dataElement.variation Point.shortLabel vh.latestBindingTime=postBuild
id	<code>PositiveInteger</code>	0..1	attr	This is the numerical identifier used to identify the DiagnosticParameterIdentifier in the scope of diagnostic workflow (see SAE J1979-DA).
pidSize	<code>PositiveInteger</code>	0..1	attr	The size of the entire PID can be greater than the sum of the data elements because padding might be applied. Unit: byte.
supportInfoByte	<code>DiagnosticSupportInfoByte</code>	0..1	aggr	This represents the supported information associated with the DiagnosticParameterIdentifier.

Table 5.95: DiagnosticParameterIdentifier

[constr_1819] Existence of attribute `DiagnosticParameterIdentifier.id` [For each `DiagnosticParameterIdentifier`, attribute `id` shall exist **at the time when the derivation to Ecuc starts.**]()

Class	<code>DiagnosticParameterSupportInfo</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This represents a way to define which bit of the supportInfo is representing this part of the PID			
Base	<code>ARObject</code>			
Attribute	Type	Mult.	Kind	Note
supportInfoBit	<code>PositiveInteger</code>	0..1	attr	defines the bit in the SupportInfo byte, which represents the PID DataElement pidSize / position / size. Unit: byte.

Table 5.96: DiagnosticParameterSupportInfo

Class	DiagnosticSupportInfoByte			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class defines the support information (typically byte A) to declare the usability of the Data Elements within the so-called packeted PIDs (e.g. PID\$68).			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
position	PositiveInteger	0..1	attr	This represents the position of the supportInfo in the PID. Unit: byte.
size	PositiveInteger	0..1	attr	This represents the size of the supportInfo within the PID. Unit: byte.

Table 5.97: DiagnosticSupportInfoByte

5.6.1 OBD Mode 0x01 (RequestCurrentPowertrainDiagnosticData)

The service RequestCurrentPowertrainDiagnosticData is modeled in Figure 5.31.

[TPS_DEXT_01125] Support for diagnostic service RequestCurrentPowertrainDiagnosticData [The modeling support for the OBD diagnostic service RequestCurrentPowertrainDiagnosticData utilizes the new meta-class DiagnosticParameterIdentifier such that the meta-class DiagnosticRequestCurrentPowertrainData maintains a reference to DiagnosticParameterIdentifier in the role pid.] ([RS_DEXT_00069](#))

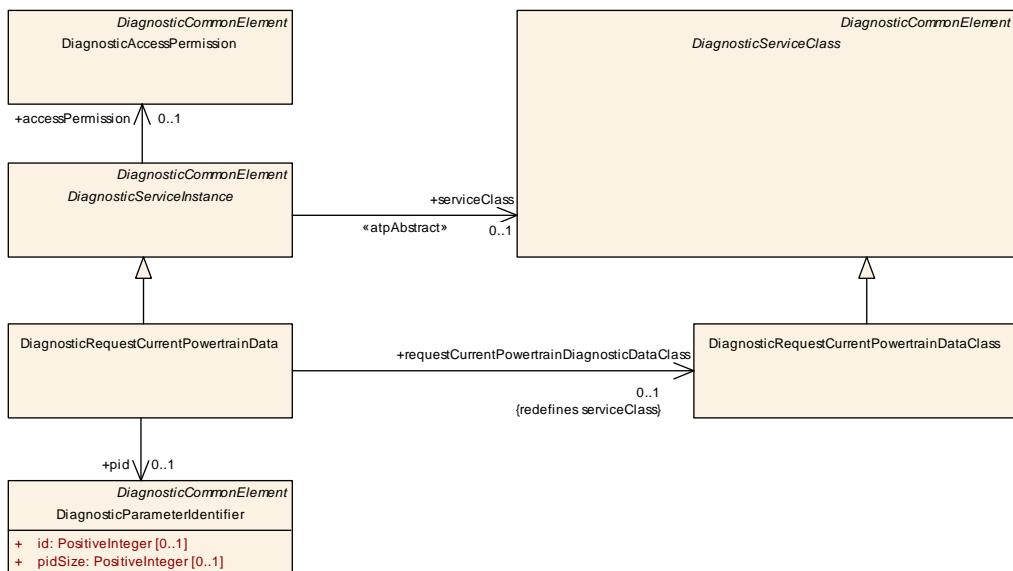


Figure 5.31: Modeling of diagnostic service for OBD Mode 0x01

Class	DiagnosticRequestCurrentPowertrainData			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x01_RequestCurrentPowertrainDiagnosticData			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x01 service. Tags: atp.recommendedPackage=DiagnosticRequestCurrentPowertrainDatas			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
pid	DiagnosticParameterIdentifier	0..1	ref	This represents the PID associated with this instance of the OBD mode 0x01 service.
requestCurrentPowertrainDiagnosticData Class	DiagnosticRequestCurrentPowertrainData Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestCurrentPowertrainData in the given context.</p>

Table 5.98: DiagnosticRequestCurrentPowertrainData

[constr_1820] Existence of reference *DiagnosticRequestCurrentPowertrainData.pid* [For each *DiagnosticRequestCurrentPowertrainData*, the reference to *DiagnosticParameterIdentifier* in the role *pid* shall exist at the time when the derivation to Ecuc starts.]()

Class	DiagnosticRequestCurrentPowertrainDataClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x01_RequestCurrentPowertrainDiagnosticData			
Note	This meta-class represents the ability to define common properties for all instances of the "Request current Powertrain Data" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestCurrentPowertrainDatas			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.99: DiagnosticRequestCurrentPowertrainDataClass

5.6.2 OBD Mode 0x02 (RequestPowertrainFreezeFrameData)

The service RequestPowertrainFreezeFrameData is modeled in Figure 5.32.

[TPS_DEXT_01126] Support of OBD service RequestPowertrainFreezeFrameData [The modeling support for the ODB diagnostic service RequestPowertrainFreezeFrameData utilizes the new meta-class *DiagnosticParameterIdentifier* such that the meta-class *DiagnosticRequestCurrentPowertrainData* maintains a reference to *DiagnosticParameterIdentifier* in the role *pid*.] (*RS_DEXT_00070*)

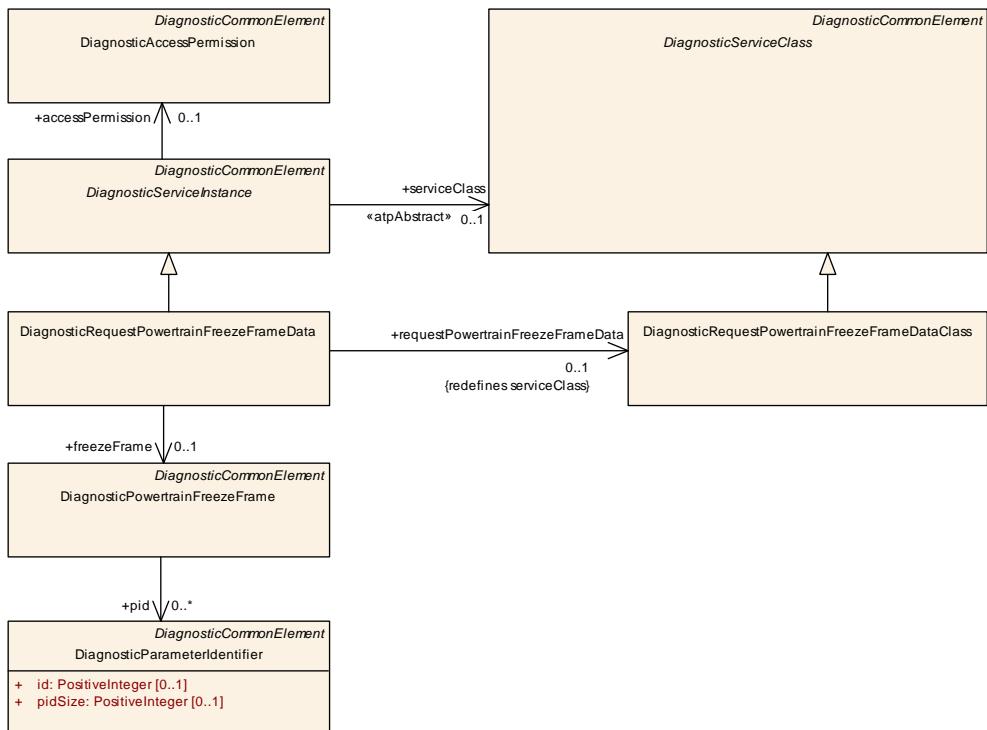


Figure 5.32: Modeling of diagnostic service for OBD Mode 0x02

Class	DiagnosticRequestPowertrainFreezeFrameData			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x02 service. Tags: atp.recommendedPackage=DiagnosticPowertrainFreezeFrames			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticServiceInstance , Identifiable , MultilanguageReferrable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
freezeFrame	DiagnosticPowertrainFreezeFrame	0..1	ref	This represents the associated freeze-frame.
request Powertrain FreezeFrame Data	DiagnosticRequestPowertrainFreezeFrameDataClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestPowertrainFreezeFrameData in the given context.

Table 5.100: DiagnosticRequestPowertrainFreezeFrameData

[constr_1821] Existence of reference [DiagnosticRequestPowertrainFreezeFrameData.freezeFrame](#) 「For each [DiagnosticRequestPowertrainFreezeFrameData](#), the reference to [DiagnosticParameterIdentifier](#) in the role [freezeFrame](#) shall exist at the time when the derivation to Ecuc starts.」()

Class	DiagnosticRequestPowertrainFreezeFrameDataClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData			
Note	This meta-class represents the ability to define common properties for all instances of the "Request Powertrain Freeze Frame Data" OBD diagnostic service.			
	Tags: atp.recommendedPackage=DiagnosticPowertrainFreezeFrames			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.101: DiagnosticRequestPowertrainFreezeFrameDataClass

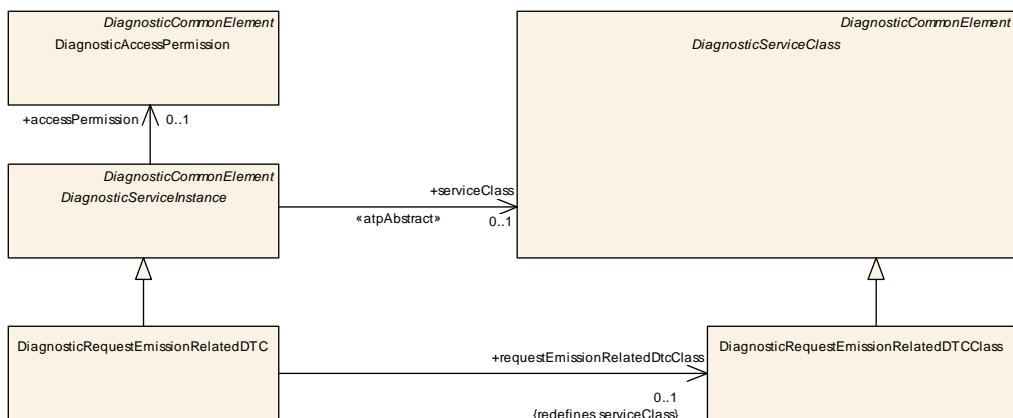
Class	DiagnosticPowertrainFreezeFrame			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData			
Note	This meta-class represents a powertrain-related freeze-frame. In theory, this meta-class would need an additional id attribute. However, legal regulations requires only a single value for this attribute anyway.			
	Tags: atp.recommendedPackage=DiagnosticPowertrainFreezeFrames			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
pid	DiagnosticParameter Identifier	*	ref	This represents the PID associated with this instance of the OBD mode 0x02 service.

Table 5.102: DiagnosticPowertrainFreezeFrame

5.6.3 OBD Mode 0x03 / 0x07 (RequestEmissionRelatedDiagnosticTroubleCodes)

[TPS_DEXT_01127] Semantics of meta-class **DiagnosticRequestEmissionRelatedDTC** [Two very similar OBD services, subsumed as RequestEmissionRelatedDiagnosticTroubleCodes are supported by means of the meta-class DiagnosticRequestEmissionRelatedDTC.] (RS_DEXT_00071)

The modeling is sketched in Figure 5.33.


Figure 5.33: Modeling of diagnostic service for OBD Modes 0x03, 0x07

Class	DiagnosticRequestEmissionRelatedDTC			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x03_0x07_RequestEmissionRelatedDTC			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x03/0x07 service. Tags: atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCs			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referable</i>			
Attribute	Type	Mult.	Kind	Note
request Emission RelatedDtc Class	DiagnosticRequest EmissionRelatedDTC Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestEmission RelatedDTC in the given context.</p>

Table 5.103: DiagnosticRequestEmissionRelatedDTC

Class	DiagnosticRequestEmissionRelatedDTCClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x03_0x07_RequestEmissionRelatedDTC			
Note	This meta-class represents the ability to define common properties for all instances of the "Request Emission Related DTC" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCs			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.104: DiagnosticRequestEmissionRelatedDTCCClass

5.6.4 OBD Mode 0x04 (ClearResetEmissionRelatedDiagnosticInformation)

[TPS_DEXT_01128] Semantics of meta-class *DiagnosticClearResetEmissionRelatedInfo* [The OBD diagnostic service ClearResetEmissionRelatedDiagnosticInformation is supported by means of the meta-class *DiagnosticClearResetEmissionRelatedInfo*.] (RS_DEXT_00072)


Figure 5.34: Modeling of diagnostic service for OBD Mode 0x04

The modeling is sketched in Figure 5.34.

Class	DiagnosticClearResetEmissionRelatedInfo			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x04_ClearResetEmissionRelatedInfo			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x04 service. Tags: atp.recommendedPackage=DiagnosticClearResetEmissionRelatedInfos			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
clearReset Emission Related DiagnosticInfo Class	DiagnosticClearReset EmissionRelatedInfo Class	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticClearResetEmissionRelatedInfo in the given context.</p>

Table 5.105: DiagnosticClearResetEmissionRelatedInfo

Class	DiagnosticClearResetEmissionRelatedInfoClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x04_ClearResetEmissionRelatedInfo			
Note	This meta-class represents the ability to define common properties for all instances of the "Clear Reset Emission Related Data" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticClearResetEmissionRelatedInfos			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.106: DiagnosticClearResetEmissionRelatedInfoClass

5.6.5 OBD Mode 0x06 (RequestOnBoardMonitoringTestResults)

[TPS_DEXT_01129] Support for OBD diagnostic service RequestOnBoardMonitoringTestResults [The OBD diagnostic service RequestOnBoardMonitoringTestResults is supported by means of meta-class **DiagnosticRequestOnBoardMonitoringTestResults** that refers to the representation of the test result modeled as meta-class **DiagnosticTestResult**] (**RS_DEXT_00073**)

The modeling is sketched in Figure 5.35.

In general, the mode 0x06 supports the querying of supported test identifiers from a given server. However, this functionality is not supported in AUTOSAR, hence the existence of [\[constr_1462\]](#).

[constr_1462] Restrictions for the value of **DiagnosticTestResult.testIdentifier.id** [The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of **DiagnosticTestResult.testIdentifier.id**.]



Figure 5.35: Modeling of diagnostic service for OBD Mode 0x06

[TPS_DEXT_01141] Definition of a collection of test results [It is possible to assign a collection of test results to the mode 0x06.

For this purpose, `DiagnosticRequestOnBoardMonitoringTestResults` shall refer to multiple `DiagnosticTestResults` in the role `diagnosticTestResult` that in turn refers to the identical `DiagnosticMeasurementIdentifier` in the role `monitoredIdentifier` (taken as the identification of related test results in downstream processing of a diagnostic extract).] ([\(RS_DEXT_00073\)](#))

Class	<code>DiagnosticRequestOnBoardMonitoringTestResults</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x06_RequestOnBoardMonitoringTestResults			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x06 service. Tags:atp.recommendedPackage=DiagnosticRequestOnBoardMonitoringTestResults			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticServiceInstance</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
diagnosticTestResult	<code>DiagnosticTestResult</code>	*	ref	This reference identifies the applicable collection of test identifiers for setting up a request message for mode 0x06.
requestOnBoardMonitoringTestResultsClass	<code>DiagnosticRequestOnBoardMonitoringTestResultsClass</code>	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticRequestOnBoardMonitoringTestResults</code> in the given context.

Table 5.107: DiagnosticRequestOnBoardMonitoringTestResults

Class	DiagnosticRequestOnBoardMonitoringTestResultsClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x06_RequestOnBoardMonitoringTestResults			
Note	This meta-class represents the ability to define common properties for all instances of the "Request On-Board Monitoring Test Results" OBD diagnostic service.			
	Tags: atp.recommendedPackage=DiagnosticRequestOnBoardMonitoringTestResultss			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.108: DiagnosticRequestOnBoardMonitoringTestResultsClass

5.6.6 OBD Mode 0x08 (RequestControlOfOnBoardDevice)

[TPS_DEXT_01130] Support of OBD diagnostic service RequestControlOfOnBoardDevice [The OBD diagnostic service RequestControlOfOnBoardDevice is supported by means of meta-class **DiagnosticRequestControlOfOnBoardDevice** that in turn refers to a **DiagnosticTestRoutineIdentifier** in the role **testId**] (*RS_DEXT_00074*)

The modeling is sketched in Figure 5.36.

In general, the mode 0x06 supports the querying of supported test routine identifiers from a given server. However, this functionality is not supported in AUTOSAR, hence the existence of [[constr_1461](#)].

[constr_1461] Restrictions for the value of **DiagnosticTestRoutineIdentifier.id** [The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of **DiagnosticTestRoutineIdentifier.id**.]

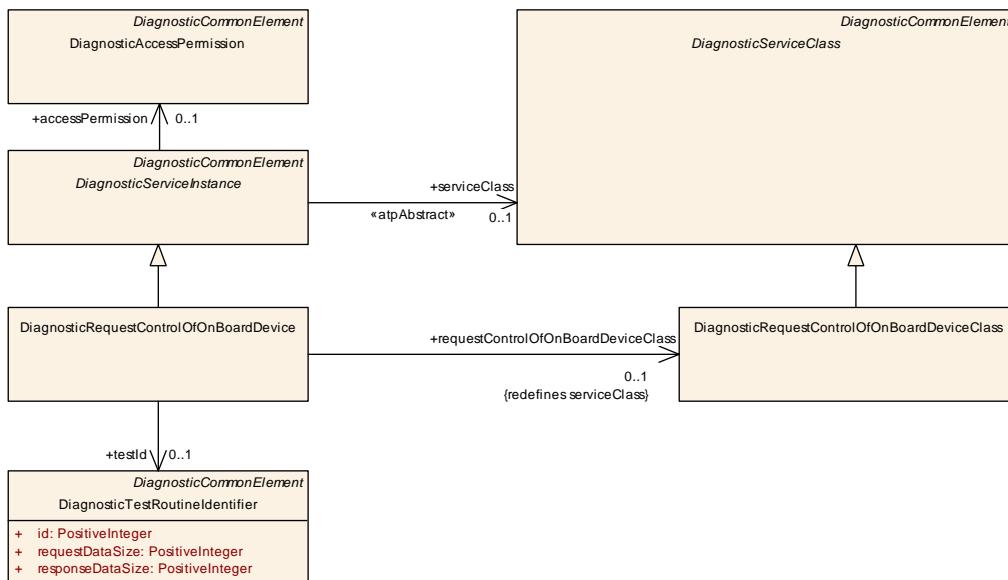


Figure 5.36: Modeling of diagnostic service for OBD Mode 0x08

Class	DiagnosticRequestControlOfOnBoardDevice			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x08 service. Tags: atp.recommendedPackage=DiagnosticRequestControlOfOnBoardDevices			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
requestControlOfOnBoardDeviceClass	DiagnosticRequestControlOfOnBoardDeviceClass	0..1	ref	This reference substantiates that abstract reference in the role serviceClass for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestControlOfOnBoardDevice in the given context.
testId	DiagnosticTestRoutineIdentifier	0..1	ref	This represents the test Id for the mode 0x08.

Table 5.109: DiagnosticRequestControlOfOnBoardDevice

[constr_1822] Existence of reference `DiagnosticRequestControlOfOnBoardDevice.testId` [For each `DiagnosticRequestControlOfOnBoardDevice`, the reference to `DiagnosticParameterIdentifier` in the role `testId` shall exist at the time when the derivation to Ecuc starts.]()

Class	DiagnosticRequestControlOfOnBoardDeviceClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice			
Note	This meta-class represents the ability to define common properties for all instances of the "Request Control Of On-Board Device" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestControlOfOnBoardDevices			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.110: DiagnosticRequestControlOfOnBoardDeviceClass

Class	DiagnosticTestRoutineIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice			
Note	This represents the test id of the DiagnosticTestIdentifier. Tags: atp.recommendedPackage=DiagnosticTestRoutineIdentifier			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	1	attr	This represents the numerical id of the DiagnosticTestIdentifier (see SAE J1979-DA).
requestDataSize	PositiveInteger	1	attr	This represents the specified data size for the request message. Unit: byte.



Class	DiagnosticTestRoutineIdentifier		
responseDataSize	PositiveInteger	1	attr This represents the specified data size for the response message. Unit:byte.

Table 5.111: DiagnosticTestRoutineIdentifier

[constr_1823] Existence of attribute `DiagnosticTestRoutineIdentifier.id` [For each `DiagnosticTestRoutineIdentifier`, attribute `id` shall exist at the time when the derivation to Ecuc starts.]()

[constr_1824] Existence of attribute `DiagnosticTestRoutineIdentifier.requestDataSize` [For each `DiagnosticTestRoutineIdentifier`, attribute `requestDataSize` shall exist at the time when the derivation to Ecuc starts.]()

[constr_1825] Existence of attribute `DiagnosticTestRoutineIdentifier.responseDataSize` [For each `DiagnosticTestRoutineIdentifier`, attribute `responseDataSize` shall exist at the time when the derivation to Ecuc starts.]()

5.6.7 OBD Mode 0x09 (RequestVehicleInformation)

[TPS_DEXT_01131] Support for OBD diagnostic service RequestVehicleInformation [The OBD diagnostic service `RequestVehicleInformation` is supported by means of meta-class `DiagnosticRequestVehicleInfo` that in turn references a `DiagnosticInfoType` in the role `infoType`.] ([RS_DEXT_00075](#))

The modeling is sketched in Figure 5.37.

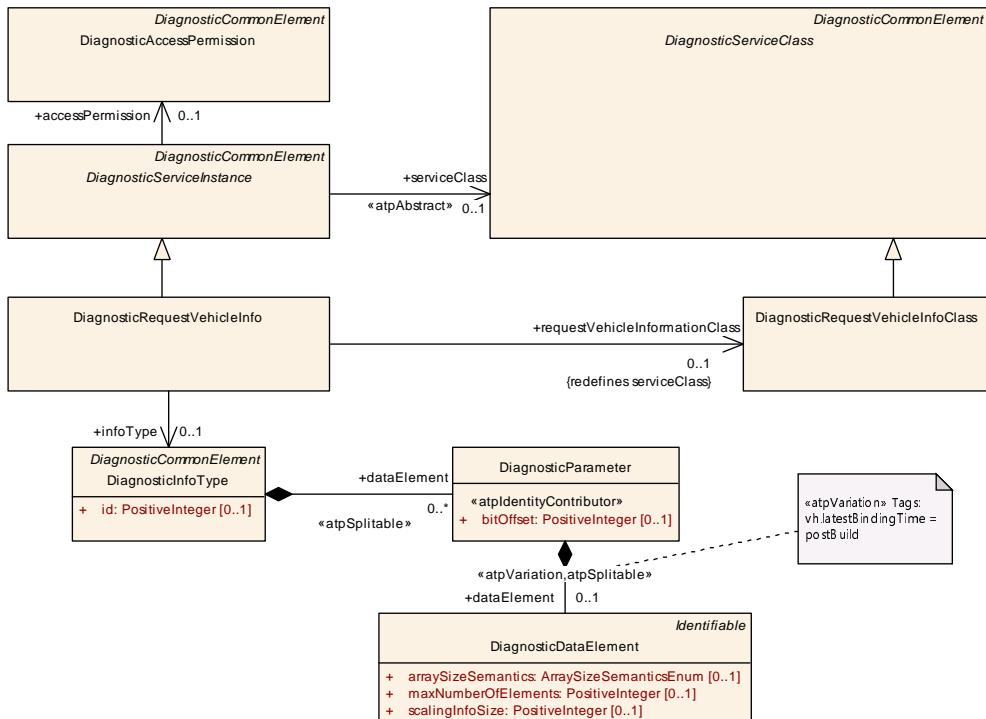
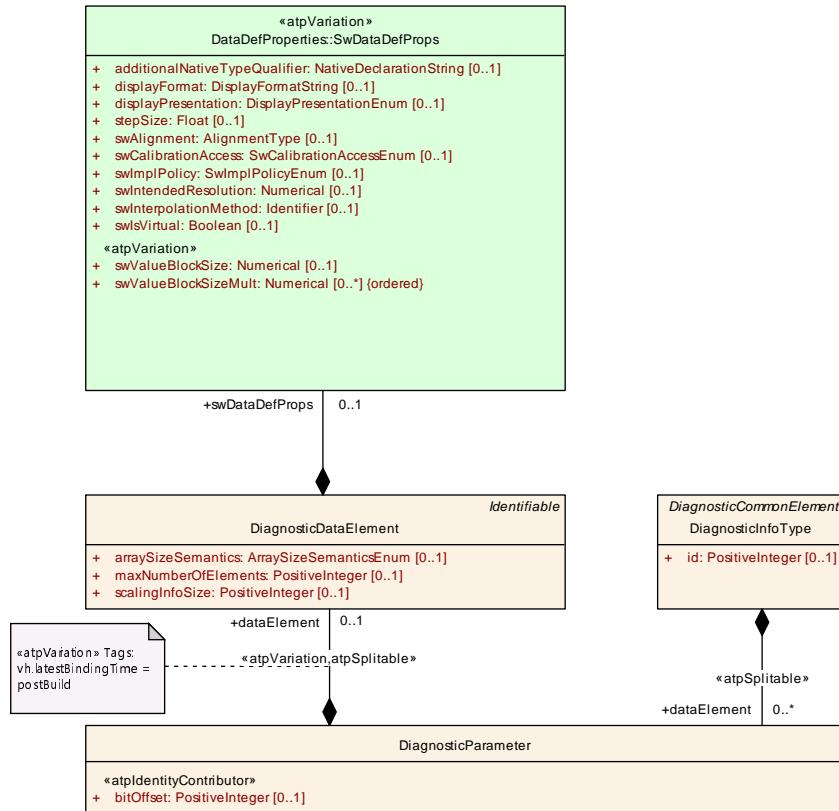


Figure 5.37: Modeling of diagnostic service for OBD Mode 0x09


Figure 5.38: Modeling of `DiagnosticInfoType`

[constr_1460] Restrictions for the value of `DiagnosticInfoType.id` [The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, and 0xE0 are not allowed to appear in the value of `DiagnosticInfoType.id`.]()

[constr_1749] Existence of `DiagnosticInfoType.dataElement` [For each `DiagnosticInfoType`, at least one aggregation of `DiagnosticParameter` in the role `dataElement` shall exist at the time when the DEXT is complete.]()

Class	DiagnosticRequestVehicleInfo			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x09_RequestVehicleInformation			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x09 service. Tags:atp.recommendedPackage=DiagnosticRequestVehicleInfos			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
infoType	<code>DiagnosticInfoType</code>	0..1	ref	This represents the info type associated with the mode 0x09 service.
requestVehicle Information Class	<code>DiagnosticRequest VehicleInfoClass</code>	0..1	ref	This reference substantiates that abstract reference in the role <code>serviceClass</code> for this specific concrete class. Thereby, the reference represents the ability to access shared attributes among all <code>DiagnosticRequestVehicleInfo</code> in the given context.

Table 5.112: DiagnosticRequestVehicleInfo

[constr_1826] Existence of reference `DiagnosticRequestVehicleInfo.infoType` [For each `DiagnosticRequestVehicleInfo`, the reference to `DiagnosticParameterIdentifier` in the role `infoType` shall exist **at the time when the derivation to Ecuc starts.**]()

Class	<code>DiagnosticRequestVehicleInfoClass</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x09_RequestVehicleInformation			
Note	This meta-class represents the ability to define common properties for all instances of the "Request Vehicle Info" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestVehicleInfos			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticServiceClass</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.113: `DiagnosticRequestVehicleInfoClass`

Class	<code>DiagnosticInfoType</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::CommonDiagnostics			
Note	This meta-class represents the ability to model an OBD info type. Tags: atp.recommendedPackage=DiagnosticInfoTypes			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
dataElement	<code>DiagnosticParameter</code>	*	aggr	This represents the data associated with the enclosing <code>DiagnosticInfoType</code> . Stereotypes: atpSplittable Tags: atp.Splitkey=dataElement.bitOffset, dataElement.variationPoint.shortLabel
id	<code>PositiveInteger</code>	0..1	attr	This attribute represents the value of InfoType (see SAE J1979-DA).

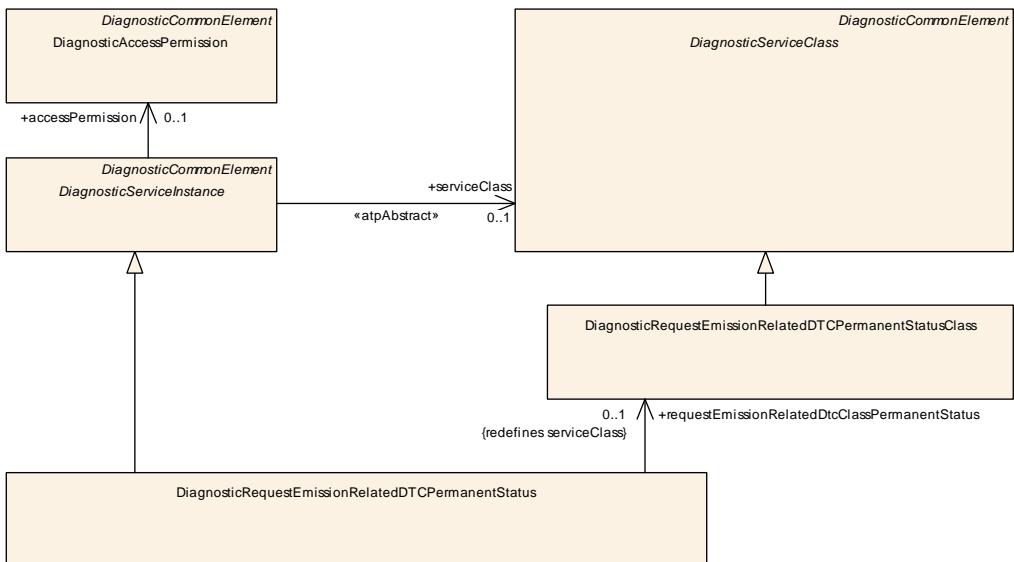
Table 5.114: `DiagnosticInfoType`

[constr_1827] Existence of attribute `DiagnosticInfoType.id` [For each `DiagnosticInfoType`, attribute `id` shall exist **at the time when the derivation to Ecuc starts.**]()

5.6.8 OBD Mode 0x0A (RequestEmissionRelatedDiagnosticTroubleCodesPermanentStatus)

[TPS_DEXT_01132] Support for OBD diagnostic service RequestEmissionRelatedDiagnosticTroubleCodesPermanentStatus [The OBD diagnostic service `RequestEmissionRelatedDiagnosticTroubleCodesPermanentStatus` is supported by means of meta-class `DiagnosticRequestEmissionRelatedDTCPermanentStatus`.] ([RS_DEXT_00076](#))

The modeling is sketched in Figure 5.39.


Figure 5.39: Modeling of diagnostic service for OBD Modes 0x0A

Class	DiagnosticRequestEmissionRelatedDTCPermanentStatus			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x0A_RequestEmissionRelatedDTCPermanentStatus			
Note	This meta-class represents the ability to model an instance of the OBD mode 0x0A service. Tags: atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCPermanentStatus			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceInstance, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
request Emission RelatedDtc Class Permanent Status	DiagnosticRequest EmissionRelatedDTC PermanentStatusClass	0..1	ref	<p>This reference substantiates that abstract reference in the role serviceClass for this specific concrete class.</p> <p>Thereby, the reference represents the ability to access shared attributes among all DiagnosticRequestEmission RelatedDTCPermanentStatus in the given context.</p>

Table 5.115: DiagnosticRequestEmissionRelatedDTCPermanentStatus

Class	DiagnosticRequestEmissionRelatedDTCPermanentStatusClass			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dcm::ObdService::Mode_0x0A_RequestEmissionRelatedDTCPermanentStatus			
Note	This meta-class represents the ability to define common properties for all instances of the "Request Emission Related DTC Permanent Status" OBD diagnostic service. Tags: atp.recommendedPackage=DiagnosticRequestEmissionRelatedDTCPermanentStatus			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticServiceClass, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.116: DiagnosticRequestEmissionRelatedDTCPermanentStatusClass

5.7 UDS Diagnostic Services for supporting WWH-OBD

[TPS_DEXT_01133] Support for WWH-OBD within the diagnostic extract [A support for WWH-OBD [19] within the diagnostic extract involves the usage of the following UDS services and their respective subfunctions:

DiagnosticReadDataByIdentifier (0x22) where the value of attribute `DiagnosticDataIdentifier.id` inside the interval defined by the OBD range, i.e.:

- F400-F4FF
- F600-F6FF
- F800-F8FF

Please note that the usage of this diagnostic service in an implementation of WWH-OBD corresponds to the existence of a `DiagnosticValueNeeds` on the side of an `AtomicSwComponentType` that interacts with the diagnostic service.

DiagnosticRoutineControl (0x31) where the value of attribute `DiagnosticRoutine.id` is inside the interval defined by the OBD range, i.e. E000-E0FF.

Please note that the usage of this diagnostic service in an implementation of WWH-OBD corresponds to the existence of a `DiagnosticRoutineNeeds` on the side of an `AtomicSwComponentType` that implements routines executed within the diagnostic service.

DiagnosticClearDiagnosticInformation (0x14)

DiagnosticReadDTCInformation (0x19) with the subfunctions (0x4, 0x6, 0x42)

](*RS_DEXT_00077*)

When used in a WWH-OBD environment, meta-class `DiagnosticRoutine` utilizes the attribute `routineInfo` to support the configuration of the diagnostic response. In a pure UDS environment (except in an application of ISO 26021 [17]) the attribute has no semantics.

5.8 Diagnostic Service Mapping

Automotive diagnostics interacts with both application software and basic software in various ways that can be formalized using the AUTOSAR meta-model. This chapter contains a description of the formalization of this interaction along with the applicable constraints.

[TPS_DEXT_01040] Use case where the `DiagnosticExtract` refers to software-components [This is a list of the potential use case where the `DiagnosticExtract` refers to software-components in general and `PortPrototypes` in the context of either `CompositionSwComponentTypes` or `AtomicSwComponentTypes`:

- **DiagnosticExtract** refers to **PortPrototype** (for the access to **dataElement**) or **SwcServiceDependency** in the context of a **AtomicSwComponentType** embedded in the hierarchy created by the **rootSoftwareComposition**.
- **DiagnosticExtract** refers to a **PortPrototype** (for the access to **dataElement**) or **SwcServiceDependency** in the context of a **AtomicSwComponentType** embedded in the hierarchy created by a **CompositionSwComponentType** that is nowhere aggregated (for the time being).
- **DiagnosticExtract** refers to a **PortPrototype** (for the access to **dataElement**) or **SwcServiceDependency** in the context of an **AtomicSwComponentType**.
- **DiagnosticExtract** refers to a **BswServiceDependency**.

」(*RS_DEXT_00052*)

Class	SwcServiceDependency			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwcInternalBehavior::ServiceMapping			
Note	Specialization of ServiceDependency in the context of an SwcInternalBehavior. It allows to associate ports, port groups and (in special cases) data defined for an atomic software component to a given ServiceNeeds element.			
Base	<i>ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable, ServiceDependency</i>			
Attribute	Type	Mult.	Kind	Note
assignedData	RoleBasedData Assignment	*	aggr	<p>Defines the role of an associated data object of the same component.</p> <p>Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime</p>
assignedPort	RoleBasedPort Assignment	*	aggr	<p>Defines the role of an associated port of the same component.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=assignedPort, assignedPort.variation Point.shortLabel vh.latestBindingTime=preCompileTime</p>
representedPort Group	PortGroup	0..1	ref	This reference specifies an association between the ServiceNeeds and a PortGroup, for example to request a communication mode which applies for communication via these ports. The referred PortGroup shall be local to this atomic SWC, but via the links between the Port Groups, a tool can evaluate this information such that all the ports linked via this port group on the same ECU can be found.
serviceNeeds	ServiceNeeds	0..1	aggr	The associated ServiceNeeds.

Table 5.117: SwcServiceDependency

Class	BswServiceDependency			
Package	M2::AUTOSARTemplates::BswModuleTemplate::BswBehavior			
Note	Specialization of ServiceDependency in the context of an BswInternalBehavior. It allows to associate BswModuleEntries and data defined for a BSW module or cluster to a given ServiceNeeds element.			
Base	ARObject, ServiceDependency			
Attribute	Type	Mult.	Kind	Note
assignedData	RoleBasedDataAssignment	*	aggr	Defines the role of an associated data object (owned by this module or cluster) in the context of the ServiceNeeds element. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
assignedEntryRole	RoleBasedBswModuleEntryAssignment	*	aggr	Defines the role of an associated BswModuleEntry in the context of the ServiceNeeds element. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=assignedEntryRole, assignedEntryRole.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
ident	BswServiceDependencyIdent	0..1	aggr	This adds the ability to become referable to BswService Dependency. Stereotypes: atpIdentityContributor Tags: atp.Status=shallBecomeMandatory xml.sequenceOffset=-100
serviceNeeds	ServiceNeeds	1	aggr	The associated ServiceNeeds.

Table 5.118: BswServiceDependency

[constr_1450] Service mapping for ODB mode 0x01 for **DiagnosticParameterIdentifier** [if a **DiagnosticServiceSwMapping** or **DiagnosticServiceDataMapping** refers to a **DiagnosticRequestCurrentPowertrainData** and a **DiagnosticDataElement** that is aggregated by a **DiagnosticParameterIdentifier** then one of two alternative model configurations shall exist:

- **SwcServiceDependency** referenced by the same **DiagnosticServiceSwMapping** or **DiagnosticServiceDataMapping** shall aggregate an **ObdPidServiceNeeds** in the role **serviceNeeds**.
- The **BswServiceDependencyIdent** referenced by the same **DiagnosticServiceSwMapping** shall aggregate an **ObdPidServiceNeeds** in the role **serviceNeeds**.

]()

[constr_1451] Service mapping for OBD mode 0x09 for **DiagnosticInfoType** [if a **DiagnosticServiceSwMapping** refers to **DiagnosticRequestVehicleInfo** and a **DiagnosticDataElement** that is aggregated by a **DiagnosticInfoType** then one of two alternative model configurations shall exist:

- The **SwcServiceDependency** referenced by the same **DiagnosticServiceSwMapping** shall aggregate a **ObdInfoServiceNeeds** in the role **serviceNeeds**.

- The `BswServiceDependencyIdent` referenced by the same `DiagnosticServiceSwMapping` shall aggregate an `ObdInfoServiceNeeds` in the role `serviceNeeds`.

]()

[constr_1452] Service mapping for OBD mode 0x08 for `DiagnosticInfoType`
 [if a `DiagnosticServiceSwMapping` refers to a `DiagnosticRequestControlOnBoardDevice` then the `SwcServiceDependency` referenced by the same `DiagnosticServiceSwMapping` shall aggregate an `ObdControlServiceNeeds` in the role `serviceNeeds`.]()

Class	ObdInfoServiceNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a given InfoType (OBD Service 09) which is supported by this component or module.			
Base	<i>ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, Service Needs</i>			
Attribute	Type	Mult.	Kind	Note
dataLength	PositiveInteger	0..1	attr	<p>This attribute is applicable only if the ServiceNeeds is aggregated within <code>BswModuleDependency</code>.</p> <p>This attribute represents the length of data (in bytes) provided for this InfoType.</p>
infoType	PositiveInteger	0..1	attr	The InfoType according to ISO 15031-5

Table 5.119: ObdInfoServiceNeeds

Class	ObdPidServiceNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a particular PID (parameter identifier) which is supported by this component or module. In case of using a client/server communicated value, the related value shall be communicated via the port referenced by <code>asssignedPort</code> . The details of this communication (e.g. appropriate naming conventions) are specified in the related software specifications (SWS).			
Base	<i>ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, Service Needs</i>			
Attribute	Type	Mult.	Kind	Note
dataLength	PositiveInteger	0..1	attr	<p>This attribute is applicable only if the ServiceNeeds is aggregated within <code>BswModuleDependency</code>.</p> <p>This attribute represents the length of data (in bytes) provided for this particular PID signal.</p>
parameterId	PositiveInteger	0..1	attr	Standardized parameter identifier (PID) according to the OBD standard specified in attribute "standard".
standard	String	0..1	attr	Annotates the standard according to which the PID is given, e.g. "ISO15031-5" or "SAE J1979 Rev May 2007".

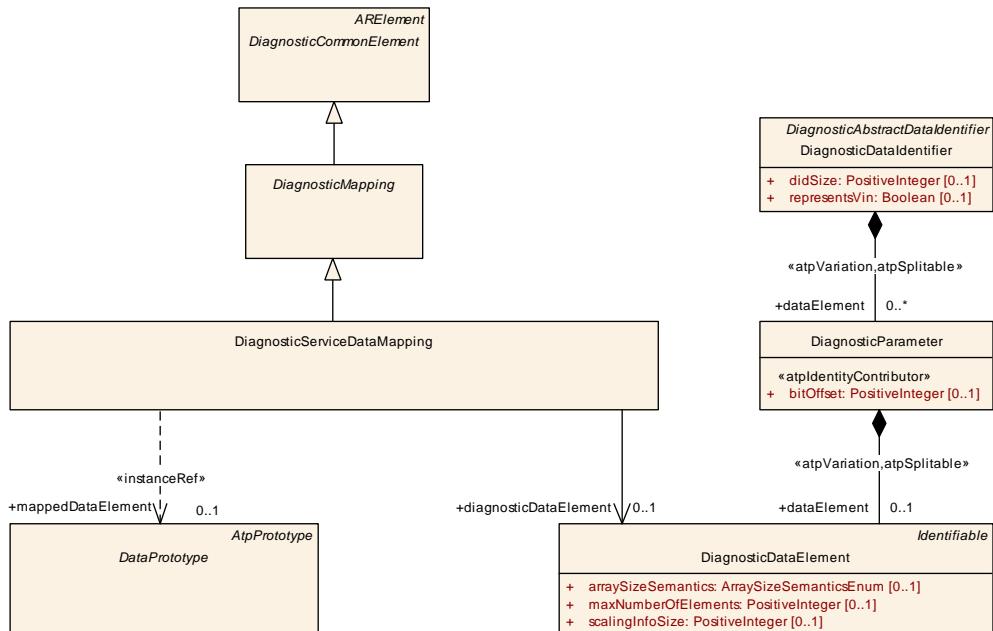
Table 5.120: ObdPidServiceNeeds

Class	ObdControlServiceNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs of a component or module on the configuration of OBD Service 08 (request control of on-board system) in relation to a particular test-Identifier (TID) supported by this component or module.			
Base	ARObject, DiagnosticCapabilityElement, Identifiable, MultilanguageReferrable, Referrable, Service Needs			
Attribute	Type	Mult.	Kind	Note
testId	PositiveInteger	0..1	attr	Test Identifier (TID) according to ISO 15031-5.

Table 5.121: ObdControlServiceNeeds

5.8.1 Diagnostic Service Data Mapping

Please note that the Dcm is in general entitled to both read and write a [dataElement](#). This applies even if the corresponding [PortPrototype](#) is a [PPortPrototype](#). This means that the diagnostic service data mapping is limited to [SenderReceiverInterface](#).


Figure 5.40: Dcm service data mapping

If several [DiagnosticServiceDataMapping](#)s exist that refer to the context of the same [VariableDataPrototype](#) and different [DiagnosticDataElement](#)s aggregated by the same [DiagnosticDataIdentifier](#) then this is a strong indication that an atomic access to a structured data type is intended.

The association of elements of the data structure to [DiagnosticDataElement](#)s is implicitly given by means of matching [shortName](#) or by explicit references into the internals of the [VariableDataPrototype](#).

Please note that this approach of associating elements of a composite data structure to **DiagnosticDataElements** of one **DiagnosticDataIdentifier** based on the **shortName** can only work if the depth of the composite data structure is limited to 1.

[TPS_DEXT_01041] Semantics of attribute **DiagnosticServiceDataMapping.diagnosticDataElement** [By means of the attribute **DiagnosticServiceDataMapping.diagnosticDataElement** it is possible to specify that the Dcm has access to

- a **dataElement** in a **PortPrototype** typed by a **SenderReceiverInterface** or
- an **nvData** in a **PortPrototype** typed by an **NvDataInterface**.

This type of data access is suitable for the diagnostic services **ReadDataByIdentifier** (0x22), **WriteDataByIdentifier** (0x2E), and **InputOutputControl** (0x2F).] (**RS_DEXT_00052**)

Class	DiagnosticServiceDataMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping			
Note	This represents the ability to define a mapping of a diagnostic service to a software-component. This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in ServiceInterfaces on the adaptive platform. Tags: atp.recommendedPackage=DiagnosticServiceMappings			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticMapping</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticDataElement	DiagnosticDataElement	0..1	ref	This represents the applicable payload that corresponds to the referenced DataPrototype in the role mappedDataElement or (in case of a usage on the adaptive platform) mappedApDataElement.
mappedDataElement	DataPrototype	0..1	iref	This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform. InstanceRef implemented by: DataPrototypeInSystem InstanceRef

Table 5.122: DiagnosticServiceDataMapping

[constr_1828] Existence of referenced from **DiagnosticServiceDataMapping** [For each **DiagnosticServiceDataMapping**, the following references shall exist at the time when the DEXT is complete:

- Reference to **DiagnosticDataElement** in the role **diagnosticDataElement**
- Reference to **DataPrototype** in the role **mappedDataElement**

]()

[constr_1343] Simultaneous existence of the attributes **DiagnosticServiceDataMapping.diagnosticDataElement and **DiagnosticDataByIdentifier**.**

dataIdentifier [A `DiagnosticServiceDataMapping.diagnosticDataElement` shall also be aggregated by a `DiagnosticDataByIdentifier` in the role `dataIdentifier.dataElement.dataElement`.]()

Please note that [constr_1343] shall only apply for the step in the methodology where the `DiagnosticExtract` is considered complete to the point that the configuration of the Dcm and Dem can be derived. Any intermediate step, e.g. hand-over from OEM to tier-1 supplier does not actually enforce [constr_1343].

In other words, [constr_1343] makes sure that there is a connection between the `DiagnosticServiceDataMapping` and the corresponding `DiagnosticReadDataByIdentifier` or `DiagnosticWriteDataByIdentifier`.

Only by this means the diagnostic service becomes fully usable.

[constr_1344] Condition for the identification of data types of attributes `DiagnosticServiceDataMapping.mappedDataElement` [`DiagnosticServiceDataMapping.mappedDataElement` shall be typed by either:

- `ApplicationPrimitiveDataType` where the value of attribute `category` is set to `VALUE`.
- `ApplicationArrayType` where the value of attribute `element.category` is set to `VALUE`.

]()

Rationale: the `DiagnosticServiceDataMapping.mappedDataElement` is mapped to a single `DiagnosticDataElement` that in turn can only be a primitive value or an array of primitive values.

Also, the modeling of the reference `DiagnosticServiceDataMapping.mappedDataElement` only supports the case where the target `DataPrototype` is typed by an `ApplicationDataType`.

Class	ApplicationPrimitiveDataType			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
Note	A primitive data type defines a set of allowed values. Tags: atp.recommendedPackage=ApplicationDataTypes			
Base	<i>ARElement, ARObject, ApplicationDataType, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, AutosarDataType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.123: ApplicationPrimitiveDataType

Class	ImplementationDataType			
Package	M2::AUTOSARTemplates::CommonStructure::ImplementationDataTypes			
Note	Describes a reusable data type on the implementation level. This will typically correspond to a typedef in C-code. Tags:atp.recommendedPackage=ImplementationDataTypes			
Base	<i>ARElement, ARObject, AbstractImplementationDataType, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, AutosarDataType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dynamicArraySizeProfile	String	0..1	attr	Specifies the profile which the array will follow in case this data type is a variable size array.
isStructWithOptionalElement	Boolean	0..1	attr	This attribute is only valid if the attribute category is set to STRUCTURE. If set to True, this attribute indicates that the ImplementationDataType has been created with the intention to define at least one element of the structure as optional.
subElement(ordered)	ImplementationDataTypeElement	*	aggr	Specifies an element of an array, struct, or union data type. The aggregation of ImplementationDataTypeElement is subject to variability with the purpose to support the conditional existence of elements inside a Implementation DataType representing a structure. Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime
symbolProps	SymbolProps	0..1	aggr	This represents the SymbolProps for the Implementation DataType. Stereotypes: atpSplittable Tags:atp.Splitkey=symbolProps.shortName
typeEmitter	NameToken	0..1	attr	This attribute is used to control which part of the AUTOSAR toolchain is supposed to trigger data type definitions.

Table 5.124: ImplementationDataType

In other words, [constr_1344] requires that both `DiagnosticServiceDataMapping.mappedDataElement`⁴ and `DiagnosticServiceDataMapping.diagnosticDataElement` shall be typed by a primitive data type.

Please refer to [8] for a detailed explanation of the meaning of the value of a data type category.

[constr_1345] `DiagnosticDataElement` shall not (finally) be aggregated by a `DiagnosticRoutine` [A `DiagnosticDataElement` that is referenced by a `DiagnosticServiceDataMapping` shall not (finally) be aggregated by a `DiagnosticRoutine`.]()

[TPS_DEXT_01042] Dem uses `DiagnosticServiceDataMapping` [There is a use case for the Dem to utilize a `DiagnosticServiceDataMapping` such that elements of a `DiagnosticExtendedDataRecord` are fetched from `dataElements` in an `ApplicationSwComponentType`.

⁴`DiagnosticServiceDataMapping.mappedDataElement` can be an element of a (potentially large) composite data type. The utility of this is that this way the footprint of the data access to the payload of request and response messages can be kept as low as possible.

Therefore, [constr_1345] does intentionally not exclude the aggregation of [DiagnosticDataElement](#) by [DiagnosticExtendedDataRecord](#) in the context of [DiagnosticServiceDataMapping](#).] (RS_DEXT_00052)

Class	ApplicationSwComponentType			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	The ApplicationSwComponentType is used to represent the application software. Tags: atp.recommendedPackage=SwComponentTypes			
Base	ARElement , ARObject , AtomicSwComponentType , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpType , CollectableElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable , SwComponentType			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.125: ApplicationSwComponentType

[constr_1584] [DiagnosticDataElement](#) shall not be used more than once in **I/O Control instance** [A given [DiagnosticDataElement](#) shall not be used by more than one [DiagnosticServiceDataMapping](#) that in turn refers to a [DataPrototype](#) defined in the context of a [DataInterface](#) that is used to type a [PortPrototype](#) that in turn is referenced by a [RoleBasedPortAssignment](#) where attribute [role](#) is set to the value [IOControlRequest](#).]()

5.8.2 Diagnostic Service Software Mapping

The diagnostic service software mapping is limited to [ClientServerInterface](#) or a direct function call (in the case of basic software or complex driver).

Class	ClientServerInterface			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	A client/server interface declares a number of operations that can be invoked on a server by a client. Tags: atp.recommendedPackage=PortInterfaces			
Base	ARElement , ARObject , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpType , CollectableElement , Identifiable , MultilanguageReferrable , PackageableElement , PortInterface , Referrable			
Attribute	Type	Mult.	Kind	Note
operation	ClientServerOperation	*	aggr	ClientServerOperation(s) of this ClientServerInterface. Stereotypes: atpVariation Tags: vh.latestBindingTime=blueprintDerivationTime
possibleError	ApplicationError	*	aggr	Application errors that are defined as part of this interface.

Table 5.126: ClientServerInterface

The following constraint only applies to the case where I/O Control is implemented via sender-receiver-communication (see [TPS_SWCT_01654])

[TPS_DEXT_01043] **Purpose of DiagnosticServiceSwMapping** [The meta-class [DiagnosticServiceSwMapping](#) has been introduced to support the creation of

a relationship between the definition of a given diagnostic service to the [SwcServiceDependency](#) (if the service applies to the application software) or [BswServiceDependency](#) (if the service applies to the basic software).] ([RS_DEXT_00052](#))

It is required to use the applicable form of reference to the target [SwcServiceDependency](#) depending on the context of the enclosing [AtomicSwComponentType](#).

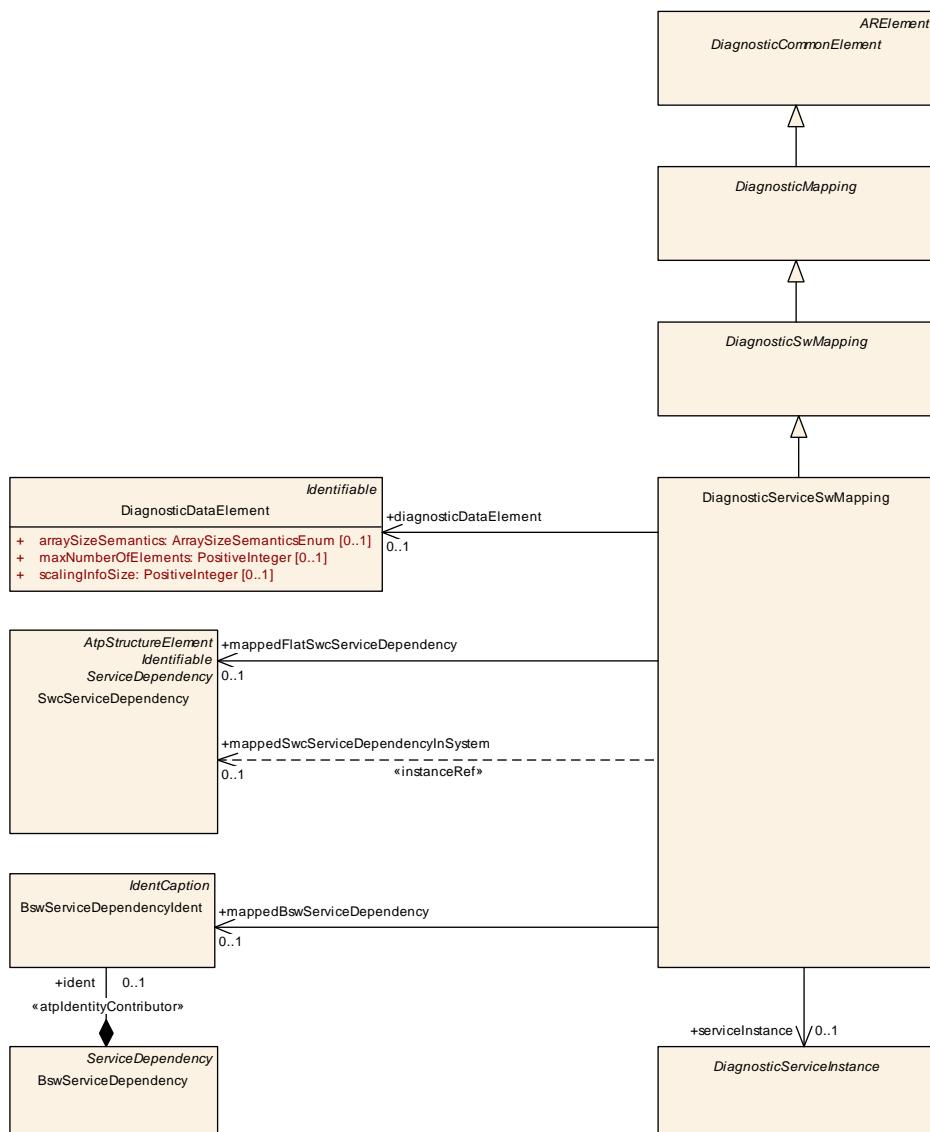


Figure 5.41: Dcm service software mapping

Class	DiagnosticSwMapping (abstract)
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping
Note	This represents the ability to define a mapping between a diagnostic information (at this point there is no way to become more specific about the semantics) to a software-component.





Class	<i>DiagnosticSwMapping</i> (abstract)			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	<i>DiagnosticEnableConditionPortMapping, DiagnosticEventPortMapping, DiagnosticFimFunctionMapping, DiagnosticOperationCyclePortMapping, DiagnosticServiceSwMapping, DiagnosticStorageConditionPort Mapping</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.127: DiagnosticSwMapping

Class	<i>DiagnosticServiceSwMapping</i>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping			
Note	This represents the ability to define a mapping of a diagnostic service to a software-component or a basic-software module. If the former is used then this kind of service mapping is applicable for the usage of ClientServerInterfaces. Tags: atp.recommendedPackage=DiagnosticServiceMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, DiagnosticSwMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticDataElement	<i>DiagnosticDataElement</i>	0..1	ref	This represents a DiagnosticDataElement required to execute the respective diagnostic service in the context of the diagnostic service mapping,
mappedBswServiceDependency	<i>BswServiceDependencyIdent</i>	0..1	ref	This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.
mappedFlatSwcServiceDependency	<i>SwcServiceDependency</i>	0..1	ref	This represents the ability to refer to an AtomicSwComponentType that is available without the definition of how it will be embedded into the component hierarchy.
mappedSwcServiceDependencyInSystem	<i>SwcServiceDependency</i>	0..1	iref	This represents the ability to point into the component hierarchy (under possible consideration of the root SoftwareComposition) InstanceRef implemented by: <i>SwcServiceDependencyInSystemInstanceRef</i>
serviceInstance	<i>DiagnosticServiceInstance</i>	0..1	ref	This represents the service instance that needs to be considered in this diagnostics service mapping.

Table 5.128: DiagnosticServiceSwMapping

[TPS_DEXT_01044] *BswServiceDependency* needs to act as the target of a reference [The intention of *DiagnosticServiceSwMapping.mappedBswServiceDependency* is to refer to a *BswServiceDependency* in the same way as e.g. *DiagnosticServiceSwMapping.mappedFlatSwcServiceDependency* does.

However, *BswServiceDependency* is not derived from meta-class *Referrable* and can therefore never become the target of a reference like *DiagnosticServiceSwMapping.mappedBswServiceDependency*.

The remedy for this issue is to define meta-class *BswServiceDependencyIdent* that inherits from *IdentCaption* that in turn inherits from *Referrable*.

Then, by aggregating `BswServiceDependencyIdent` at `BswServiceDependency` in the role `ident` `BswServiceDependency` can **factually** become the target of the reference and thus the original idea of `DiagnosticServiceSwMapping.mappedBswServiceDependency` becomes feasible.] ([RS_DEXT_00052](#))

Please find further details in Figure 5.41.

Please note that the introduction [[TPS_DEXT_01044](#)], although being dangerously close to a hack, is necessary to keep the AUTOSAR XML Schema fully backwards-compatible.

In other words, if `BswServiceDependency` were updated to inherit from `Referrable` the consequence would be that all existing AUTOSAR models that contain instances `BswServiceDependency` would suddenly become invalid because `Referrable.shortName` is a mandatory attribute in the AUTOSAR XML Schema.

Class	<code>BswServiceDependencyIdent</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping			
Note	This meta-class is created to add the ability to become the target of a reference to the non- <code>Referrable</code> <code>BswServiceDependency</code> .			
Base	<code>ARObject</code> , <code>AtpClassifier</code> , <code>AtpFeature</code> , <code>AtpStructureElement</code> , <code>IdentCaption</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 5.129: `BswServiceDependencyIdent`

[constr_1346] Allowed values of `DiagnosticServiceSwMapping.serviceInstance` [The applicability of the `DiagnosticServiceSwMapping` is limited to pre-defined set of diagnostic services.

By regulation of the AUTOSAR standard, `DiagnosticServiceSwMapping.serviceInstance` shall only point to the following sub-classes of `DiagnosticServiceInstance`:

- `DiagnosticRoutine`
- `DiagnosticSecurityAccess`
- `DiagnosticReadDataByIdentifier`
- `DiagnosticWriteDataByIdentifier`
- `DiagnosticIOControl`

]()

[constr_1347] Existence of attributes of `DiagnosticServiceSwMapping` [For any given `DiagnosticServiceSwMapping`, **one and only one** of the following references shall exist:

- `DiagnosticServiceSwMapping.mappedFlatSwcServiceDependency`

- `DiagnosticServiceSwMapping.mappedSwcServiceDependencyInSystem`
- `DiagnosticServiceSwMapping.mappedBswServiceDependency`

`]()`

[[constr_1347](#)], among further clarifications, reflects the fact that at most a single `SwcServiceDependency` can be referenced by a `DiagnosticServiceSwMapping` and this `SwcServiceDependency` cannot be identified by both `mappedSwcServiceDependencyInSystem` and `mappedFlatSwcServiceDependency`.

5.8.3 Security Event Reporting Mode Mapping

The reporting mode of particular security events (see [[20](#)]) can be updated via diagnostic services.

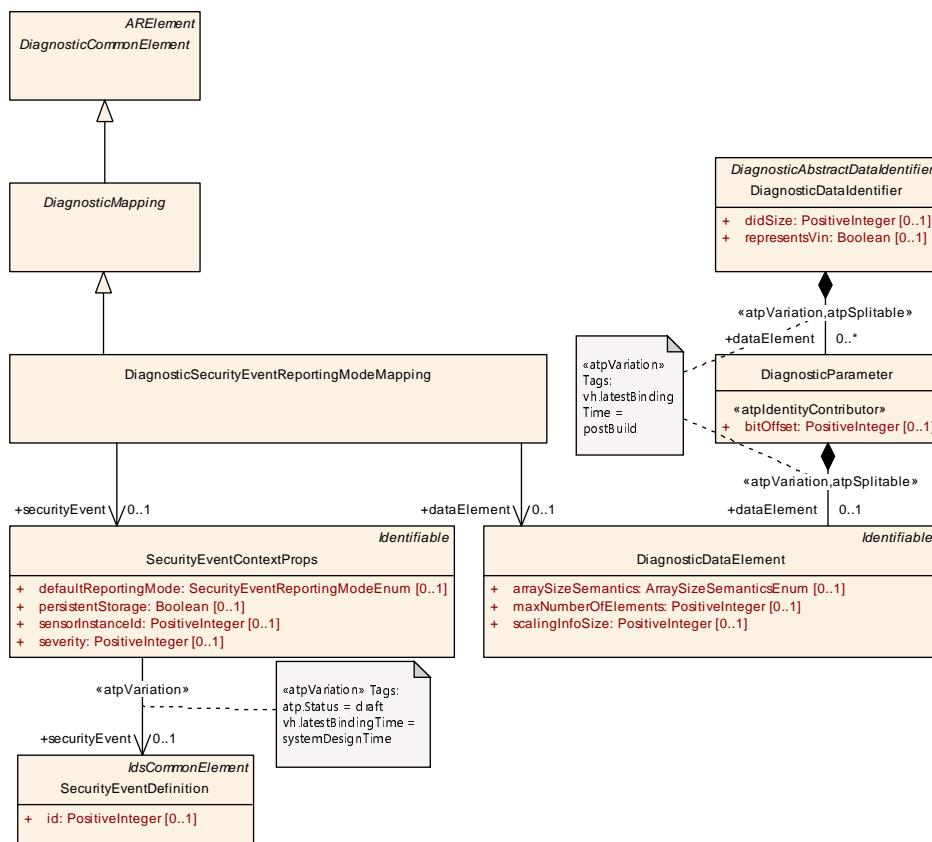


Figure 5.42: Modeling of the security event reporting model mapping

[[TPS_DEXT_01152](#)]{DRAFT} Semantics of meta-class `DiagnosticSecurityEventReportingModeMapping` [For this purpose, it is necessary to reserve a spot in a DID over which the new value for the reporting mode can be transferred from a diagnostic tester to the diagnostic stack on the target Ecu, and from there to the IdsM [[21](#)].

From the modeling point of view, this relation is created by means of meta-class `DiagnosticSecurityEventReportingModeMapping`.] (*RS_DEXT_00081*)

It is important to understand that this mapping is used to formalize the relation of two basic software modules to each other. No kind of application software is involved in this relation.

Class	<code>DiagnosticSecurityEventReportingModeMapping</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping			
Note	This meta-class represents the ability to associate a location in a DID with a security event. The purpose of this mapping is that the location in the DID contains the setting of the reporting mode for the specific security event. This means that the reporting mode of the security event can be set via the diagnostic service WriteDataByIdentifier. Tags: atp.Status=draft atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticMapping</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataElement	<code>DiagnosticDataElement</code>	0..1	ref	This reference identifies the data element that carries the information about the reporting mode. Tags: atp.Status=draft
securityEvent	<code>SecurityEventContextProps</code>	0..1	ref	This reference identifies the mapped security event. Tags: atp.Status=draft

Table 5.130: DiagnosticSecurityEventReportingModeMapping

[**constr_10024**] {DRAFT} **Existence of reference in the role `DiagnosticSecurityEventReportingModeMapping.dataElement`** [For each `DiagnosticSecurityEventReportingModeMapping`, the reference to `DiagnosticDataElement` in the role `dataElement` shall exist **at the time when the DEXT is complete.**] ()

[**constr_10025**] {DRAFT} **Existence of reference in the role `DiagnosticSecurityEventReportingModeMapping.securityEvent`** [For each `DiagnosticSecurityEventReportingModeMapping`, the reference to `SecurityEventContextProps` in the role `securityEvent` shall exist **at the time when the DEXT is complete.**] ()

6 Diagnostic Event Handling

6.1 Introduction

This subchapter describes the meta-model elements that define the handling of and the functionality around diagnostic events.

In a standard AUTOSAR Basic Software architecture, the definitions based on the model elements described in this subchapter are realized by the Diagnostic Event Manager (`Dem`) module.

The following figure gives an overview on the model elements related to the diagnostic event functionality.

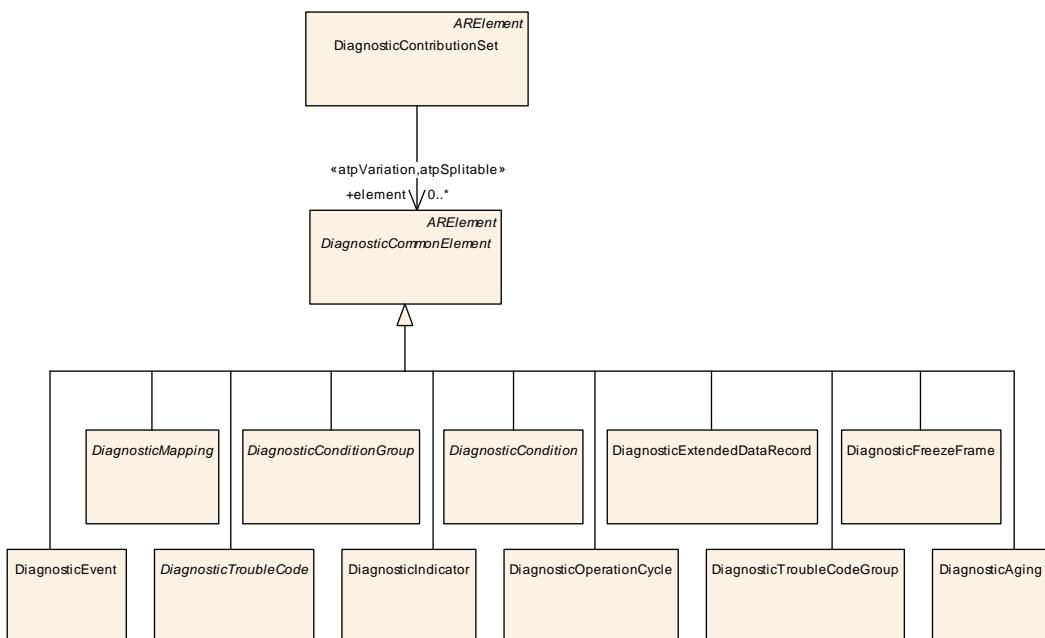


Figure 6.1: Common model elements relevant for the Dem

For the definition of the diagnostic event functionality, a number of model elements are derived from [DiagnosticCommonElement](#). These elements are described in the following sub-chapters.

6.2 DiagnosticEvent

6.2.1 Overview

[TPS_DEXT_01083] Semantics of a `DiagnosticEvent` [A `DiagnosticEvent` - the atomic unit handled by the `Dem` module - has to be defined together with its properties which affect the event handling behavior and possible interfaces to software-components.] ([RS_DEXT_00023](#))

Figure 6.2 depicts the definition of [DiagnosticEvent](#) together with its properties.

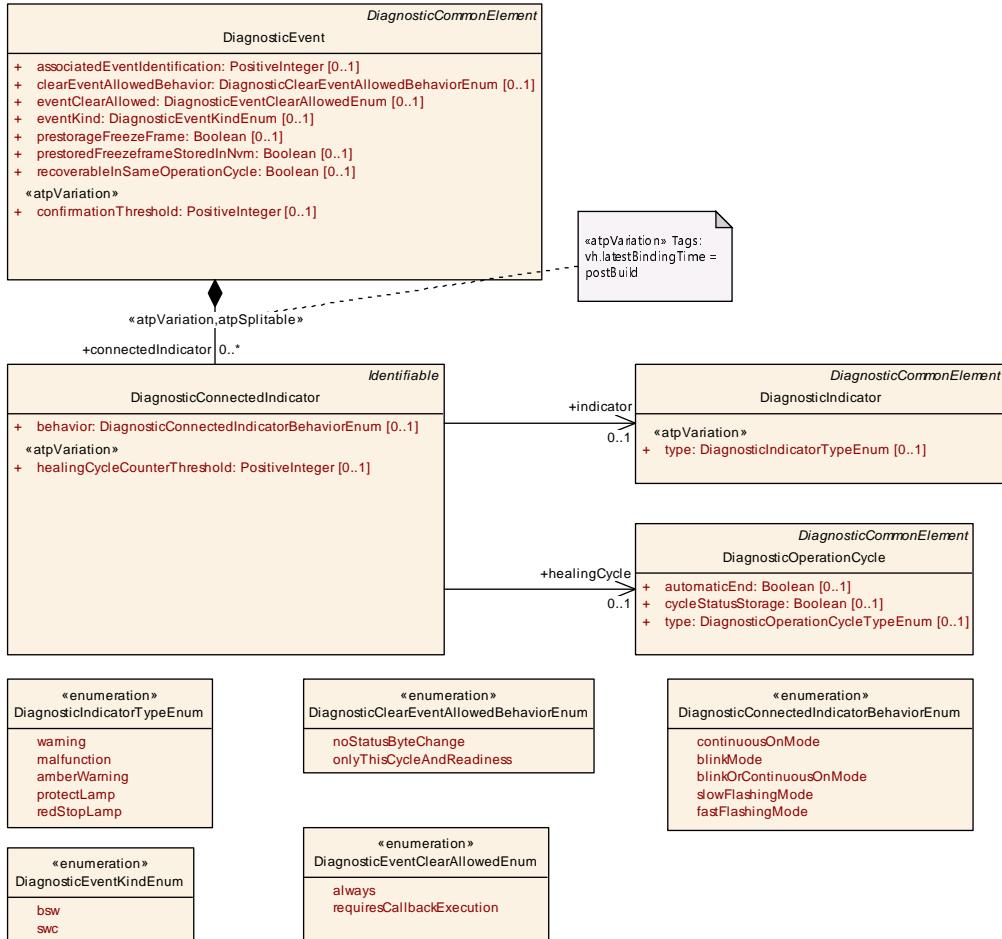


Figure 6.2: Modeling of [DiagnosticEvent](#)

The [DiagnosticExtract](#) allows the definition of an arbitrary number of [DiagnosticEvents](#).

Although the exchange of a [DiagnosticExtract](#) between companies usually involves [DiagnosticEvents](#) related to SWC functionality, the event kind BSW is also supported in order to enable definition of handling of BSW events (e.g. definition of associated [DiagnosticTroubleCode](#)).

[TPS_DEXT_03011] Clearing request for a [DiagnosticEvent](#) [Furthermore, a clearing request for a [DiagnosticEvent](#) might require invocation of a callback to a SWC in order to allow or to prohibit the clearing operation.]

The expectation on this callback interface can be expressed using the attribute `eventClearAllowed`:

- `always` indicates that a clearing request for the [DiagnosticEvent](#) **shall unconditionally be executed**.
- In case of `requiresCallbackExecution`, the **execution of a callback shall decide whether the clearing is permitted**.

In other words, the implementation of this decision is up to the developer of the corresponding [AtomicSwComponentType](#).

The latter shall define a [SwcServiceDependency](#) with appropriate [DiagnosticEventNeeds](#) and a [RoleBasedPortAssignment](#) where the value of the attribute `role` is set to `CallbackClearEventAllowed`.

] ([RS_DEXT_00023](#))

Class	DiagnosticEvent			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This element is used to configure DiagnosticEvents. Tags: atp.recommendedPackage=DiagnosticEvents			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
associated Event Identification	PositiveInteger	0..1	attr	<p>This attribute represents the identification number that is associated with the enclosing DiagnosticEvent and allows to identify it when placed into a snapshot record or extended data record storage.</p> <p>This value can be reported as internal data element in snapshot records or extended data records.</p>
clearEvent Allowed Behavior	DiagnosticClearEventAllowedBehaviorEnum	0..1	attr	This attribute defines the resulting UDS status byte for the related event, which shall not be cleared according to the ClearEventAllowed callback
confirmation Threshold	PositiveInteger	0..1	attr	<p>This attribute defines the number of operation cycles with a failed result before a confirmed DTC is set to 1. The semantic of this attribute is a by "1" increased value compared to the confirmation threshold of the "trip counter" mentioned in ISO 14229-1 in figure D.4. A value of "1" defines the immediate confirmation of the DTC along with the first reported failed. This is also sometimes called "zero trip DTC". A value of "2" defines a DTC confirmation in the operation cycle after the first occurred failed. A value of "2" is typically used in the US for OBD DTC confirmation.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
connected Indicator	DiagnosticConnectedIndicator	*	aggr	<p>Event specific description of Indicators.</p> <p>Stereotypes: atpSplittable; atpVariation Tags:atp.Splitkey=connectedIndicator.shortName, connected Indicator.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
eventClear Allowed	DiagnosticEventClearAllowedEnum	0..1	attr	This attribute defines whether the Dem has access to a "ClearEventAllowed" callback.
eventKind	DiagnosticEventKindEnum	0..1	attr	This attribute is used to distinguish between SWC and BSW events.
prestorage FreezeFrame	Boolean	0..1	attr	<p>This attribute describes whether the Prestorage of Freeze Frames is supported by the assigned event or not.</p> <p>True: Prestorage of FreezeFrames is supported</p> <p>False: Prestorage of FreezeFrames is not supported</p>





Class	DiagnosticEvent			
prestoredFreezeFrameStoredInNvm	Boolean	0..1	attr	If the Event uses a prestored freeze-frame (using the operations PrestoreFreezeFrame and ClearPrestoredFreezeFrame of the service interface DiagnosticMonitor) this attribute indicates if the Event requires the data to be stored in non-volatile memory. TRUE = Dem shall store the prestored data in non-volatile memory, FALSE = Data can be lost at shutdown (not stored in Nvm)
recoverableInSameOperationCycle	Boolean	0..1	attr	If the attribute is set to true then reporting PASSED will reset the indication of a failed test in the current operation cycle. If the attribute is set to false then reporting PASSED will be ignored and not lead to a reset of the indication of a failed test.

Table 6.1: DiagnosticEvent

Enumeration	DiagnosticClearEventAllowedBehaviorEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent
Note	This enumeration defines the possible behavior for clear event allowed
Literal	Description
noStatusByteChange	The event status byte keeps unchanged. Tags: atp.EnumerationLiteralIndex=0
onlyThisCycleAndReadiness	The OperationCycle and readiness bits of the event status byte are reset. Tags: atp.EnumerationLiteralIndex=1

Table 6.2: DiagnosticClearEventAllowedBehaviorEnum

Class	RoleBasedPortAssignment			
Package	M2::AUTOSARTemplates::SWComponentTemplate::SwInternalBehavior::ServiceMapping			
Note	This class specifies an assignment of a role to a particular service port (RPortPrototype or PPortPrototype) of an AtomicSwComponentType. With this assignment, the role of the service port can be mapped to a specific ServiceNeeds element, so that a tool is able to create the correct connector.			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
portPrototype	PortPrototype	0..1	ref	Service PortPrototype used in the assigned role. This PortPrototype shall either belong to the same AtomicSwComponentType as the SwInternalBehavior which owns the ServiceDependency or to the same NvBlockSwComponentType as the NvBlockDescriptor.
role	Identifier	0..1	attr	This is the role of the assigned Port in the given context. The value shall be a shortName of the Blueprint of a Port Interface as standardized in the Software Specification of the related AUTOSAR Service.

Table 6.3: RoleBasedPortAssignment

[TPS_DEXT_01085] DiagnosticEvent can be connected to one or multiple indicators [A DiagnosticEvent can be connected to one or multiple indicators (modeled by means of aggregating DiagnosticIndicator in the role connectedIndicator) of a certain type and with certain behavior.] ([RS_DEXT_00023](#))

Class	DiagnosticConnectedIndicator			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	Description of indicators that are defined per DiagnosticEvent.			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
behavior	DiagnosticConnectedIndicatorBehaviorEnum	0..1	attr	Behavior of the linked indicator.
healingCycle	DiagnosticOperationCycle	0..1	ref	The deactivation of indicators per event is defined as healing of a diagnostic event. The operation cycle in which the warning indicator will be switched off is defined here.
healingCycle Counter Threshold	PositiveInteger	0..1	attr	This attribute defines the number of healing cycles for the WarningIndicatorOffCriteria Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
indicator	DiagnosticIndicator	0..1	ref	Reference to the used indicator.

Table 6.4: DiagnosticConnectedIndicator

[constr_1829] Existence of reference `DiagnosticConnectedIndicator.indicator` [For each `DiagnosticConnectedIndicator`, the reference to `DiagnosticIndicator` in the role `indicator` shall exist **at the time when the DEXT is complete.**]()

[constr_1761] Existence of attribute `DiagnosticConnectedIndicator.healingCycle` [`DiagnosticConnectedIndicator.healingCycle` shall **only exist** if the value of `DiagnosticConnectedIndicator.healingCycleCounterThreshold` is **not equal to 0.**]()

Enumeration	DiagnosticEventClearAllowedEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent
Note	Denotes whether clearing of events is allowed.
Literal	Description
always	The clearing is allowed unconditionally. Tags: atp.EnumerationLiteralIndex=0
requiresCallback Execution	In case the clearing of a Diagnostic Event has to be allowed or prohibited through the SWC interface CallbackClearEventAllowed, the SWC has to indicate this by defining appropriate ServiceNeeds (i.e. DiagnosticEventNeeds). Tags: atp.EnumerationLiteralIndex=2

Table 6.5: DiagnosticEventClearAllowedEnum

Enumeration	DiagnosticEventKindEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent
Note	Applicability of the diagnostic event.
Literal	Description





<i>Enumeration</i>	DiagnosticEventKindEnum
bsw	The event is assigned to a BSW module. Tags: atp.EnumerationLiteralIndex=0
swc	The event is assigned to a SWC. Tags: atp.EnumerationLiteralIndex=1

Table 6.6: DiagnosticEventKindEnum

<i>Enumeration</i>	DiagnosticConnectedIndicatorBehaviorEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent
Note	Behavior of the indicator.
Literal	Description
blinkMode	The indicator blinks when the event has status FAILED. Tags: atp.EnumerationLiteralIndex=0
blinkOrContinuousOnMode	The indicator is active and blinks when the event has status FAILED. Tags: atp.EnumerationLiteralIndex=1
continuousOnMode	The indicator is active when the event has status FAILED. Tags: atp.EnumerationLiteralIndex=2
fastFlashingMode	Flash Indicator Lamp should be set to "Fast Flash". Tags: atp.EnumerationLiteralIndex=3
slowFlashingMode	Flash Indicator Lamp should be set to "Slow Flash". Tags: atp.EnumerationLiteralIndex=4

Table 6.7: DiagnosticConnectedIndicatorBehaviorEnum

6.2.2 Textual description

[TPS_DEXT_01067] Textually formulated content attached to **DiagnosticEvent**
 [The definition of a **DiagnosticEvent** also consists of textually formulated content that is formalized in structure but cannot be formalized in content.]

The purpose of this content is to define e.g. a mature condition that relates to the specific **DiagnosticEvent**.] (*RS_DEXT_00023, RS_DEXT_00045*)

[TPS_DEXT_01068] Textual description with respect to the **DiagnosticEvent**
 [Textual description that has the character of requirements with respect to the **DiagnosticEvent** shall be provided by means of the meta-class **StructuredReq**, i.e. by means of **introduction.structuredReq**.] (*RS_DEXT_00023, RS_DEXT_00045*)

Class	StructuredReq			
Package	M2::MSR::Documentation::BlockElements::RequirementsTracing			
Note	<p>This represents a structured requirement. This is intended for a case where specific requirements for features are collected.</p> <p>Note that this can be rendered as a labeled list.</p>			
Base	<i>ARObject, DocumentViewSelectable, Identifiable, MultilanguageReferrable, Paginateable, Referrable, Traceable</i>			
Attribute	Type	Mult.	Kind	Note
appliesTo	standardNameEnum	*	attr	<p>This attribute represents the platform the requirement is assigned to.</p> <p>Tags: xml.namePlural=APPLIES-TO-DEPENDENCIES xml.sequenceOffset=25</p>
conflicts	DocumentationBlock	0..1	aggr	<p>This represents an informal specification of conflicts.</p> <p>Tags:xml.sequenceOffset=40</p>
date	DateTime	1	attr	<p>This represents the date when the requirement was initiated.</p> <p>Tags:xml.sequenceOffset=5</p>
dependencies	DocumentationBlock	0..1	aggr	<p>This represents an informal specification of dependencies. Note that upstream tracing should be formalized in the property trace provided by the superclass Traceable.</p> <p>Tags:xml.sequenceOffset=30</p>
description	DocumentationBlock	0..1	aggr	<p>This represents the general description of the requirement.</p> <p>Tags:xml.sequenceOffset=10</p>
importance	String	1	attr	<p>This allows to represent the importance of the requirement.</p> <p>Tags:xml.sequenceOffset=8</p>
issuedBy	String	1	attr	<p>This represents the person, organization or authority which issued the requirement.</p> <p>Tags:xml.sequenceOffset=6</p>
rationale	DocumentationBlock	0..1	aggr	<p>This represents the rationale of the requirement.</p> <p>Tags:xml.sequenceOffset=20</p>
remark	DocumentationBlock	0..1	aggr	<p>This represents an informal remark. Note that this is not modeled as annotation, since these remark is still essential part of the requirement.</p> <p>Tags:xml.sequenceOffset=60</p>
supporting Material	DocumentationBlock	0..1	aggr	<p>This represents an informal specification of the supporting material.</p> <p>Tags:xml.sequenceOffset=50</p>
testedItem	Traceable	*	ref	<p>This association represents the ability to trace on the same specification level. This supports for example the of acceptance tests.</p> <p>Tags:xml.sequenceOffset=70</p>
type	String	1	attr	<p>This attribute allows to denote the type of requirement to denote for example is it an "enhancement", "new feature" etc.</p> <p>Tags:xml.sequenceOffset=7</p>





Class	StructuredReq			
useCase	DocumentationBlock	0..1	aggr	This describes the relevant use cases. Note that formal references to use cases should be done in the trace relation. Tags:xml.sequenceOffset=35

Table 6.8: StructuredReq

For more details regarding the modeling of the semi-formal text please refer to Figure 4.3.

[TPS_DEXT_01069] Standardized values of `DiagnosticEvent.introduction.structuredReq` [The following possible values of `DiagnosticEvent.introduction.structuredReq` are standardized by AUTOSAR:

- `DIAG_EVENT_MON_COND`: this value describes the monitoring condition of the corresponding `DiagnosticEvent`.
- `DIAG_EVENT_MON_TYPE`: this value describes the monitoring type of the corresponding `DiagnosticEvent`.
- `DIAG_EVENT_MON_RATE`: this value describes the monitoring rate for the corresponding `DiagnosticEvent`.
- `DIAG_EVENT_MAT_COND`: this value describes a mature condition of the `DiagnosticEvent`.
- `DIAG_EVENT_DEMAT_COND`: this value describes a de-mature condition of the `DiagnosticEvent`.
- `DIAG_EVENT_AGING`: this value describes the behavior of the `DiagnosticEvent` regarding aging.
- `DIAG_EVENT_LIMP_IN_ACT`: this value describes the associated limp-in action for the `DiagnosticEvent`.
- `DIAG_EVENT_MAT_TIME`: this value describes the mature time for the corresponding `DiagnosticEvent`, i.e. how long or how often the fault must exist.
- `DIAG_EVENT_DEMAT_TIME`: this value describes the de-mature time for the corresponding `DiagnosticEvent`, i.e. how long or how often must the OK conditions be fulfilled.

] ([RS_DEXT_00001](#), [RS_DEXT_00023](#), [RS_DEXT_00045](#))

The following ARXML fragment exemplifies the usage of `StructuredReq` along with the standardized values of the attribute `category` to attach semi-formal textual descriptions of an exemplary mature condition and a de-mature condition to a `DiagnosticEvent`.

Listing 6.1: Example for the definition of a semi-formal textual element in the context of a `DiagnosticEvent`

```
<DIAGNOSTIC-EVENT>
  <SHORT-NAME>ExampleEvent_0001</SHORT-NAME>
  <INTRODUCTION>
    <STRUCTURED-REQ>
      <SHORT-NAME>MatureCondition</SHORT-NAME>
      <CATEGORY>DIAG_EVENT_MAT_COND</CATEGORY>
      <DESCRIPTION>
        <P>
          <L-1 L="EN">This DTC is set if System Voltage is
          below 9 Volts</L-1>
        </P>
      </DESCRIPTION>
    </STRUCTURED-REQ>
    <STRUCTURED-REQ>
      <SHORT-NAME>DematureCondition</SHORT-NAME>
      <CATEGORY>DIAG_EVENT_DEMAT_COND</CATEGORY>
      <DESCRIPTION>
        <P>
          <L-1 L="EN">This DTC is set if System Voltage is
          above 10 Volts<XFILE><SHORT-NAME>
          Requirement_Specification</SHORT-NAME><URL>http:
          //autosar.org</URL></XFILE>
        </L-1>
        </P>
      </DESCRIPTION>
    </STRUCTURED-REQ>
  </INTRODUCTION>
  <CLEAR-EVENT-BEHAVIOR>ONLY-THIS-CYCLE-AND-READINESS</CLEAR-EVENT-
  BEHAVIOR>
  <EVENT-CLEAR-ALLOWED>ALWAYS</EVENT-CLEAR-ALLOWED>
  <EVENT-FAILURE-CYCLE-COUNTER-THRESHOLD>100</EVENT-FAILURE-CYCLE-COUNTER
  -THRESHOLD>
  <EVENT-KIND>SWC</EVENT-KIND>
  <PRESTORAGE-FREEZE-FRAME>false</PRESTORAGE-FREEZE-FRAME>
</DIAGNOSTIC-EVENT>
```

6.2.3 Associated Event Identification

[TPS_DEXT_01151] Semantics of attribute `DiagnosticEvent.associatedEventIdentification` [Use cases exist where `DiagnosticEvents` are not associated with the `DiagnosticTroubleCode` but the occurrence of the event shall nonetheless be reported as part of the `dtcProps.snapshotRecordContent.dataIdentifier` of a given `DiagnosticTroubleCodeUds`.]

For this purpose, it is necessary that the tester can identify the occurrence of the `DiagnosticEvent` by means of the value of attribute `DiagnosticEvent.associatedEventIdentification.`](RS_DEXT_00023)

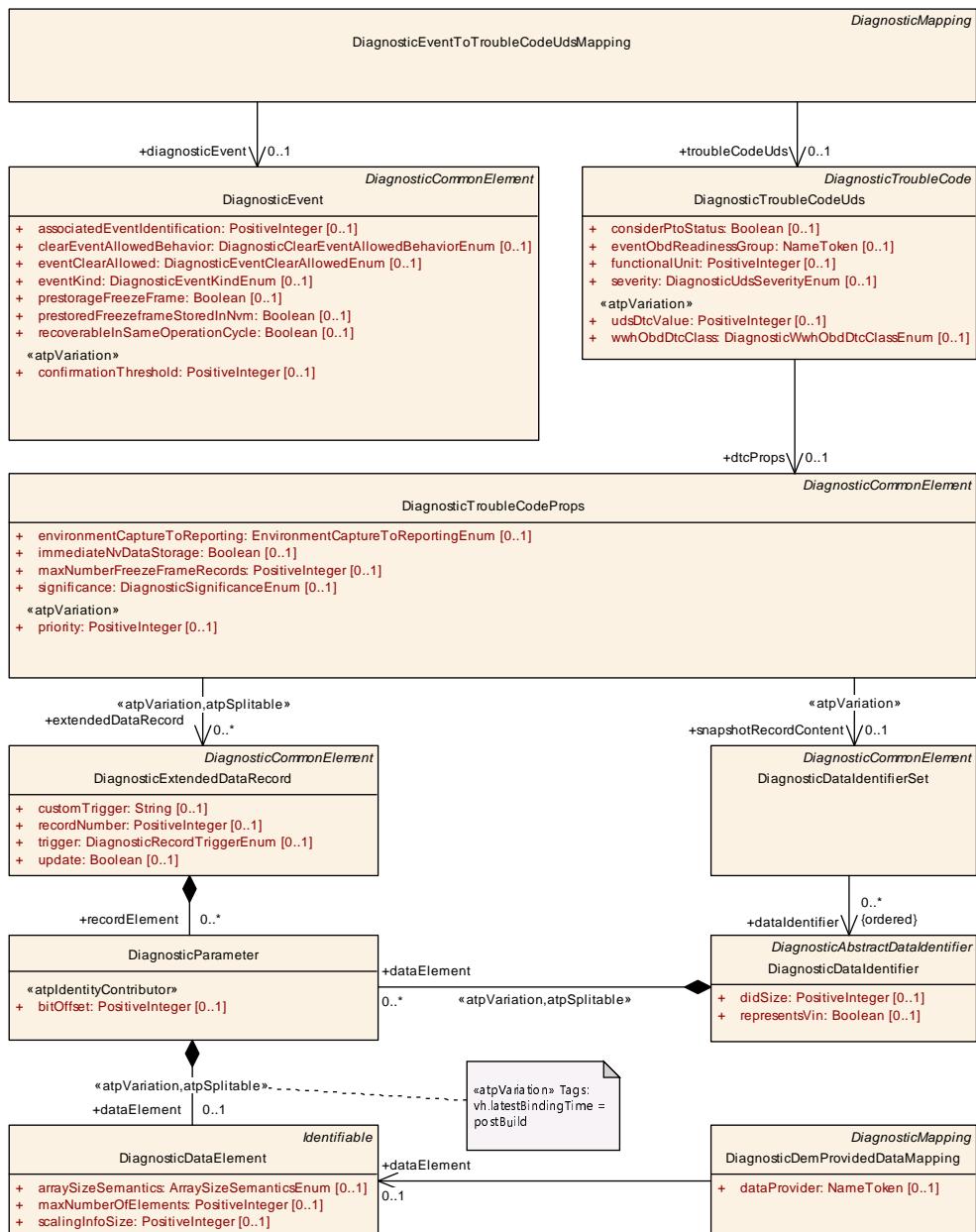


Figure 6.3: Modeling of associated event identification

[constr_1768] Existence of attribute **DiagnosticEvent.associatedEventIdentification** 「Attribute **DiagnosticEvent.associatedEventIdentification** shall exist if the respective **DiagnosticEvent** is mapped to a **DiagnosticTroubleCodeUds** and one of the following conditions is fulfilled:

- The reference **DiagnosticTroubleCodeUds.dtcProps.snapshotRecordContent** exists and the referenced **DiagnosticDataIdentifierSet** references at least one **dataIdentifier.dataElement.dataElement** that is also referenced by a **DiagnosticDemProvidedDataMapping** that has attribute **dataProvider** set to the value **DEM_EVENT_ASSOCIATED_IDENTIFICATION**.

- The reference `DiagnosticTroubleCodeUds.dtcProps.extendedDataRecord` exists and the referenced `DiagnosticExtendedDataRecord` aggregates at least one `recordElement.dataElement` that is also referenced by a `DiagnosticDemProvidedDataMapping` that has attribute `dataProvider` set to the value `DEM_EVENT_ASSOCIATED_IDENTIFICATION`.

]()

The use case described in [TPS_DEXT_01151] and [constr_1768] is depicted in Figure 6.3.

Please note that [constr_1768] only describes the minimum viable scenario for the usage of attribute `DiagnosticEvent.associatedEventIdentification`. It is also possible that more than one `DiagnosticDataElement` exists that is referenced by a `DiagnosticDemProvidedDataMapping` where attribute `dataProvider` is set to the value `DEM_EVENT_ASSOCIATED_IDENTIFICATION`.

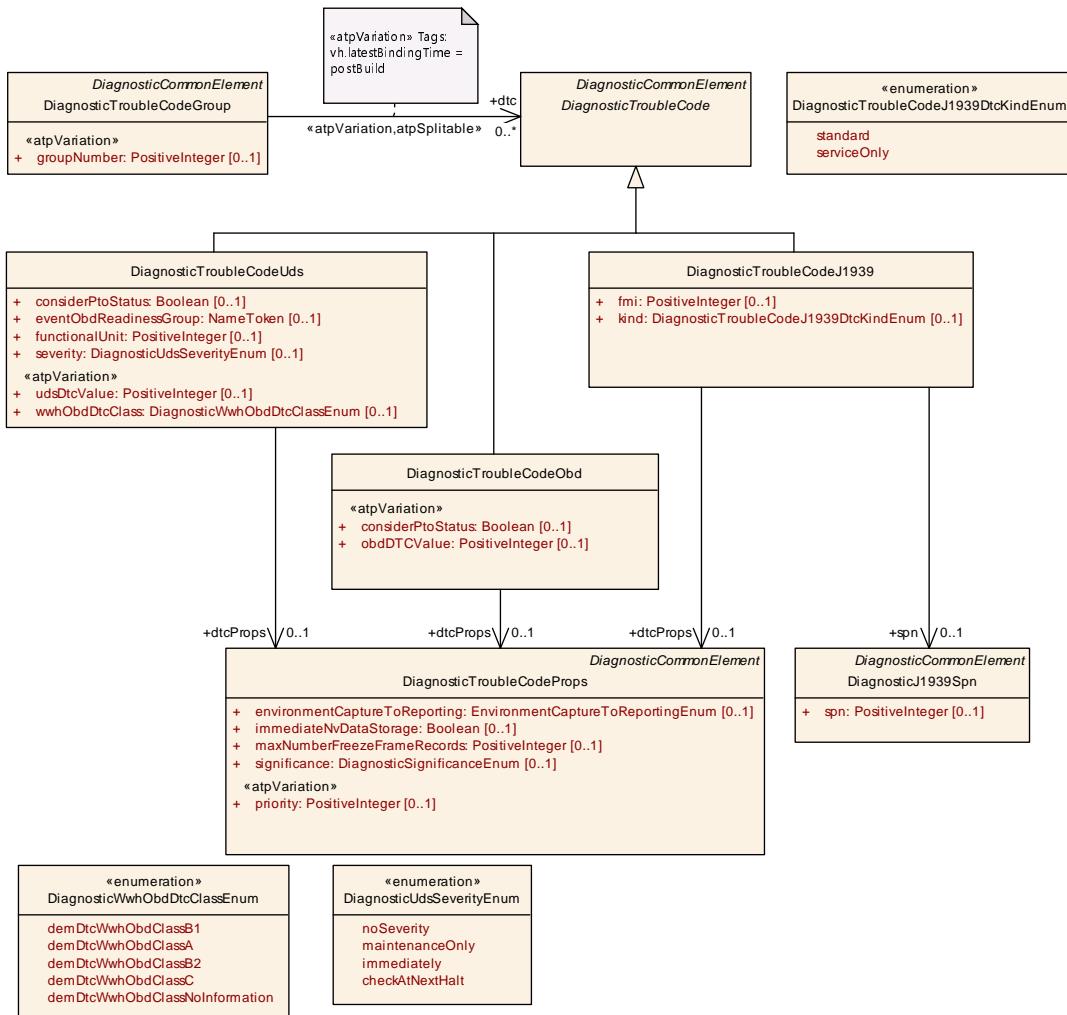
6.3 DiagnosticTroubleCode

`DiagnosticTroubleCodes` (i.e. the ECU external view on diagnostic events) are defined together with their properties and mapped to `DiagnosticEvents` using `DiagnosticEventToTroubleCodeUdsMapping`.

[TPS_DEXT_03012] **Three kinds of DTCs** [There are three kinds of DTCs represented as specializations of `DiagnosticTroubleCode`:

- non OBD relevant DTCs (`DiagnosticTroubleCodeUds`)
- OBD relevant DTCs (`DiagnosticTroubleCodeObd`)
- J1939 [22] relevant DTCs (`DiagnosticTroubleCodeJ1939`)

Properties individual to such a DTC specialization are modeled as attributes of `DiagnosticTroubleCodeUds`, `DiagnosticTroubleCodeObd` and `DiagnosticTroubleCodeJ1939`, respectively.] (RS_DEXT_00024)


Figure 6.4: Modeling of DiagnosticTroubleCode

Class	DiagnosticTroubleCodeUds			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This element is used to describe non OBD-relevant DTCs. Tags: atp.recommendedPackage=DiagnosticTroubleCodes			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticTroubleCode, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
considerPtoStatus	Boolean	0..1	attr	This attribute describes the affection of the event by the Dem PTO handling. True: the event is affected by the Dem PTO handling. False: the event is not affected by the Dem PTO handling.
dtcProps	DiagnosticTroubleCodeProps	0..1	ref	Defined properties associated with the DemDTC.
eventObdReadinessGroup	NameToken	0..1	attr	This attribute specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This attribute is only applicable for emission-related ECUs.





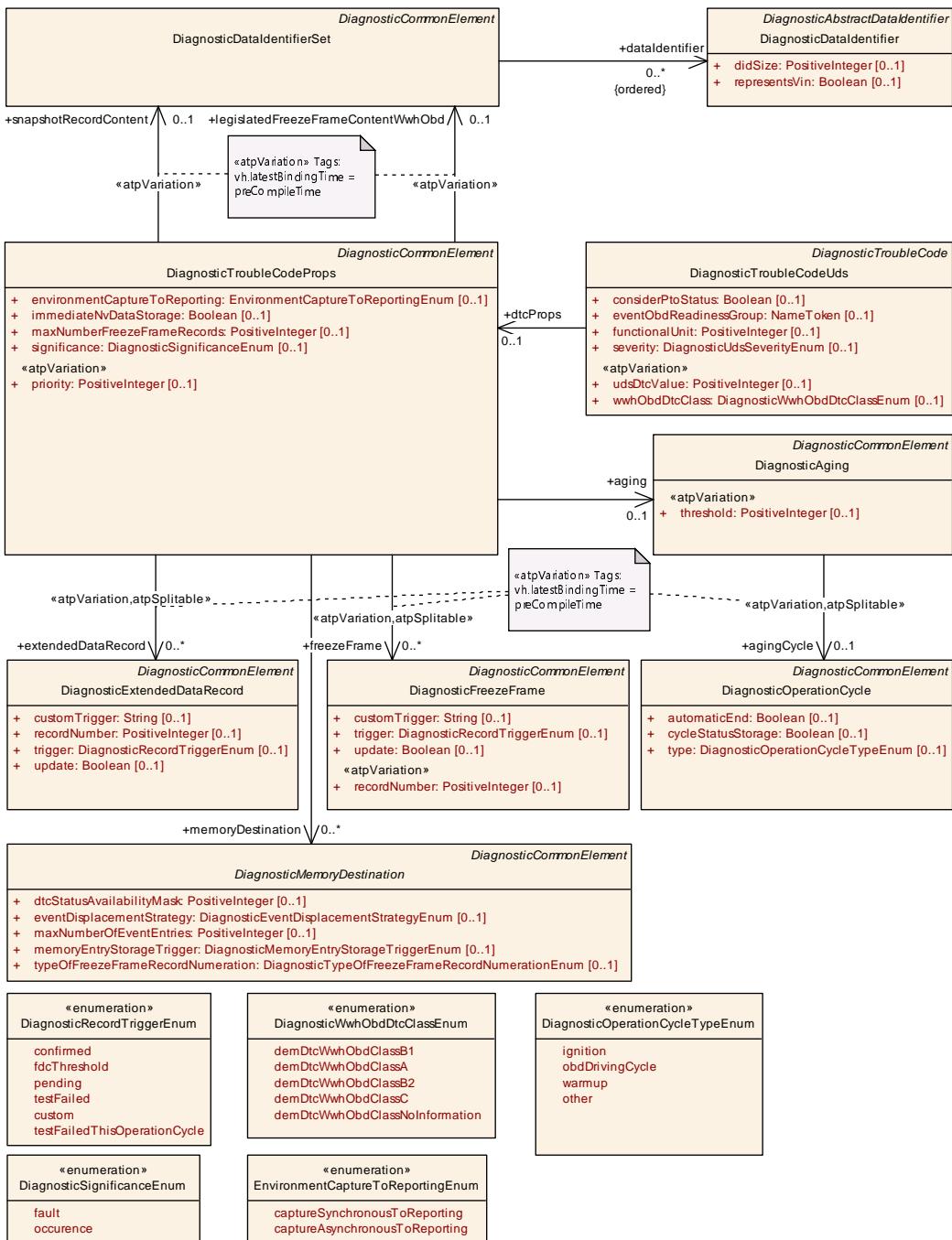
Class	DiagnosticTroubleCodeUds			
functionalUnit	PositiveInteger	0..1	attr	This attribute specifies a 1-byte value which identifies the corresponding basic vehicle / system function which reports the DTC. This parameter is necessary for the report of severity information.
severity	DiagnosticUdsSeverity Enum	0..1	attr	DTC severity according to ISO 14229-1.
udsDtcValue	PositiveInteger	0..1	attr	Unique Diagnostic Trouble Code value for UDS. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
wwhObdDtc Class	DiagnosticWwhObdDtc ClassEnum	0..1	attr	This attribute is used to identify (if applicable) the corresponding severity class of an WWH-OBD DTC. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.9: DiagnosticTroubleCodeUds

[constr_1757] Existence of attribute `DiagnosticTroubleCodeUds.udsDtcValue` [For each `DiagnosticTroubleCodeUds`, attribute `udsDtcValue` shall exist at the time when the DEXT is complete.]()

Class	DiagnosticTroubleCodeObd			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This element is used to define OBD-relevant DTCs. Tags: atp.recommendedPackage=DiagnosticTroubleCodes			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticTroubleCode, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
considerPto Status	Boolean	0..1	attr	This attribute describes the affection of the event by the Dem PTO handling. True: the event is affected by the Dem PTO handling. False: the event is not affected by the Dem PTO handling. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
dtcProps	DiagnosticTroubleCode Props	0..1	ref	Defined properties associated with the DemDTC.
eventReadiness Group	EventObdReadiness Group	0..1	aggr	This aggregation allows for the variant definition of the attribute eventObdReadinessGroup. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=eventReadinessGroup, eventReadiness Group.variationPoint.shortLabel vh.latestBindingTime=postBuild
obdDTCValue	PositiveInteger	0..1	attr	Unique Diagnostic Trouble Code value for OBD. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.10: DiagnosticTroubleCodeObd


Figure 6.5: Modeling of DiagnosticTroubleCodeUds

Class	EventObdReadinessGroup
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	This meta-class represents the ability to define the value of attribute eventObdReadinessGroup. It is only introduced to allow for a variant modeling of this attribute.
Base	<i>ARObject</i>





Class	EventObdReadinessGroup			
Attribute	Type	Mult.	Kind	Note
eventObd Readiness Group	NameToken	0..1	attr	This attribute specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This attribute is only applicable for emission-related ECUs.

Table 6.11: EventObdReadinessGroup

[constr_1758] Existence of attribute `DiagnosticTroubleCodeObd.obdDTCValue` [For each `DiagnosticTroubleCodeObd`, attribute `obdDTCValue` shall exist at the time when the DEXT is complete.]()

[TPS_DEXT_03013] Common properties of a DTC [Properties that are often common for a group of `DiagnosticTroubleCodeUds` elements are modeled as attributes of `DiagnosticTroubleCodeProps`.] (*RS_DEXT_00024*)

[constr_1349] Value of `udsDtcValue` shall be unique [The value of `DiagnosticTroubleCodeUds.udsDtcValue` shall be unique for all `DiagnosticTroubleCodeUds` that refer to the same `DiagnosticMemoryDestination` via the reference `DiagnosticTroubleCodeUds.dtcProps.memoryDestination`.]()

Class	<code>DiagnosticTroubleCode</code> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	A diagnostic trouble code defines a unique identifier that is shown to the diagnostic tester.			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Subclasses	<code>DiagnosticTroubleCodeJ1939</code> , <code>DiagnosticTroubleCodeObd</code> , <code>DiagnosticTroubleCodeUds</code>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.12: DiagnosticTroubleCode

[TPS_DEXT_03014] Semantics of `DiagnosticTroubleCodeGroup` [The `DiagnosticTroubleCodeGroup` element is used to define groups of DTCs that belong together. Each `DiagnosticTroubleCodeGroup` has its own `groupNumber` value assigned.] (*RS_DEXT_00024*)

Class	<code>DiagnosticTroubleCodeGroup</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	The diagnostic trouble code group defines the DTCs belonging together and thereby forming a group. Tags:atp.recommendedPackage=DiagnosticTroubleCodes			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticTroubleCodeGroup			
dtc	DiagnosticTroubleCode	*	ref	<p>This represents the collection of DiagnosticTroubleCodes defined by this DiagnosticTroubleCodeGroup.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=dtc.diagnosticTroubleCode, dtc.variation Point.shortLabel vh.latestBindingTime=postBuild</p>
groupNumber	PositiveInteger	0..1	attr	<p>This represents the base number of the DTC group.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>

Table 6.13: DiagnosticTroubleCodeGroup

[constr_1830] Existence of DiagnosticTroubleCodeGroup.groupNumber [For each DiagnosticTroubleCodeGroup, attribute groupNumber shall exist **at the time when the DEXT is complete.**.]()

[constr_1350] Value of DiagnosticTroubleCodeGroup.groupNumber shall be unique [The value of DiagnosticTroubleCodeGroup.groupNumber shall be unique to any other DTC and DTC group value.]()

[constr_1351] Value of DiagnosticTroubleCodeGroup.groupNumber [To be compliant to ISO, the value of DiagnosticTroubleCodeGroup.groupNumber shall be set as defined in ISO 14229-1 [16].]()

[TPS_DEXT_03000] ISO 14229-1 reserves values of DiagnosticTroubleCodeGroup.groupNumber [Any values other than those mentioned in [constr_1351] are reserved by ISO 14229-1 [16].] (*RS_DEXT_00024*)

[constr_1352] Existence of maxNumberFreezeFrameRecords vs. freezeFrame [If the attribute DiagnosticTroubleCodeProps.maxNumberFreezeFrameRecords exists than the attribute DiagnosticTroubleCodeProps.freezeFrame shall not exist or vice versa.]()

[constr_1353] Applicability of [1352] [[constr_1352] shall apply in the identical way (either one or the other attribute shall exist) for all DiagnosticTroubleCodeProps within the context of all DiagnosticContributionSets of category DIAGNOSTIC_ECU_EXTRACT that refer to the same EcuInstance.]()

[constr_1354] Existence of attribute DiagnosticTroubleCodeProps.snapshotRecordContent [If one of the attributes DiagnosticTroubleCodeProps.maxNumberFreezeFrameRecords or DiagnosticTroubleCodeProps.freezeFrame exists then the attribute DiagnosticTroubleCodeProps.snapshotRecordContent shall exist.]()

[TPS_DEXT_01064] Textually formulated content attached to DiagnosticTroubleCode [The definition of a DiagnosticTroubleCode also consists of textually formulated content that is formalized in structure but cannot be formalized in content.]

The purpose of this content is to define e.g. an error text or the possible cause that relates to the specific [DiagnosticTroubleCode.](#)]([RS_DEXT_00024](#), [RS_DEXT_00045](#))

[TPS_DEXT_01065] Different approaches to provide semi-formal textual content attached to a [DiagnosticTroubleCode](#) [There are different approaches to provide semi-formal textual content attached to a [DiagnosticTroubleCode](#):

- Textual description that has the character of descriptions of the [DiagnosticTroubleCode](#) shall be provided by means of the meta-class [TraceableText](#), i.e. by means of [introduction.trace](#).
- Textual description that characterizes the [DiagnosticTroubleCode](#) with respect to the *ODX long name* shall be provided by means of the attribute [longName](#).

] ([RS_DEXT_00024](#), [RS_DEXT_00045](#))

Class	TraceableText			
Package	M2::MSR::Documentation::BlockElements::RequirementsTracing			
Note	This meta-class represents the ability to denote a traceable text item such as requirements etc. The following approach applies: <ul style="list-style-type: none"> • shortName represents the tag for tracing • longName represents the head line • category represents the kind of the tagged text 			
Base	ARObject , DocumentViewSelectable , Identifiable , MultilanguageReferrable , Paginateable , Referrable , Traceable			
Attribute	Type	Mult.	Kind	Note
text	DocumentationBlock	1	aggr	This represents the text to which the tag applies. Tags: xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

Table 6.14: TraceableText

Class	MultilanguageReferrable (abstract)			
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::Identifiable			
Note	Instances of this class can be referred to by their identifier (while adhering to namespace borders). They also may have a longName. But they are not considered to contribute substantially to the overall structure of an AUTOSAR description. In particular it does not contain other Referrables.			
Base	ARObject , Referrable			
Subclasses	Caption , DefItem , DocumentationContext , Identifiable , SdgCaption , TraceReferrable , Traceable			
Attribute	Type	Mult.	Kind	Note
longName	MultilanguageLongName	0..1	aggr	This specifies the long name of the object. Long name is targeted to human readers and acts like a headline.

Table 6.15: MultilanguageReferrable

For more details regarding the modeling of the semi-formal text please refer to Figure 4.3.

The usage of `TraceableText` and `StructuredReq` alone would not qualify as a semi-formal textual attachment. It is necessary to standardize the value of the `category` in order to get some level of semi-formal textual description.

[TPS_DEXT_01066] Standardized values of `DiagnosticTroubleCode.introduction.trace` [The following possible values of `DiagnosticTroubleCode.introduction.trace` are standardized by AUTOSAR:

- **DIAG_DTC_ERROR_TEXT**: this value shall be used to describe an error text.
- **DIAG_DTC REP ACT**: this value describes the associated repair for the corresponding `DiagnosticTroubleCode`.
- **DIAG_DTC_CUS_PER_SYMP**: this value describes the possible customer perception symptom for the corresponding `DiagnosticTroubleCode`.
- **DIAG_DTC_POSS_CAUSE**: This value describes the possible cause for the corresponding `DiagnosticTroubleCode`.

] (`RS_DEXT_00001`, `RS_DEXT_00024`, `RS_DEXT_00045`)

The following ARXML fragment exemplifies the usage of `TraceableText` along with the standardized values of the attribute `category` to attach semi-formal textual descriptions to a `DiagnosticTroubleCodeUds`.

Listing 6.2: Example for the definition of a semi-formal textual element in the context of a `DiagnosticTroubleCode`

```
<DIAGNOSTIC-TROUBLE-CODE-UDS>
  <SHORT-NAME>ExampleDTC_0001</SHORT-NAME>
  <LONG-NAME>
    <L-4 L="EN">My little ODX long name</L-4>
  </LONG-NAME>
  <DESC>
    <L-2 L="EN">This DTC is a System Error DTC</L-2>
  </DESC>
  <INTRODUCTION>
    <TRACE>
      <SHORT-NAME>MyErrorText</SHORT-NAME>
      <CATEGORY>DIAG_DTC_ERROR_TEXT</CATEGORY>
      <P>
        <L-1 L="LA">Lorem ipsum dolor sit amet, consectetur
          adipiscing elit</L-1>
      </P>
    </TRACE>
  </INTRODUCTION>
  <DTC-PROPS-REF DEST="DIAGNOSTIC-TROUBLE-CODE-PROPS">/AUTOSAR/
    UseCase_230/ExampleDTC_0001_Props</DTC-PROPS-REF>
  <FUNCTIONAL-UNIT>1</FUNCTIONAL-UNIT>
  <SEVERITY>CHECK-AT-NEXT-HALT</SEVERITY>
  <UDS-DTC-VALUE>0x000001</UDS-DTC-VALUE>
</DIAGNOSTIC-TROUBLE-CODE-UDS>
```

[constr_1376] Multiplicity of reference `DiagnosticTroubleCodeProps记忆力Destination` [For every given `DiagnosticTroubleCodeProps`, the reference

in the role `DiagnosticTroubleCodeProps.memoryDestination` shall not exceed the upper multiplicity 2. [constr_1377] applies.]()

[constr_1377] Existence of reference DiagnosticTroubleCodeProps.memory-Destination [The reference DiagnosticTroubleCodeProps.memoryDestination shall **only** have the upper multiplicity 2 **if one (and only one)** of the referenced DiagnosticTroubleCodeProps.memoryDestination is a DiagnosticMemoryDestinationMirror.]()

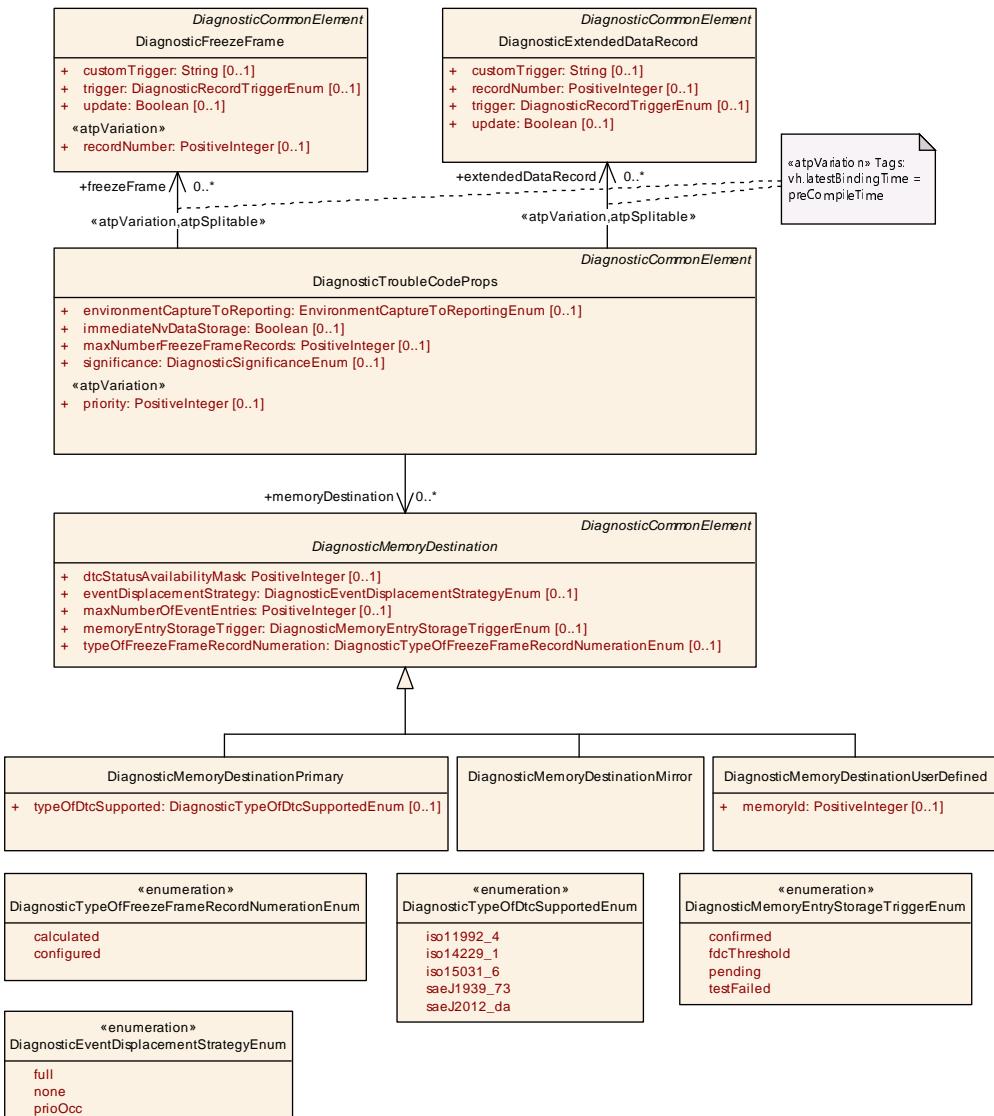


Figure 6.6: Modeling of DiagnosticMemoryDestination

Class	DiagnosticMemoryDestination (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This abstract meta-class represents a possible memory destination for a diagnostic event.			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	DiagnosticMemoryDestinationMirror , DiagnosticMemoryDestinationPrimary , DiagnosticMemoryDestinationUserDefined			
Attribute	Type	Mult.	Kind	Note
dtcStatusAvailabilityMask	PositiveInteger	0..1	attr	Mask for the supported DTC status bits by the Dem.
eventDisplacementStrategy	DiagnosticEvent DisplacementStrategyEnum	0..1	attr	This attribute defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.
maxNumberOfEventEntries	PositiveInteger	0..1	attr	This attribute fixes the maximum number of event entries in the fault memory.
memoryEntryStorageTrigger	DiagnosticMemoryEntry StorageTriggerEnum	0..1	attr	Describes the trigger to allocate an event memory entry.
typeOfFreezeFrameRecordNumeration	DiagnosticTypeOf FreezeFrameRecord NumerationEnum	0..1	attr	This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.

Table 6.16: DiagnosticMemoryDestination

Class	DiagnosticMemoryDestinationPrimary			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This represents a primary memory for a diagnostic event. Tags: atp.recommendedPackage=DiagnosticMemoryDestinations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryDestination, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
typeOfDtcSupported	DiagnosticTypeOfDtc SupportedEnum	0..1	attr	This attribute defines the format returned by Dem_DcmGetTranslationType and does not relate to/influence the supported Dem functionality.

Table 6.17: DiagnosticMemoryDestinationPrimary

Class	DiagnosticMemoryDestinationMirror			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This represents a mirror memory for a diagnostic event. Tags: atp.recommendedPackage=DiagnosticMemoryDestinations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryDestination, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.18: DiagnosticMemoryDestinationMirror

Class	DiagnosticMemoryDestinationUserDefined			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This represents a user-defined memory for a diagnostic event. Tags: atp.recommendedPackage=DiagnosticMemoryDestinations			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMemoryDestination, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
memoryId	PositiveInteger	0..1	attr	This represents the identifier of the user-defined memory.

Table 6.19: DiagnosticMemoryDestinationUserDefined

[constr_1378] Value of DiagnosticMemoryDestinationUserDefined.memoryId [Within the scope of one *DiagnosticContributionSet*, no two (or more) *DiagnosticMemoryDestinationUserDefineds* shall exist that share the same value for attribute *DiagnosticMemoryDestinationUserDefined.memoryId*]()

In other words, the value of the attribute *DiagnosticMemoryDestinationUserDefined.memoryId* shall be unique within any given *DiagnosticExtract*.

On top of that, it is necessary to make sure that only **one primary memory** and only **one mirror memory** is defined.

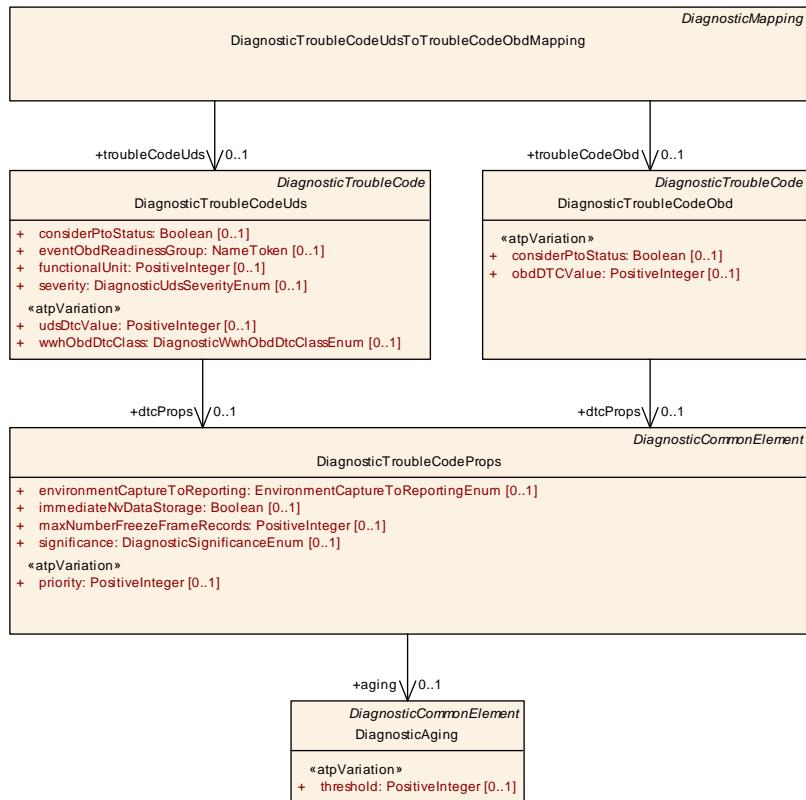


Figure 6.7: Mapping of UDS DTC to OBD DTC

[constr_1379] Existence of `DiagnosticMemoryDestinationPrimary` [Within the scope of one `DiagnosticContributionSet` only one `DiagnosticMemoryDestinationPrimary` shall exist.]()

[constr_1380] Existence of `DiagnosticMemoryDestinationMirror` [Within the scope of one `DiagnosticContributionSet` only one `DiagnosticMemoryDestinationMirror` shall exist.]()

[constr_1725] Applicability of attribute `DiagnosticMemoryDestination.dtcStatusAvailabilityMask` [Attribute `DiagnosticMemoryDestination.dtcStatusAvailabilityMask` shall not be defined in the context of a `DiagnosticMemoryDestinationMirror`.]()

[constr_1711] Restriction of applicability of attribute `typeOfFreezeFrameRecordNumeration` [The attribute `typeOfFreezeFrameRecordNumeration` shall not be used in the context of a `DiagnosticMemoryDestinationMirror`.]()

[TPS_DEXT_01094] Semantics of meta-class `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping` [The meta-class `DiagnosticTroubleCodeUdsToTroubleCodeObdMapping` can be used to associate a `DiagnosticTroubleCodeUds` with a `DiagnosticTroubleCodeObd`.]()

Class	<code>DiagnosticTroubleCodeProps</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This element defines common Dtc properties that can be reused by different non OBD-relevant DTCs. Tags: atp.recommendedPackage=DiagnosticTroubleCodeProps			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
aging	<code>DiagnosticAging</code>	0..1	ref	Reference to an aging algorithm in case that an aging/unlearning of the event is allowed.
environment CaptureTo Reporting	<code>EnvironmentCaptureToReportingEnum</code>	0..1	attr	This attribute determines the point in time, when the data actually is captured.
extendedData Record	<code>DiagnosticExtendedDataRecord</code>	*	ref	Defines the links to an extended data class sampler. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=extendedDataRecord.diagnosticExtendedDataRecord, extendedDataRecord.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
freezeFrame	<code>DiagnosticFreezeFrame</code>	*	ref	Define the links to a freeze frame class sampler. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=freezeFrame.diagnosticFreezeFrame, freezeFrame.variationPoint.shortLabel vh.latestBindingTime=preCompileTime





Class	DiagnosticTroubleCodeProps			
immediateNv DataStorage	Boolean	0..1	attr	Switch to enable immediate storage triggering of an according event memory entry persistently to NVRAM. true: immediate non-volatile storage triggering enabled false: immediate non-volatile storage triggering disabled
legislated FreezeFrame ContentWwh Obd	DiagnosticDataIdentifier Set	0..1	ref	This reference identifies the layout of the WWH-OBD freeze frame. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
maxNumber FreezeFrame Records	PositiveInteger	0..1	attr	This attribute defines the number of according freeze frame records, which can maximal be stored for this event. Therefore all these freeze frame records have the same freeze frame class.
memory Destination	DiagnosticMemory Destination	*	ref	The event destination assigns events to none, one or multiple origins.
priority	PositiveInteger	0..1	attr	Priority of the event, in view of full event buffer. A lower value means higher priority. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
significance	DiagnosticSignificance Enum	0..1	attr	Significance of the event, which indicates additional information concerning fault classification and resolution.
snapshot RecordContent	DiagnosticDataIdentifier Set	0..1	ref	This represents the freeze frame layout as a set of DIDs. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.20: DiagnosticTroubleCodeProps

[constr_1831] Existence of `DiagnosticTroubleCodeProps.priority` [For each `DiagnosticTroubleCodeProps`, attribute `priority` shall exist **at the time when the DEXT is complete.**.]()

Enumeration	DiagnosticSignificanceEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	Significance level of a diagnostic event.
Literal	Description
fault	Failure, which affects the component/ECU itself. Tags: atp.EnumerationLiteralIndex=0
occurence	Issue, which indicates additional information concerning insufficient system behavior. Tags: atp.EnumerationLiteralIndex=1

Table 6.21: DiagnosticSignificanceEnum

Enumeration	DiagnosticUdsSeverityEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	Severity types for a DTC according to ISO 14229-1.
Literal	Description





Enumeration	DiagnosticUdsSeverityEnum
checkAtNextHalt	Check at next halt. Tags: atp.EnumerationLiteralIndex=0
immediately	Check immediately. Tags: atp.EnumerationLiteralIndex=1
maintenanceOnly	Maintenance required. Tags: atp.EnumerationLiteralIndex=2
noSeverity	No severity information available. Tags: atp.EnumerationLiteralIndex=3

Table 6.22: DiagnosticUdsSeverityEnum

Class	DiagnosticDataIdentifierSet			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This represents the ability to define a list of DiagnosticDataIdentifiers that can be reused in different contexts. Tags: atp.recommendedPackage=DiagnosticDataIdentifierSets			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataIdentifier (ordered)	DiagnosticDataIdentifier	*	ref	Reference to an ordered list of Data Identifiers.

Table 6.23: DiagnosticDataIdentifierSet

Enumeration	DiagnosticWwhObdDtcClassEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	This meta-class represents the ability to model severity classes of an WWH-OBD DTC.
Literal	Description
demDtcWwhObd ClassA	This attribute represents the severity class A. Tags: atp.EnumerationLiteralIndex=0
demDtcWwhObd ClassB1	This attribute represents the severity class B1. Tags: atp.EnumerationLiteralIndex=1
demDtcWwhObd ClassB2	This attribute represents the severity class B2. Tags: atp.EnumerationLiteralIndex=2
demDtcWwhObd ClassC	This attribute represents the severity class C. Tags: atp.EnumerationLiteralIndex=3
demDtcWwhObd ClassNoInformation	This attribute represents the option to intentionally not describe a dedicated severity class of an WWH-OBD DTC. Tags: atp.EnumerationLiteralIndex=4

Table 6.24: DiagnosticWwhObdDtcClassEnum

Class	DiagnosticTroubleCodeUdsToTroubleCodeObdMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	This meta-class represents the ability to associate a UDS trouble code to an OBD trouble code. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
troubleCodeObd	DiagnosticTroubleCodeObd	0..1	ref	This represents the OBD DTC referenced in the mapping between UDS and OBD DTCs.
troubleCodeUds	DiagnosticTroubleCodeUds	0..1	ref	This represents the UDS DTC referenced in the mapping between UDS and OBD DTCs.

Table 6.25: DiagnosticTroubleCodeUdsToTroubleCodeObdMapping

Enumeration	DiagnosticTypeOfFreezeFrameRecordNumerationEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	FreezeFrame record numeration type
Literal	Description
calculated	Freeze frame records will be numbered consecutive starting by 1 in their chronological order. Tags: atp.EnumerationLiteralIndex=0
configured	Freeze frame records will be numbered based on the given configuration in their chronological order. Tags: atp.EnumerationLiteralIndex=1

Table 6.26: DiagnosticTypeOfFreezeFrameRecordNumerationEnum

6.4 DiagnosticExtendedDataRecord

[TPS_DEXT_03008] Semantics of DiagnosticExtendedDataRecord [A DiagnosticExtendedDataRecord contains DiagnosticDataElements that are ordered by the bitOffset.] (RS_DEXT_00032)

[constr_1355] Value of extendedDataRecord.recordNumber [To be compliant to ISO, the value of extendedDataRecord.recordNumber shall be set in the interval as defined in ISO 14229-1 [16].] ()

[constr_1509] extendedDataRecord.recordNumber shall be unique within primary fault memory [For all DiagnosticTroubleCodeProps that refer to DiagnosticMemoryDestinationPrimary in the role memoryDestination there shall be no two extendedDataRecord.recordNumber with the same value.] ()

[constr_1510] extendedDataRecord.recordNumber shall be unique within mirror fault memory [For all DiagnosticTroubleCodeProps that refer to DiagnosticMemoryDestinationMirror in the role memoryDestination there shall be no two extendedDataRecord.recordNumber with the same value.] ()

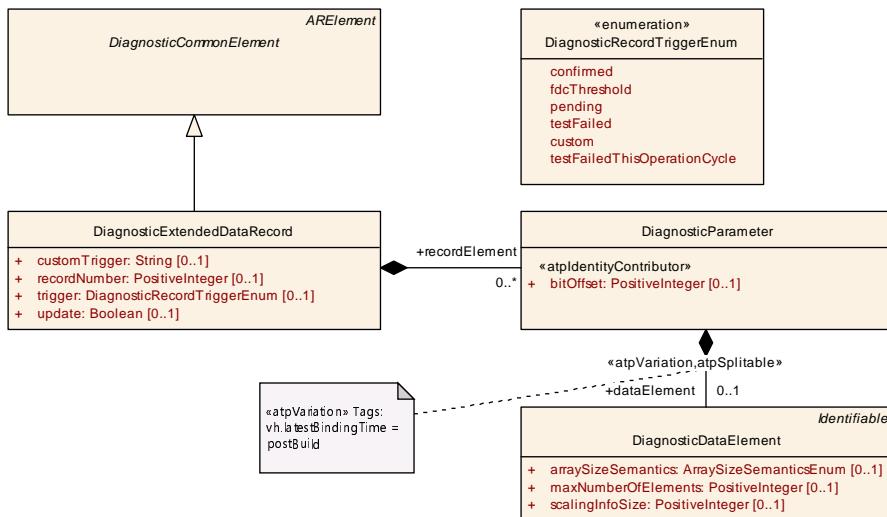


Figure 6.8: Modeling of DiagnosticExtendedDataRecord

[constr_1511] `extendedDataRecord.recordNumber` shall be unique within user-defined fault memory [For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationUserDefined` in the role `memoryDestination` there shall be no two `extendedDataRecord.recordNumber` with the same value for any `DiagnosticMemoryDestinationUserDefined` referenced as `DiagnosticTroubleCodeProps.memoryDestination` with a given value of `memoryId`.]()

[TPS_DEXT_01143] Definition of a custom trigger for an extended data record [It is possible to define a custom trigger for the capturing of an extended data record. The custom nature, however, severely limits the possibilities for a formal description of such a trigger. Therefore, AUTOSAR can only provide a means to verbally describe how the custom trigger shall operate.

For this purpose the attribute `DiagnosticExtendedDataRecord.customTrigger` has been defined.] ([RS_DEXT_00033](#))

[constr_1616] Existence of attribute `DiagnosticExtendedDataRecord.customTrigger` [The attribute `DiagnosticExtendedDataRecord.customTrigger` shall only exist if the attribute `DiagnosticExtendedDataRecord.trigger` is set to the value `DiagnosticRecordTriggerEnum.custom`.]()

Class	DiagnosticExtendedDataRecord			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticExtendedDataRecord			
Note	Description of an extended data record. Tags:atp.recommendedPackage=DiagnosticExtendedDataRecords			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
customTrigger	String	0..1	attr	This attribute shall be taken to verbally describe the nature of the custom trigger.





Class	DiagnosticExtendedDataRecord			
recordElement	DiagnosticParameter	*	aggr	Defined DataElements in the extended record element.
recordNumber	PositiveInteger	0..1	attr	This attribute specifies an unique identifier for an extended data record.
trigger	DiagnosticRecordTriggerEnum	0..1	attr	This attribute specifies the primary trigger to allocate an event memory entry.
update	Boolean	0..1	attr	<p>This attribute defines when an extended data record is captured.</p> <p>True: This extended data record is captured every time.</p> <p>False: This extended data record is only captured for new event memory entries.</p>

Table 6.27: DiagnosticExtendedDataRecord

[constr_1756] Existence of attributes `DiagnosticExtendedDataRecord.trigger` and `update` [For each `DiagnosticExtendedDataRecord`, attributes `trigger` and `update` shall only exist **at the time when the DEXT is complete** if at least one `DiagnosticDataElement` is aggregated by a `DiagnosticExtendedDataRecord.recordElement` in the role `dataElement` to which no reference in the role `DiagnosticDemProvidedDataMapping.dataElement` exists.]()

[constr_1760] Existence of `DiagnosticExtendedDataRecord.recordElement` [For each `DiagnosticExtendedDataRecord`, at least one aggregation of `DiagnosticParameter` in the role `recordElement` shall exist **at the time when the DEXT is complete**.]()

[constr_1832] Existence of `DiagnosticExtendedDataRecord.recordNumber` [For each `DiagnosticExtendedDataRecord`, attribute `recordNumber` shall exist **at the time when the DEXT is complete**.]()

Enumeration	DiagnosticRecordTriggerEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticFreezeFrame
Note	Triggers to allocate an event memory entry.
Literal	Description
confirmed	capture on "Confirmed" Tags: atp.EnumerationLiteralIndex=0
custom	implement custom capture Tags: atp.EnumerationLiteralIndex=4
fdcThreshold	capture on "FDC Threshold" Tags: atp.EnumerationLiteralIndex=1
pending	capture on "Pending" Tags: atp.EnumerationLiteralIndex=2
testFailed	capture on "Test Failed" Tags: atp.EnumerationLiteralIndex=3



△

<i>Enumeration</i>	DiagnosticRecordTriggerEnum
testFailedThisOperationCycle	Test Failed This Operation Cycle. Tags: atp.EnumerationLiteralIndex=5

Table 6.28: DiagnosticRecordTriggerEnum

[constr_1859] Usage of `DiagnosticRecordTriggerEnum.testFailedThisOperationCycle` [The enumeration value `DiagnosticRecordTriggerEnum.testFailedThisOperationCycle` shall only be used in the context of meta-class `DiagnosticFreezeFrame.`.]()

6.5 DiagnosticFreezeFrame

[TPS_DEXT_03009] Semantics of `DiagnosticFreezeFrame` [A `DiagnosticFreezeFrame` needs an ordered list of references to `DiagnosticDataIdentifiers`. However, this reference is not modeled directly but in the context of meta-class `DiagnosticTroubleCodeProps.`.] ([RS_DEXT_00033](#))

For more details, please refer to Figure 6.4.

[constr_1357] Value of `freezeFrame.recordNumber` [To be compliant to ISO, the value of `freezeFrame.recordNumber` shall be set in the interval as defined in ISO 14229-1 [16].]()

[constr_1512] `freezeFrame.recordNumber` shall be unique within primary fault memory [For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationPrimary` in the role `memoryDestination` there shall be no two `freezeFrame.recordNumber` with the same value.]()

[constr_1513] `freezeFrame.recordNumber` shall be unique within mirror fault memory [For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationMirror` in the role `memoryDestination` there shall be no two `freezeFrame.recordNumber` with the same value.]()

[constr_1514] `freezeFrame.recordNumber` shall be unique within user-defined fault memory [For all `DiagnosticTroubleCodeProps` that refer to `DiagnosticMemoryDestinationUserDefined` in the role `memoryDestination` there shall be no two `freezeFrame.recordNumber` with the same value for any `DiagnosticMemoryDestinationUserDefined` referenced as `DiagnosticTroubleCodeProps.memoryDestination` with a given value of `memoryId.`.]()

[TPS_DEXT_01144] Definition of a custom trigger for a freeze frame [It is possible to define a custom trigger for the capturing of a freeze frame. The custom nature, however, severely limits the possibilities for a formal description of such a trigger. Therefore, AUTOSAR can only provide a means to verbally describe how the custom trigger shall operate.]

For this purpose the attribute `DiagnosticFreezeFrame.customTrigger` has been defined.] ()
 (RS_DEXT_00033)

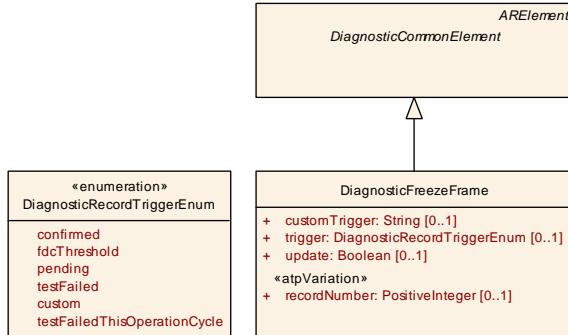


Figure 6.9: Modeling of DiagnosticFreezeFrame

[constr_1617] Existence of attribute `DiagnosticFreezeFrame.customTrigger` [The attribute `DiagnosticFreezeFrame.customTrigger` shall only exist if the attribute `DiagnosticFreezeFrame.trigger` is set to the value `DiagnosticRecordTriggerEnum.custom`.] ()

Class	DiagnosticFreezeFrame			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticFreezeFrame			
Note	This element describes combinations of DIDs for a non OBD relevant freeze frame. Tags:atp.recommendedPackage=DiagnosticFreezeFrames			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
customTrigger	String	0..1	attr	This attribute shall be taken to verbally describe the nature of the custom trigger.
recordNumber	PositiveInteger	0..1	attr	This attribute defines a record number for a freeze frame record. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
trigger	DiagnosticRecordTriggerEnum	0..1	attr	This attribute defines the primary trigger to allocate an event memory entry.
update	Boolean	0..1	attr	This attribute defines the approach when the freeze frame record is stored/updated. True: FreezeFrame record is captured every time. False: FreezeFrame record is only captured for new event memory entries.

Table 6.29: DiagnosticFreezeFrame

[constr_1833] Existence of `DiagnosticFreezeFrame.trigger` [For each `DiagnosticFreezeFrame`, attribute `trigger` shall exist **at the time when the DEXT is complete**.] ()

6.6 DiagnosticCondition

[TPS_DEXT_03010] Combination of `DiagnosticConditions` to `DiagnosticConditionGroups` [DiagnosticConditions are combined to DiagnosticConditionGroups and define a certain number of checks (e.g. correct voltage range) before the event report is accepted or the event gets qualified.] ([\(RS_DEXT_00027, RS_DEXT_00028, RS_DEXT_00030, RS_DEXT_00031\)](#))

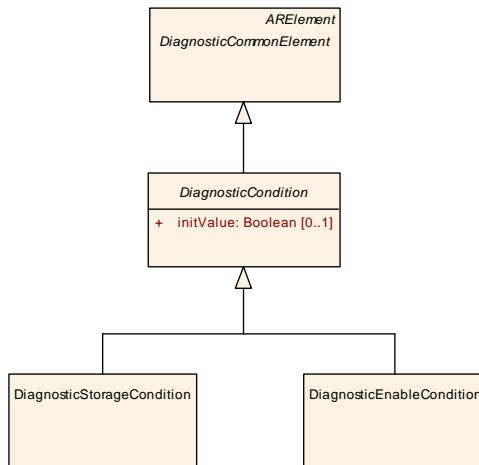


Figure 6.10: Modeling of DiagnosticCondition

[TPS_DEXT_03001] Different types of conditions [There are two different types of conditions: DiagnosticEnableConditions and DiagnosticStorageCondition:

- As long as the DiagnosticEnableCondition is not fulfilled, the event reports are not valid and therefore will not be accepted.
- As long as the DiagnosticStorageCondition is not fulfilled, the event is not stored in the event memory.

] ([\(RS_DEXT_00027\)](#))

Class	<i>DiagnosticCondition</i> (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticCondition			
Note	Abstract element for StorageConditions and EnableConditions.			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	<i>DiagnosticEnableCondition, DiagnosticStorageCondition</i>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticCondition (abstract)			
initValue	Boolean	0..1	attr	<p>Defines the initial status for enable or disable of acceptance/storage of event reports of a diagnostic event. The value is the initialization after power up (before this condition is reported the first time).</p> <p>true: acceptance/storage of a diagnostic event enabled</p> <p>false: acceptance/storage of a diagnostic event disabled</p>

Table 6.30: DiagnosticCondition

[constr_1834] Existence of `DiagnosticCondition.initValue` [For each `DiagnosticCondition`, attribute `initValue` shall exist **at the time when the DEXT is complete.**.]()

Class	DiagnosticEnableCondition			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticCondition			
Note	Specification of an enable condition. Tags: atp.recommendedPackage=DiagnosticConditions			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticCondition, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.31: DiagnosticEnableCondition

Class	DiagnosticStorageCondition			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticCondition			
Note	Specification of a storage condition. Tags: atp.recommendedPackage=DiagnosticConditions			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticCondition, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.32: DiagnosticStorageCondition

6.7 Diagnostic Debouncing

[TPS_DEXT_01048] Actual algorithm for the diagnostic event debouncing [The actual algorithm for the debouncing is represented by subclasses of `DiagEvent-DebounceAlgorithm` aggregated in the role `DiagnosticDebounceAlgorithm-Props.debounceAlgorithm`.] (*RS_DEXT_00023, RS_DEXT_00053*)

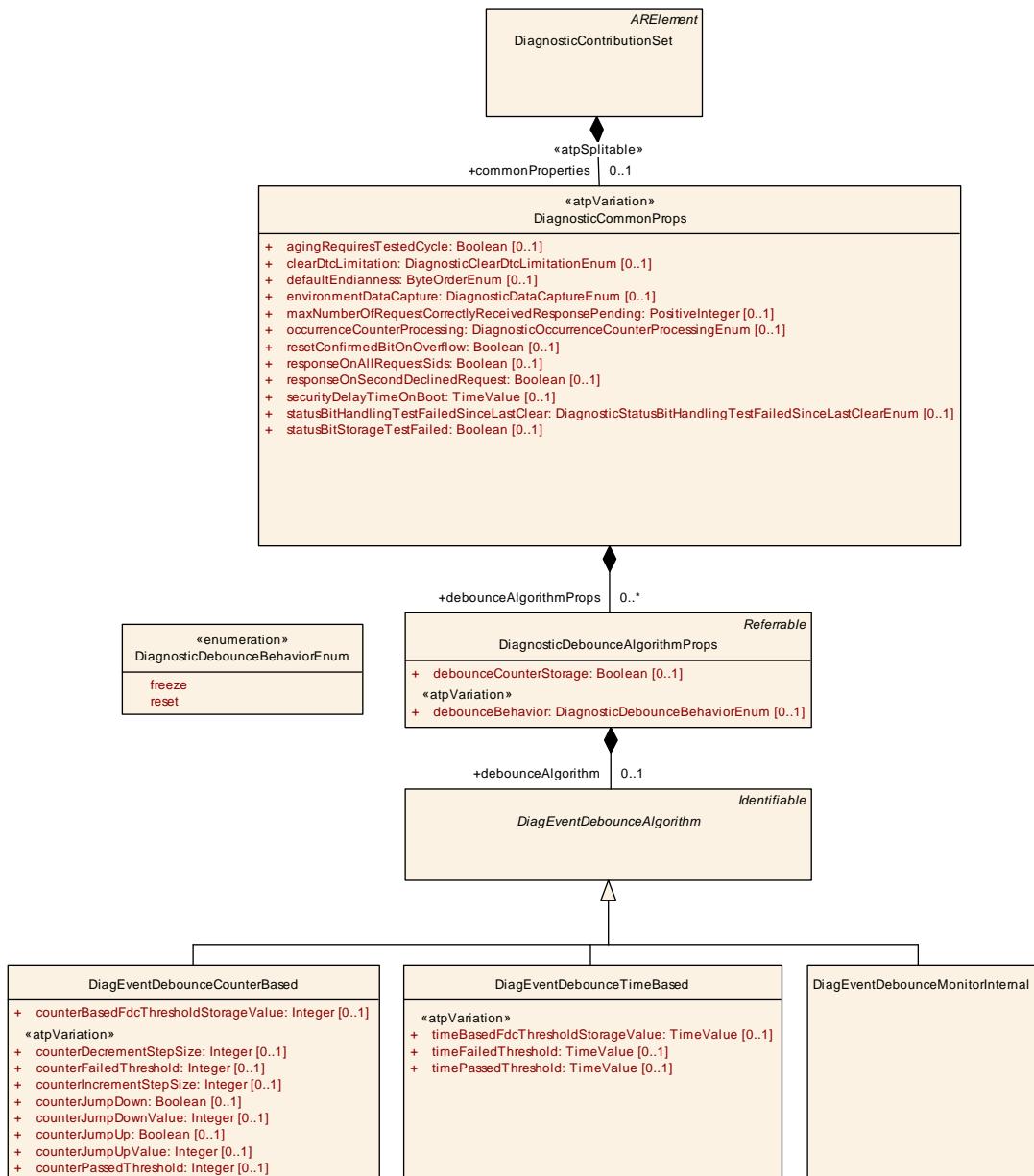


Figure 6.11: Details of `DiagnosticDebounceAlgorithmProps`

In other words, the debouncing of diagnostic events can be formulated in three different ways:

- The **DiagEventDebounceCounterBased** represents the ability to implement a counter-based debouncing.
- The **DiagEventDebounceTimeBased** represents the ability to implement a time-based debouncing.
- The **DiagEventDebounceMonitorInternal** represents the ability to implement the debouncing inside the implementation of the diagnostic monitor itself.

[constr_1359] Condition for the existence of attribute `DiagnosticDebounceAlgorithmProps.debounceCounterStorage` [Attribute `debounceCounterStorage` of meta-class `DiagnosticDebounceAlgorithmProps` shall only exist if the aggregation of attribute `debounceAlgorithm` at `DiagnosticDebounceAlgorithmProps` actually aggregates a `DiagEventDebounceCounterBased`]()

Class	<i>DiagEventDebounceAlgorithm</i> (abstract)			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	<p>This class represents the ability to specify the pre-debounce algorithm which is selected and/or required by the particular monitor.</p> <p>This class inherits from Identifiable in order to allow further documentation of the expected or implemented debouncing and to use the category for the identification of the expected / implemented debouncing.</p>			
Base	<i>ARObject, Identifiable, MultilanguageReferrable, Referrable</i>			
Subclasses	<i>DiagEventDebounceCounterBased, DiagEventDebounceMonitorInternal, DiagEventDebounceTime Based</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.33: DiagEventDebounceAlgorithm

Class	<i>DiagEventDebounceCounterBased</i>			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	<p>This meta-class represents the ability to indicate that the counter-based debounce algorithm shall be used by the DEM for this diagnostic monitor.</p> <p>This is related to set the ECUC choice container DemDebounceAlgorithmClass to DemDebounce CounterBased.</p>			
Base	<i>ARObject, DiagEventDebounceAlgorithm, Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
counterBased FdCThreshold StorageValue	Integer	0..1	attr	Threshold to allocate an event memory entry and to capture the Freeze Frame.
counter DecrementStep Size	Integer	0..1	attr	<p>This value shall be taken to decrement the internal debounce counter.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counterFailed Threshold	Integer	0..1	attr	<p>This value defines the event-specific limit that indicates the "failed" counter status.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counter IncrementStep Size	Integer	0..1	attr	<p>This value shall be taken to increment the internal debounce counter.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counterJump Down	Boolean	0..1	attr	<p>This value activates or deactivates the counter jump-down behavior.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>





Class	DiagEventDebounceCounterBased			
counterJumpDownValue	Integer	0..1	attr	<p>This value represents the initial value of the internal debounce counter if the counting direction changes from incrementing to decrementing.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counterJumpUp	Boolean	0..1	attr	<p>This value activates or deactivates the counter jump-up behavior.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counterJumpUpValue	Integer	0..1	attr	<p>This value represents the initial value of the internal debounce counter if the counting direction changes from decrementing to incrementing.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
counterPassedThreshold	Integer	0..1	attr	<p>This value defines the event-specific limit that indicates the "passed" counter status.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>

Table 6.34: DiagEventDebounceCounterBased

[constr_1835] Existence of DiagEventDebounceCounterBased.counterDecrementStepSize [For each DiagEventDebounceCounterBased, attribute counterDecrementStepSize shall exist **at the time when the DEXT is complete.**]()

[constr_1836] Existence of DiagEventDebounceCounterBased.counterIncrementStepSize [For each DiagEventDebounceCounterBased, attribute counterIncrementStepSize shall exist **at the time when the DEXT is complete.**]()

[constr_1837] Existence of DiagEventDebounceCounterBased.counterFailedThreshold [For each DiagEventDebounceCounterBased, attribute counterFailedThreshold shall exist **at the time when the DEXT is complete.**]()

[constr_1838] Existence of DiagEventDebounceCounterBased.counterPassedThreshold [For each DiagEventDebounceCounterBased, attribute counterPassedThreshold shall exist **at the time when the DEXT is complete.**]()

[constr_1766] Existence of DiagEventDebounceCounterBased.counterJumpDownValue [For each DiagEventDebounceCounterBased, attribute counterJumpDownValue shall only exist **at the time when the DEXT is complete** if attribute counterJumpDown exists and is set to True.]()

[constr_1767] Existence of DiagEventDebounceCounterBased.counterJumpUpValue [For each DiagEventDebounceCounterBased, attribute counterJumpUpValue shall only exist **at the time when the DEXT is complete** if attribute counterJumpUp exists and is set to True.]()

Class	DiagEventDebounceTimeBased			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	<p>This meta-class represents the ability to indicate that the time-based pre-debounce algorithm shall be used by the Dem for this diagnostic monitor.</p> <p>This is related to set the EcuC choice container DemDebounceAlgorithmClass to DemDebounceTime Base.</p>			
Base	ARObject, <i>DiagEventDebounceAlgorithm</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
timeBasedFdcThresholdStorageValue	TimeValue	0..1	attr	<p>Threshold to allocate an event memory entry and to capture the Freeze Frame.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
timeFailedThreshold	TimeValue	0..1	attr	<p>This value represents the event-specific delay indicating the "failed" status.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>
timePassedThreshold	TimeValue	0..1	attr	<p>This value represents the event-specific delay indicating the "passed" status.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>

Table 6.35: DiagEventDebounceTimeBased

[constr_1839] Existence of attribute *DiagEventDebounceTimeBased.timeFailedThreshold* [For each *DiagEventDebounceTimeBased*, attribute *timeFailedThreshold* shall exist **at the time when the DEXT is complete.**] ()

[constr_1840] Existence of attribute *DiagEventDebounceTimeBased.timePassedThreshold* [For each *DiagEventDebounceTimeBased*, attribute *timePassedThreshold* shall exist **at the time when the DEXT is complete.**] ()

Class	DiagEventDebounceMonitorInternal			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	<p>"This meta-class represents the ability to indicate that no Dem pre-debounce algorithm shall be used for this diagnostic monitor. The SWC might implement an internal debouncing algorithm and report qualified (debounced) results to the Dem/DM.</p>			
Base	ARObject, <i>DiagEventDebounceAlgorithm</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.36: DiagEventDebounceMonitorInternal

Enumeration	DiagnosticDebounceBehaviorEnum			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm			
Note	Event debounce algorithm behavior options.			
Literal	Description			





Enumeration	DiagnosticDebounceBehaviorEnum
freeze	The event debounce counter will be frozen with the current value and will not change while a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. After all related enable conditions are fulfilled and ControlDTCSetting of the related event is enabled again, the event qualification will continue with the next report of the event (i.e. SetEventStatus). Tags: atp.EnumerationLiteralIndex=0
reset	The event debounce counter will be reset to initial value if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. The qualification of the event will be restarted with the next valid event report. Tags: atp.EnumerationLiteralIndex=1

Table 6.37: DiagnosticDebounceBehaviorEnum

6.8 DiagnosticConditionGroup

[TPS_DEXT_01084] Semantics of **DiagnosticConditionGroups** [DiagnosticConditionGroups are used to collect DiagnosticConditions that in turn are assigned to DiagnosticEvents.] (RS_DEXT_00023, RS_DEXT_00028, RS_DEXT_00029)

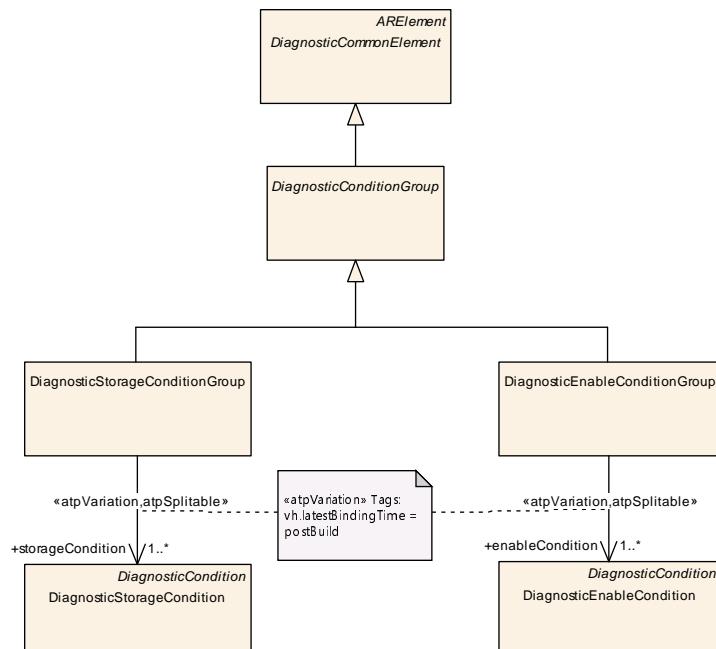


Figure 6.12: Modeling of DiagnosticConditionGroup

Class	DiagnosticConditionGroup (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticConditionGroup			
Note	Abstract element for StorageConditionGroups and EnableConditionGroups.			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	DiagnosticEnableConditionGroup, DiagnosticStorageConditionGroup			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.38: DiagnosticConditionGroup

Class	DiagnosticEnableConditionGroup			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticConditionGroup			
Note	Enable condition group which includes one or several enable conditions. Tags: atp.recommendedPackage=DiagnosticConditions			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticConditionGroup, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
enableCondition	DiagnosticEnableCondition	1..*	ref	Reference to enableConditions that are part of the Enable ConditionGroup. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=enableCondition.diagnosticEnableCondition, enableCondition.variationPoint.shortLabel vh.latestBindingTime=postBuild

Table 6.39: DiagnosticEnableConditionGroup

[constr_1841] Existence of *DiagnosticEnableConditionGroup.enableCondition* [For each *DiagnosticEnableConditionGroup*, attribute *enableCondition* shall exist at the time when the DEXT is complete.]()

Class	DiagnosticStorageConditionGroup			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticConditionGroup			
Note	Storage condition group which includes one or several storage conditions. Tags: atp.recommendedPackage=DiagnosticConditions			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticConditionGroup, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
storageCondition	DiagnosticStorageCondition	1..*	ref	Reference to storageConditions that are part of the StorageConditionGroup. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=storageCondition.diagnosticStorageCondition, storageCondition.variationPoint.shortLabel vh.latestBindingTime=postBuild

Table 6.40: DiagnosticStorageConditionGroup

[constr_1842] Existence of *DiagnosticStorageConditionGroup.storageCondition* [For each *DiagnosticStorageConditionGroup*, attribute *storageCondition* shall exist at the time when the DEXT is complete.]()

6.9 DiagnosticMapping

The mapping concept of the [DiagnosticExtract](#) template has been designed to support the decentralized and independent definition of diagnostic requirements that can be linked together at a late point during the development process.

It also supports the use of mapping contributions collected from various sources in order to reduce manual mapping work by the ECU integrator.

[TPS_DEXT_03002] Two kind of mappings [For diagnostic event handling, there are two kinds of mappings:

- Mapping between a [DiagnosticEvent](#) and another diagnostic definition.
- Mapping between a [DiagnosticEvent](#) and a SWC service port.

] ([RS_DEXT_00023](#), [RS_DEXT_00052](#))

Figure 6.13 gives an overview on the different types of mappings available for diagnostic event handling.

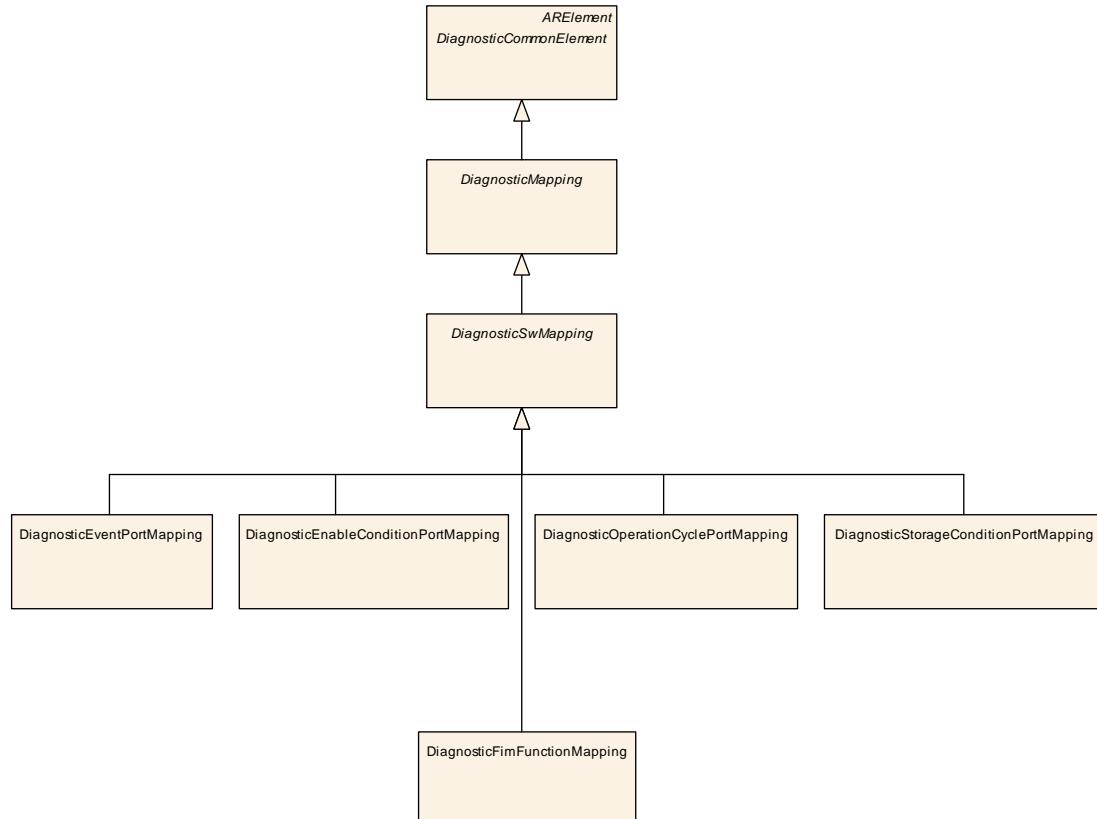


Figure 6.13: Modeling of DiagnosticMapping

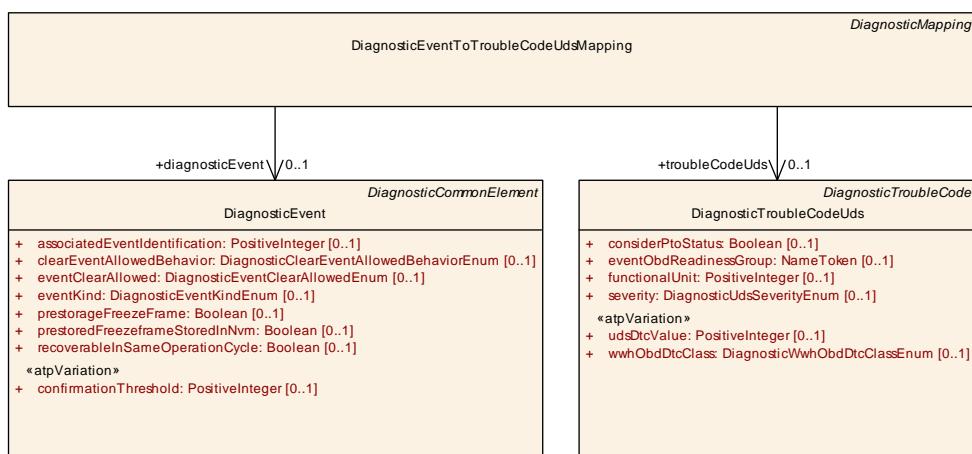
Class	DiagnosticMapping (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Abstract element for different kinds of diagnostic mappings.			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	DiagnosticDemProvidedDataMapping, DiagnosticEventToDebounceAlgorithmMapping, DiagnosticEventToEnableConditionGroupMapping, DiagnosticEventToOperationCycleMapping, DiagnosticEventToSecurityEventMapping, DiagnosticEventToStorageConditionGroupMapping, DiagnosticEventToTroubleCodeJ1939Mapping, DiagnosticEventToTroubleCodeUdsMapping, DiagnosticFimAliasEventGroupMapping, DiagnosticFimAliasEventMapping, DiagnosticInhibitSourceEventMapping, DiagnosticJ1939SpnMapping, DiagnosticSecurityEventReportingModeMapping, DiagnosticServiceDataMapping, DiagnosticSwMapping, DiagnosticTroubleCodeUdsToTroubleCodeObdMapping			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 6.41: DiagnosticMapping

6.9.1 DiagnosticEvent to DtcUds Mapping

[TPS_DEXT_03003] Semantics of DiagnosticEventToTroubleCodeUdsMapping [The **DiagnosticEventToTroubleCodeUdsMapping** is used to assign one (1:1) or multiple (n:1) **DiagnosticEvents** to a **DiagnosticTroubleCodeUds**.

In case of n:1, multiple instances of **DiagnosticEventToTroubleCodeUdsMapping** with the same reference of role **troubleCodeUds** but different references of role **diagnosticEvent** have to be defined.] (**RS_DEXT_00023**, **RS_DEXT_00024**, **RS_DEXT_00025**)


Figure 6.14: DiagnosticEventToDtcUdsMapping

Class	DiagnosticEventToTroubleCodeUdsMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines which UDS Diagnostic Trouble Code is applicable for a DiagnosticEvent. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	DiagnosticEvent	0..1	ref	Reference to a DiagnosticEvent to which a UDS Diagnostic Trouble Code is assigned.
troubleCodeUds	DiagnosticTroubleCode Uds	0..1	ref	Reference to an UDS Diagnostic Trouble Code assigned to a DiagnosticEvent.

Table 6.42: DiagnosticEventToTroubleCodeUdsMapping

6.9.2 DiagnosticEvent to DiagnosticOperationCycle Mapping

[TPS_DEXT_01086] Reference to DiagnosticOperationCycle [A DiagnosticEvent needs to be assigned to exactly one DiagnosticOperationCycle.] (*RS_DEXT_00024, RS_DEXT_00054*)

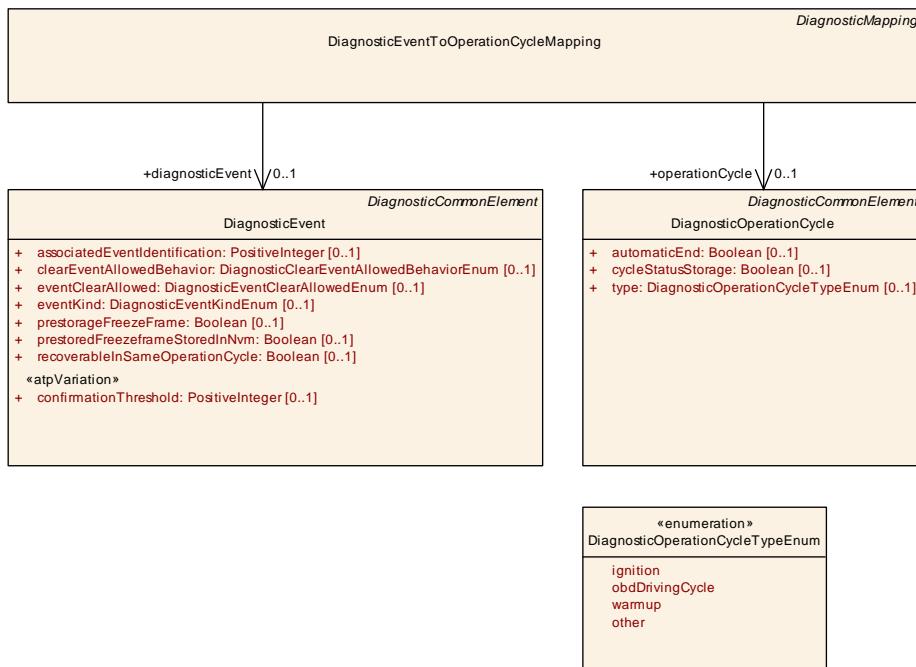


Figure 6.15: DiagnosticEventToOperationCycleMapping

Class	DiagnosticEventToOperationCycleMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines which OperationCycle is applicable for a DiagnosticEvent. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	DiagnosticEvent	0..1	ref	Reference to a DiagnosticEvent to which an Operation Cycle is assigned.
operationCycle	DiagnosticOperation Cycle	0..1	ref	Reference to an OperationCycle assigned to a Diagnostic Event.

Table 6.43: DiagnosticEventToOperationCycleMapping

6.9.3 DiagnosticEvent to DebounceAlgorithm Mapping

[TPS_DEXT_03004] DiagnosticEvent and DiagnosticDebounceAlgorithmProps [If a DiagnosticEvent has to be debounced, it must be mapped to the appropriate DiagnosticDebounceAlgorithmProps.] (*RS_DEXT_00023, RS_DEXT_00053*)

[TPS_DEXT_03005] Existence of DiagnosticEventToDebounceAlgorithmMapping [The DiagnosticEventToDebounceAlgorithmMapping shall not be created if the DiagnosticEvent is not debounced.] (*RS_DEXT_00023, RS_DEXT_00053*)

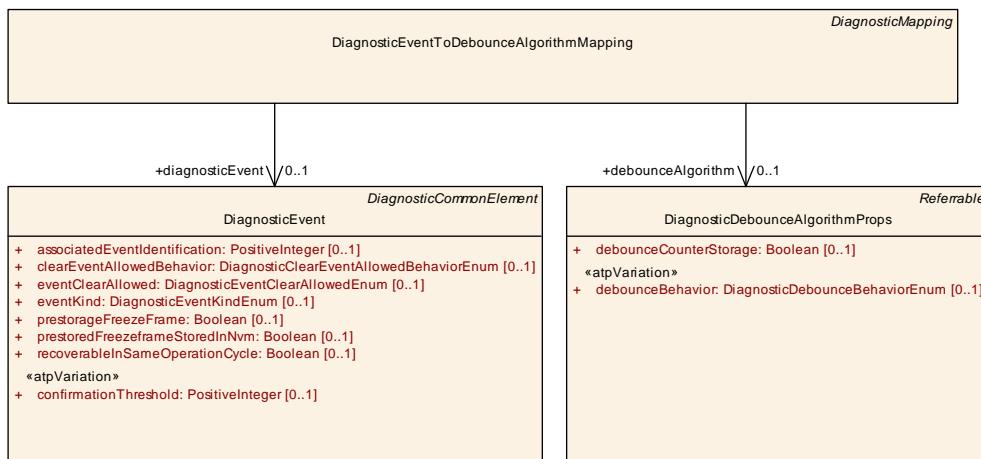


Figure 6.16: DiagnosticEventToDebounceAlgorithmMapping

Class	DiagnosticEventToDebounceAlgorithmMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines which Debounce Algorithm is applicable for a DiagnosticEvent. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
debounce Algorithm	DiagnosticDebounce AlgorithmProps	0..1	ref	Reference to a DebounceAlgorithm assigned to a DiagnosticEvent.
diagnosticEvent	DiagnosticEvent	0..1	ref	Reference to a DiagnosticEvent to which a Debounce Algorithm is assigned.

Table 6.44: DiagnosticEventToDebounceAlgorithmMapping

Class	DiagnosticDebounceAlgorithmProps			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm			
Note	Defines properties for the debounce algorithm class.			
Base	<i>ARObject, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
debounce Algorithm	DiagEventDebounce Algorithm	0..1	aggr	This represents the actual debounce algorithm.
debounce Behavior	DiagnosticDebounce BehaviorEnum	0..1	attr	This attribute defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
debounce CounterStorage	Boolean	0..1	attr	Switch to store the debounce counter value non-volatile or not. true: debounce counter value shall be stored non-volatile false: debounce counter value is volatile

Table 6.45: DiagnosticDebounceAlgorithmProps

The details regarding the formalization of debouncing behavior are depicted in Figure 6.11.

In particular, *DiagnosticCommonProps* aggregates *DiagnosticDebounceAlgorithmProps* in the role *debounceAlgorithmProps*. The *DiagnosticDebounceAlgorithmProps* itself does not actually represent the debouncing algorithm but provides attributes relevant for the actual debouncing algorithm.

6.9.4 DiagnosticEvent to EnableConditionGroup Mapping

[TPS_DEXT_03015] EnableConditions have to be put into a DiagnosticEnableConditionGroup [EnableConditions that are assigned to a DiagnosticEvent have to be put into a DiagnosticEnableConditionGroup since only a group of EnableConditions can be mapped to a DiagnosticEvent.] (*RS_DEXT_00023, RS_DEXT_00026, RS_DEXT_00028*)

[constr_1361] Number of `DiagnosticEventToEnableConditionGroupMapping` elements per `DiagnosticEvent` [The mapping element `DiagnosticEventToEnableConditionGroupMapping` shall be created no more than once per `DiagnosticEvent`.]

If several `DiagnosticEventToEnableConditionGroupMapping` elements referring to the same `DiagnosticEvent` are defined, then the Enable Condition Group mapping shall be regarded as defective.]()

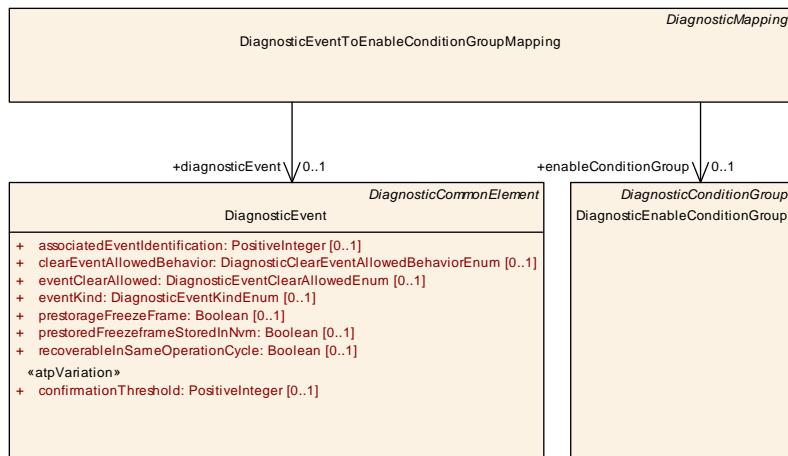


Figure 6.17: `DiagnosticEventToEnableConditionGroupMapping`

Class	<code>DiagnosticEventToEnableConditionGroupMapping</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines which EnableConditionGroup is applicable for a DiagnosticEvent. Tags:atp.recommendedPackage=DiagnosticMappings			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticMapping</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<code>DiagnosticEvent</code>	0..1	ref	Reference to a DiagnosticEvent to which an Enable ConditionGroup is assigned.
enableCondition Group	<code>DiagnosticEnable ConditionGroup</code>	0..1	ref	Reference to an EnableConditionGroup assigned to a DiagnosticEvent.

Table 6.46: `DiagnosticEventToEnableConditionGroupMapping`

6.9.5 DiagnosticEvent to StorageConditionGroup Mapping

[TPS_DEXT_03016] StorageConditions have to be put into a `DiagnosticStorageConditionGroup` [StorageConditions that are assigned to a `DiagnosticEvent` have to be put into a `DiagnosticStorageConditionGroup` since only a group of StorageConditions can be mapped to a `DiagnosticEvent`.] (*RS_DEXT_00023, RS_DEXT_00027, RS_DEXT_00029*)

[constr_1362] Number of `DiagnosticEventToStorageConditionGroupMapping` elements per `DiagnosticEvent` [The mapping element `DiagnosticEventToStorageConditionGroupMapping` shall be created no more than once or once per `DiagnosticEvent`.]

If several `DiagnosticEventToStorageConditionGroupMapping` elements referring to the same `DiagnosticEvent` are defined, then the Storage Condition Group mapping shall be regarded as defective.] ()

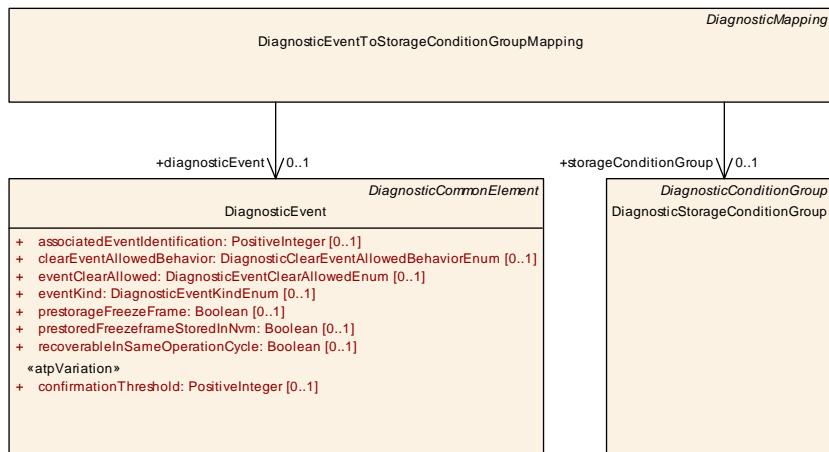


Figure 6.18: `DiagnosticEventToStorageConditionGroupMapping`

[TPS_DEXT_03006] Values of the individual `DiagnosticStorageConditions` [The values of the individual `DiagnosticStorageConditions` need to be algorithmically evaluated in order to find out whether or not the storage of the `DiagnosticEvent` is permitted.]

The algorithm that is supposed to be implemented for this purpose is documented in [SWS_Dem_00459].] ([RS_DEXT_00027](#))

Class	<code>DiagnosticEventToStorageConditionGroupMapping</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines which StorageConditionGroup is applicable for a DiagnosticEvent. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticMapping</code> , <code>Identifiable</code> , <code>MultilanguageReferable</code> , <code>PackageableElement</code> , <code>Referable</code>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<code>DiagnosticEvent</code>	0..1	ref	Reference to a DiagnosticEvent to which a Storage ConditionGroup is assigned.
storage ConditionGroup	<code>DiagnosticStorage ConditionGroup</code>	0..1	ref	Reference to a StorageConditionGroup assigned to a DiagnosticEvent.

Table 6.47: `DiagnosticEventToStorageConditionGroupMapping`

6.9.6 DiagnosticEvent to Port Mapping

[TPS_DEXT_03007] Semantics of DiagnosticEventPortMapping [A DiagnosticEventPortMapping defines which SwcServiceDependency's of a Atomic-SwComponentType or BswServiceDependency of a BswModuleDescription have to be connected to which DiagnosticEvent.]

This is realized by defining a DiagnosticEventPortMapping referencing a DiagnosticEvent and (using <<instanceRef>>) an instance of SwcServiceDependency (or BswServiceDependency).] (RS_DEXT_00023, RS_DEXT_00052)

If such an instance is not yet available, an ordinary reference to SwcServiceDependency can be given alternatively (i.e. without specifying a certain instance).

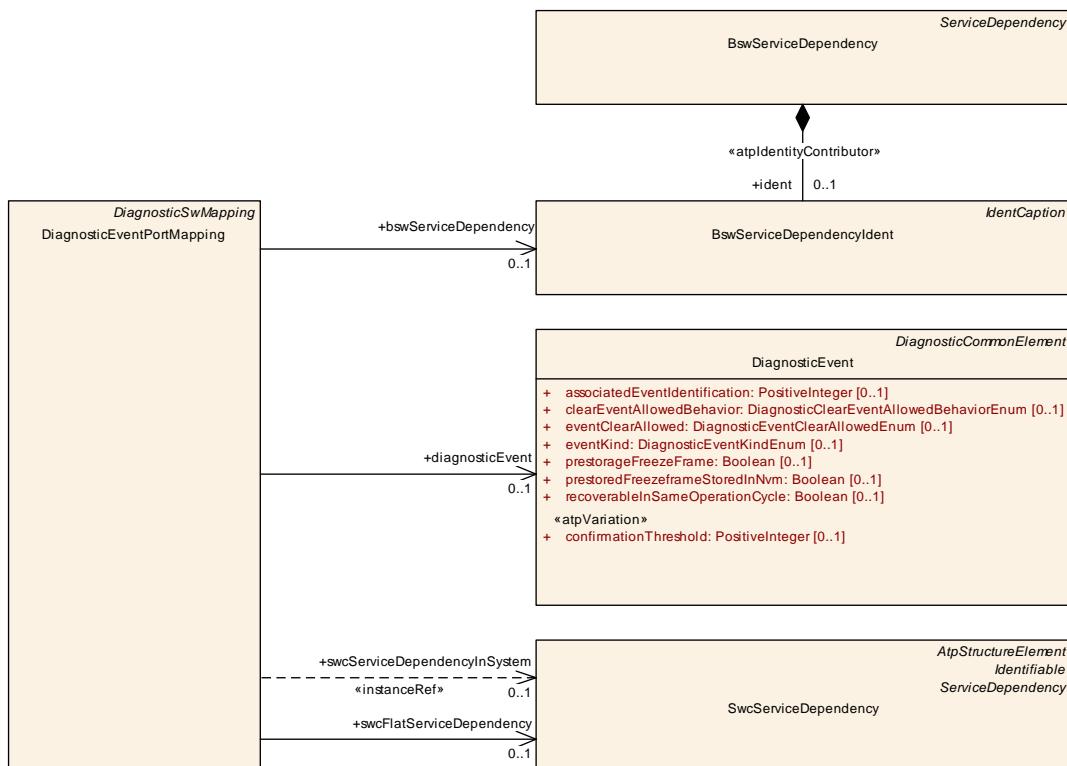


Figure 6.19: DiagnosticEventPortMapping

In this way, the ECU integrator is able to directly derive the actual mapping between SWC (or BSW) service ports and the ports of the Service Components during ECU configuration.

[constr_1435] Debouncing in the presence of a DiagnosticEventPortMapping [If a DiagnosticEventPortMapping exists and the enclosed DiagnosticEvent-PortMapping.diagnosticEvent is also referenced by a DiagnosticEvent-ToDebounceAlgorithmMapping then the concrete subclass of the respective DiagnosticEventToDebounceAlgorithmMapping.debounceAlgorithm.debounceAlgorithm shall be identical to the DiagnosticEventPortMapping.swcServiceDependencyInSystem/swcFlatServiceDependency.service-Needs.diagEventDebounceAlgorithm.]

It is assumed that the target of reference `DiagnosticEventPortMapping.swcServiceDependencyInSystem` resp. `swcFlatServiceDependency` aggregates a `DiagnosticEventNeeds.`]()

Class	DiagnosticEventPortMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines to which SWC service ports with DiagnosticEventNeeds the DiagnosticEvent is mapped. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, DiagnosticSwMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
bswService Dependency	<code>BswService DependencyIdent</code>	0..1	ref	Reference to a BswServiceDependency that links Service Needs to BswModuleEntries.
diagnosticEvent	<code>DiagnosticEvent</code>	0..1	ref	Reference to the DiagnosticEvent that is assigned to SWC service ports with DiagnosticEventNeeds.
swcFlatService Dependency	<code>SwcService Dependency</code>	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports.
swcService DependencyIn System	<code>SwcService Dependency</code>	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. InstanceRef implemented by: <code>SwcServiceDependency InSystemInstanceRef</code>

Table 6.48: DiagnosticEventPortMapping

[constr_1843] Existence of reference `DiagnosticEventPortMapping.diagnosticEvent` [For each `DiagnosticEventPortMapping`, the reference to `DiagnosticEvent` in the role `diagnosticEvent` shall exist **at the time when the DEXT is complete.**]()

[constr_1762] Existence of references owned by `DiagnosticEventPortMapping` [For each `DiagnosticEventPortMapping`, only one of the references

- to `BswServiceDependency` in the role `bswServiceDependency`
- to `SwcServiceDependency` in the role `swcFlatServiceDependency`
- to `SwcServiceDependency` in the role `swcServiceDependencyInSystem`

shall exist **at the time when the DEXT is complete.**]()

6.9.7 DiagnosticOperationCycle to Port Mapping

[TPS_DEXT_03017] Semantics of `DiagnosticOperationCyclePortMapping` [A `DiagnosticOperationCyclePortMapping` defines which SWC service port(s) have to be connected to which `DiagnosticOperationCycle`.

This is realized by defining a `DiagnosticOperationCyclePortMapping` referencing a `DiagnosticOperationCycle` and an instance of `SwcServiceDependency`.] (*RS_DEXT_00052, RS_DEXT_00053*)

If such an instance is not yet available, an ordinary reference to [SwcServiceDependency](#) can be given alternatively (i.e. without specifying a certain instance).

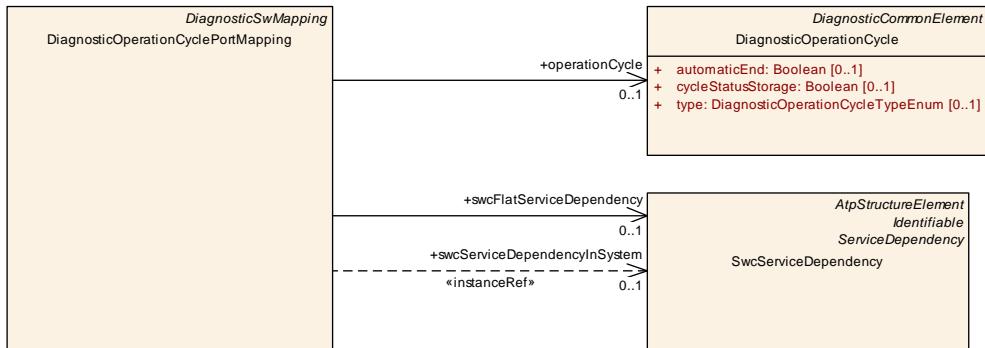


Figure 6.20: DiagnosticOperationCyclePortMapping

Class	DiagnosticOperationCyclePortMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines to which SWC service ports with DiagnosticOperationCycleNeeds the DiagnosticOperationCycle is mapped. Tags:atp.recommendedPackage=DiagnosticMappings			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticMapping , DiagnosticSwMapping , Identifiable , MultilanguageReferable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
operationCycle	DiagnosticOperationCycle	0..1	ref	Reference to the DiagnosticOperationCycle that is assigned to SWC service ports with DiagnosticOperationCycleNeeds.
swcFlatServiceDependency	SwcServiceDependency	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports.
swcServiceDependencyInSystem	SwcServiceDependency	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. InstanceRef implemented by:SwcServiceDependencyInSystemInstanceRef

Table 6.49: DiagnosticOperationCyclePortMapping

[constr_1844] Existence of reference [DiagnosticOperationCyclePortMapping.operationCycle](#) [For each [DiagnosticOperationCyclePortMapping](#), the reference to [DiagnosticOperationCycle](#) in the role [operationCycle](#) shall exist **at the time when the DEXT is complete.**.]()

[constr_1759] Existence of references owned by [DiagnosticOperationCyclePortMapping](#) [For each [DiagnosticOperationCyclePortMapping](#), only one of the following references

- to [SwcServiceDependency](#) in the role [swcFlatServiceDependency](#)
- to [SwcServiceDependency](#) in the role [swcServiceDependencyInSystem](#)

shall exist **at the time when the DEXT is complete.**.]()

6.9.8 DiagnosticEnableCondition to Port Mapping

[TPS_DEXT_03018] Semantics of [DiagnosticEnableConditionPortMapping](#)

「A [DiagnosticEnableConditionPortMapping](#) defines which SWC service port(s) have to be connected to which [DiagnosticEnableCondition](#). This is realized by defining a [DiagnosticEnableConditionPortMapping](#) referencing a [DiagnosticEnableCondition](#) and an instance of [SwcServiceDependency](#).」(*RS_DEXT_00026, RS_DEXT_00052*)

If such an instance is not yet available, an ordinary reference to [SwcServiceDependency](#) can be given alternatively (i.e. without specifying a certain instance).



Figure 6.21: [DiagnosticEnableConditionPortMapping](#)

[constr_1752] Existence of references owned by [DiagnosticEnableConditionPortMapping](#) 「For each [DiagnosticEnableConditionPortMapping](#), only one of the following references

- to [SwcServiceDependency](#) in the role [swcFlatServiceDependency](#)
- to [SwcServiceDependency](#) in the role [swcServiceDependencyInSystem](#)

may exist at the time when the DEXT is complete.」()

Class	DiagnosticEnableConditionPortMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines to which SWC service ports with DiagnosticEnableConditionNeeds the DiagnosticEnableCondition is mapped. Tags:atp.recommendedPackage=DiagnosticMappings			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticMapping , DiagnosticSwMapping , Identifiable , MultilanguageReferrable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
enableCondition	DiagnosticEnableCondition	0..1	ref	Reference to the EnableCondition which is mapped to a SWC service port with DiagnosticEnableConditionNeeds .





Class	DiagnosticEnableConditionPortMapping			
swcFlatService Dependency	SwcService Dependency	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports. This reference can be used in early stages of the development in order to identify the SwcServiceDependency without a full System Context.
swcService DependencyIn System	SwcService Dependency	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. InstanceRef implemented by:SwcServiceDependency InSystemInstanceRef

Table 6.50: DiagnosticEnableConditionPortMapping

[constr_1845] Existence of reference DiagnosticEnableConditionPortMapping.enableCondition [For each DiagnosticEnableConditionPortMapping, the reference to DiagnosticEnableCondition in the role enableCondition shall exist at the time when the DEXT is complete.]()

6.9.9 DiagnosticStorageCondition to Port Mapping

[TPS_DEXT_03019] Semantics of DiagnosticStorageConditionPortMapping [A DiagnosticStorageConditionPortMapping defines which SWC service port(s) have to be connected to which DiagnosticStorageCondition. This is realized by defining a DiagnosticStorageConditionPortMapping referencing a DiagnosticStorageCondition and an instance of SwcServiceDependency.] (*RS_DEXT_00027, RS_DEXT_00052*)

If such an instance is not yet available, an ordinary reference to SwcServiceDependency can be given alternatively (i.e. without specifying a certain instance).

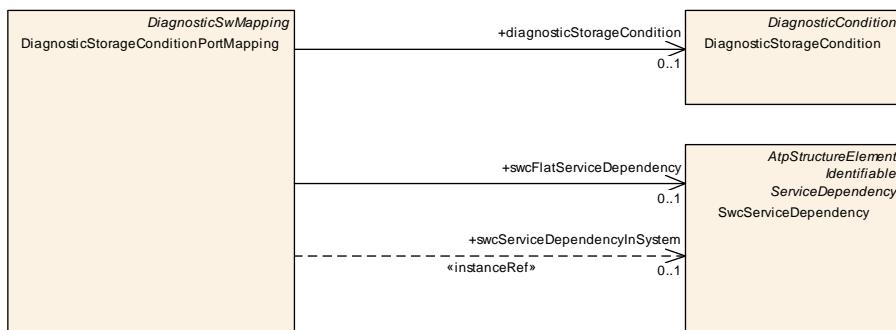


Figure 6.22: DiagnosticStorageConditionPortMapping

[constr_1753] Existence of references owned by DiagnosticStorageConditionPortMapping [For each DiagnosticStorageConditionPortMapping, only one of the following references

- to SwcServiceDependency in the role swcFlatServiceDependency
- to SwcServiceDependency in the role swcServiceDependencyInSystem

may exist at the time when the DEXT is complete.]()

Class	DiagnosticStorageConditionPortMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	Defines to which SWC service ports with DiagnosticStorageConditionNeeds the DiagnosticStorage Condition is mapped. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, DiagnosticSwMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnostic Storage Condition	DiagnosticStorage Condition	0..1	ref	Reference to the StorageCondition which is mapped to a SWC service port with DiagnosticStorageCondition Needs.
swcFlatService Dependency	SwcService Dependency	0..1	ref	Reference to a SwcServiceDependencyType that links ServiceNeeds to SWC service ports.
swcService DependencyIn System	SwcService Dependency	0..1	iref	Instance reference to a SwcServiceDependency that links ServiceNeeds to SWC service ports. InstanceRef implemented by: SwcServiceDependency InSystemInstanceRef

Table 6.51: DiagnosticStorageConditionPortMapping

[constr_1846] Existence of reference **DiagnosticStorageConditionPortMapping.diagnosticStorageCondition** [For each **DiagnosticStorageConditionPortMapping**, the reference to **DiagnosticStorageCondition** in the role **diagnosticStorageCondition** shall exist at the time when the DEXT is complete.]()

6.9.10 Provided Data Mapping

[TPS_DEXT_03020] Semantics of **DiagnosticDemProvidedDataMapping** [The meta-class **DiagnosticDemProvidedDataMapping** does not seem to fulfill the condition for representing a mapping class because it only has one reference to a **DiagnosticDataElement** in the role **dataElement**.]

However, the specific nature of this mapping is that the second element (the **DiagnosticDemProvidedDataMapping.dataProvider**) that is supposed to take place in the mapping cannot precisely be modeled as a single meta-class.

Therefore, there is no better way than to model the **DiagnosticDemProvidedDataMapping.dataProvider** by a **NameToken**.

The semantics of this mapping is to further qualify the access to the **DiagnosticDataElement** referenced in the role **dataElement** from within the Dem.](*RS_DEXT_00043, RS_DEXT_00052*)

[TPS_DEXT_01142] Standardized values for **DiagnosticDemProvidedDataMapping.dataProvider** [For attribute **DiagnosticDemProvidedDataMapping.dataProvider**, the following values are reserved by the AUTOSAR standard:

- DEM_AGINGCTR_DOWNCNT: map down-counting Dem-internal aging counter.

- DEM_AGINGCTR_UPCNT: map up-counting Dem-internal aging counter.
- DEM_AGINGCTR_UPCNT_FIRST_ACTIVE: Map up-counting Dem-internal aging counter, starting at 1 when aging starts.
- DEM_CLR_DIST: Distance since diagnostic trouble codes cleared.
- DEM_CLR_TIME: Time since diagnostic trouble codes cleared
- DEM_CURRENT_FDC: map Dem-internal fault detection counter.
- DEM_CYCLES_SINCE_FIRST_FAILED: map Dem-internal Operation Cycle Counter - cycles since first failed.
- DEM_CYCLES_SINCE_LAST_FAILED: map Dem-internal Operation Cycle Counter - cycles since last failed.
- DEM_DTC_PRIORITY: DTC priority statically assigned to this DTC.
- DEM_FAILED_CYCLES: map Dem-internal Operation Cycle Counter - failed cycles.
- DEM_MAX_FDC_DURING_CURRENT_CYCLE: map Dem-internal DTC Fault Detection Counter maximum value during current operation cycle.
- DEM_MAX_FDC_SINCE_LAST_CLEAR: map Dem-internal DTC Fault Detection Counter maximum value since last clear.
- DEM_MIL_DIST: Distance traveled While MIL is activated.
- DEM_MIL_TIME: Time run by the engine while MIL is activated.
- DEM_OCCCTR: map Dem-internal occurrence counter.
- DEM_OVFLIND: map Dem-internal overflow indication.
- DEM_SIGNIFICANCE: map (static) Dem-internal event significance.
- DEM_WARM_UPS: Number of warm-ups since diagnostic trouble codes cleared.
- DEM_J1939LAMP_STATUS: Current state of applicable lamp(s) for this DTC in SAE J1939 DM31 format.
- DEM_EVENT_ASSOCIATED_IDENTIFICATION: static event identification value associated to an event, see [[TPS_DEXT_01151](#)].

]([RS_DEXT_00043](#), [RS_DEXT_00052](#))

Please note that, where applicable, AUTOSAR allows for the usage of values of the attribute `DiagnosticDemProvidedDataMapping.dataProvider` other than the values standardized by [[TPS_DEXT_01142](#)].

In this case, however, proprietary values of the attribute `DiagnosticDemProvidedDataMapping.dataProvider` shall be prefixed with a company-specific name fragment in order to avoid collisions that could occur if or when the list of possible values claimed by the AUTOSAR standard itself is extended.

[constr_1782] Usage of internal data elements only for extended data records

[A `DiagnosticDemProvidedDataMapping` shall **only** refer to a `DiagnosticDataElement` that is aggregated by a `DiagnosticExtendedDataRecord` in the role `recordElement.dataElement`.]()

Please note the existence of [constr_1756].

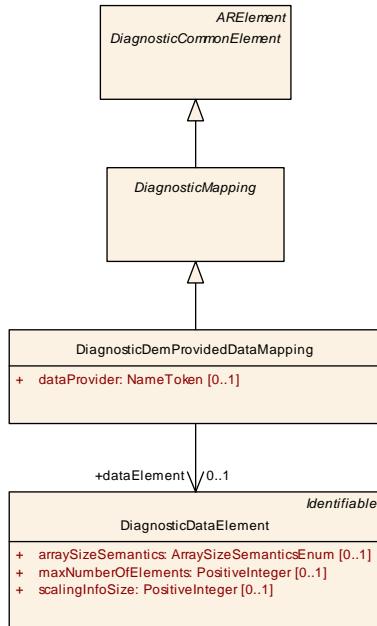


Figure 6.23: Modeling of the `DiagnosticDemProvidedDataMapping`

Class	<code>DiagnosticDemProvidedDataMapping</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping			
Note	This represents the ability to define the nature of a data access for a <code>DiagnosticDataElement</code> in the Dem. Tags: atp.recommendedPackage=DiagnosticServiceMappings			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticMapping</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
dataElement	<code>DiagnosticDataElement</code>	0..1	ref	This represents the <code>DiagnosticDataElement</code> for which the access is further qualified by the <code>DiagnosticDemProvidedDataMapping</code> .
dataProvider	<code>NameToken</code>	0..1	attr	This represents the ability to further specify the access within the Dem.

Table 6.52: `DiagnosticDemProvidedDataMapping`

[constr_1847] Existence of reference `DiagnosticDemProvidedDataMapping.dataElement` [For each `DiagnosticDemProvidedDataMapping`, the reference to `DiagnosticDataElement` in the role `dataElement` shall exist **at the time when the DEXT is complete.**]()

6.9.11 Master to Slave Event Mapping

AUTOSAR provides the ability to associate multiple diagnostic events in the way that the reporting of one event (also known as the master event) from a diagnostic monitor automatically triggers the reporting of one or more other diagnostic events (also known as slave events) with the same test result.

Please note that the existence of the [DiagnosticMasterToSlaveEventMapping](#) is primarily motivated by the need to store the result of event reporting simultaneously in different fault memories within the affected ECU.

As a consequence, a model that references a given [DiagnosticEvent](#) as both [masterEvent](#) and [slaveEvent](#) shall be considered broken, as further clarified in [\[constr_1590\]](#).

In the same spirit, a model where one specific [DiagnosticEvent](#) is referenced more than once in the role [masterEvent](#) or the role [slaveEvent](#) is also considered broken.

[constr_1590] [DiagnosticEvent](#) referenced in the role [masterEvent](#) or [slaveEvent](#) [Any given [DiagnosticEvent](#) shall at most once be referenced from a [DiagnosticMasterToSlaveEventMapping](#).]()

A diagnostic slave event shall never be reported directly by a diagnostic monitor. Slave events are exclusively reported internally in the Dem. This important aspect is covered by [\[constr_1591\]](#).

[constr_1591] [DiagnosticEvent](#) referenced as [slaveEvent](#) shall not be reported by diagnostic monitor [A [DiagnosticEvent](#) referenced in the role [DiagnosticMasterToSlaveEventMapping.slaveEvent](#) shall not be referenced in the role [DiagnosticEventPortMapping.diagnosticEvent](#) and vice versa.]()

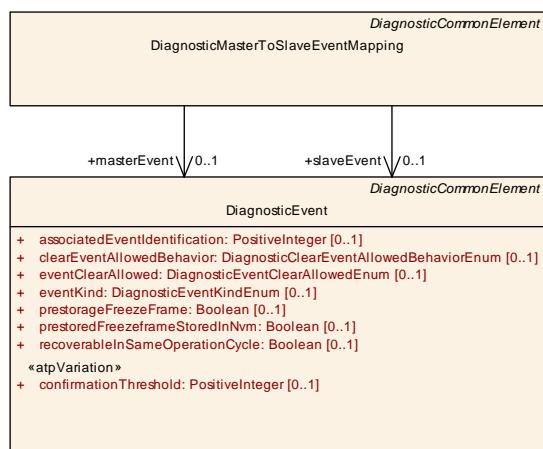


Figure 6.24: Modeling of the [DiagnosticMasterToSlaveEventMapping](#)

Class	DiagnosticMasterToSlaveEventMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	This meta-class provides the ability to map a master diagnostic event with a slave diagnostic event such that reporting of the master event with a given value also reports the slave event with the same value Tags: atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
masterEvent	DiagnosticEvent	0..1	ref	This represents the master diagnostic event.
slaveEvent	DiagnosticEvent	0..1	ref	This represents the slave diagnostic event.

Table 6.53: DiagnosticMasterToSlaveEventMapping

6.9.12 Diagnostic Event to Security Event Mapping

AUTOSAR provides the ability to define so-called security events (formalized by meta-class [SecurityEventDefinition](#)) to indicate a possible intrusion into an AUTOSAR system.

The details are described in the specification of the TPS Security Extract Template [20].

[TPS_DEXT_01153]{DRAFT} Semantics of meta-class [DiagnosticEventToSecurityEventMapping \[The occurrence of some security events need to be persisted in the context of the Dem.\]](#)

Technically, this mechanism boils down to a reporting of a diagnostic event in response to the occurrence of a security event.

This approach is made possible by the existence of the [DiagnosticEventToSecurityEventMapping](#).] ([RS_DEXT_00080](#))

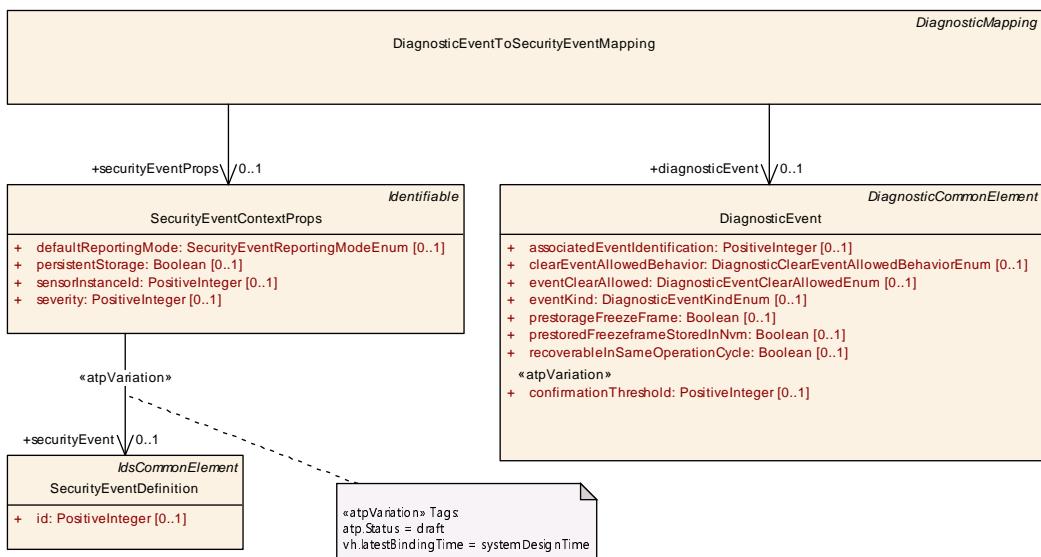


Figure 6.25: Modeling of the [DiagnosticEventToSecurityEventMapping](#)

Class	DiagnosticEventToSecurityEventMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticMapping			
Note	This meta-class represents the ability to map a security event that is defined in the context of the Security Extract to a diagnostic event defined on the context of the DiagnosticExtract. Tags: atp.Status=draft atp.recommendedPackage=DiagnosticMappings			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	DiagnosticEvent	0..1	ref	This reference identifies the applicable diagnostic event. Tags: atp.Status=draft
securityEventProps	SecurityEventContextProps	0..1	ref	This reference identifies the qualification of the applicable security event Tags: atp.Status=draft

Table 6.54: DiagnosticEventToSecurityEventMapping

[constr_10026]{DRAFT} Existence of reference in the role `DiagnosticEventToSecurityEventMapping.diagnosticEvent` [For each `DiagnosticEventToSecurityEventMapping`, the reference to `DiagnosticEvent` in the role `diagnosticEvent` shall exist **at the time when the DEXT is complete.**.]()

[constr_10027]{DRAFT} Existence of reference in the role `DiagnosticEventToSecurityEventMapping.securityEventProps` [For each `DiagnosticEventToSecurityEventMapping`, the reference to `SecurityEventContextProps` in the role `securityEventProps` shall exist **at the time when the DEXT is complete.**.]()

It is important to understand that the mapping to a security event is **not** directed at `SecurityEventDefinition`. This meta-class represents a high-level design object that needs some more context in order to be considered in a specific project.

This additional context is provided by `SecurityEventContextProps`, which consequentially becomes the target of the reference in the role `DiagnosticEventToSecurityEventMapping.securityEventProps`.

At first glance, it may seem that the definition of the `DiagnosticEventToSecurityEventMapping` and the existence of attribute `SecurityEventContextProps.persistentStorage` create a certain level of redundancy. However, this is not really the case.

This means in particular that the existence of `SecurityEventContextProps.persistentStorage` can be used to indicate the need to persist the respective security event.

The corresponding `DiagnosticEventToSecurityEventMapping` may be created later in the workflow where the formal information which security event shall be persisted represents an important input to the workflow.

Class	SecurityEventContextProps			
Package	M2::AUTOSARTemplates::SecurityExtractTemplate			
Note	This meta-class specifies the SecurityEventDefinition to be mapped to an IdsmlInstance and adds mapping-dependent properties of this security event valid only for this specific mapping. Tags: atp.Status=draft			
Base	ARObject, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
contextData	SecurityEventContext Data	0..1	aggr	<p>This aggregation represents the definition of optional context data for security events.</p> <p>Stereotypes: atpVariation Tags: atp.Status=draft vh.latestBindingTime=systemDesignTime</p>
default ReportingMode	SecurityEventReporting ModeEnum	0..1	attr	This attribute defines the default reporting mode for the referenced security event.
persistent Storage	Boolean	0..1	attr	This attribute controls whether qualified reportings of the referenced security event shall be stored persistently by the mapped IdsmlInstance or not.
securityEvent	SecurityEventDefinition	0..1	ref	<p>This reference defines the security event that is mapped and enriched by SecurityEventMappingProps with mapping dependent properties.</p> <p>Stereotypes: atpVariation Tags: atp.Status=draft vh.latestBindingTime=systemDesignTime</p>
sensorInstanceId	PositiveInteger	0..1	attr	This attribute defines the ID of the security sensor that detects the referenced security event.
severity	PositiveInteger	0..1	attr	This attribute defines how critical/severe the referenced security event is. Please note that currently, the severity level meanings of specific integer values is not specified by AUTOSAR but left to the party responsible for the IDS system design (e.g. the OEM).

Table 6.55: SecurityEventContextProps

Class	SecurityEventDefinition			
Package	M2::AUTOSARTemplates::SecurityExtractTemplate			
Note	This meta-class defines a security-related event as part of the intrusion detection system. Tags: atp.Status=draft atp.recommendedPackage=SecurityEventDefinitions			
Base	<i>ARElement</i> , ARObject, CollectableElement, <i>Identifiable</i> , IdsCommonElement, <i>MultilanguageReferrable</i> , PackageableElement, <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
eventSymbolName	SymbolProps	0..1	aggr	<p>This aggregation defines optionally an alternative Event Name for the SecurityEventDefinition in case there is a collision of shortNames.</p> <p>Stereotypes: atpSplittable Tags: atp.Splitkey=eventSymbolName.shortName atp.Status=draft</p>

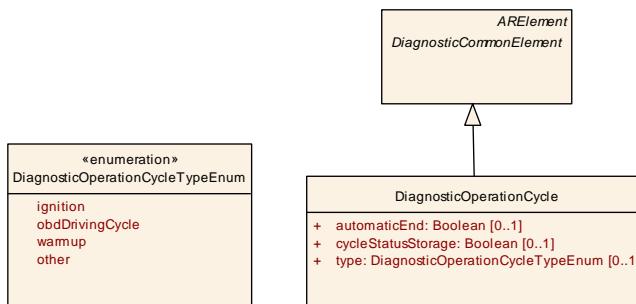


Class	SecurityEventDefinition			
id	PositiveInteger	0..1	attr	<p>This attribute represents the numerical identification of the defined security event. The identification shall be unique within the scope of the IDS.</p> <p>Tags:atp.Status=draft</p>

Table 6.56: SecurityEventDefinition

6.10 DiagnosticOperationCycle

[TPS_DEXT_01087] **Semantics of DiagnosticOperationCycle** [Different types of DiagnosticOperationCycles are supported and defined by the `type` attribute, e.g. the time between ignition on and ignition off.] (RS_DEXT_00054)


Figure 6.26: Modeling of DiagnosticOperationCycle

Class	DiagnosticOperationCycle			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticOperationCycle			
Note	Definition of an operation cycle that is the base of the event qualifying and for Dem scheduling. Tags: atp.recommendedPackage=DiagnosticOperationCycles			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
automaticEnd	Boolean	0..1	attr	<p>If set to true the driving cycle shall automatically end at either Dem_Shutdown() or Dem_Init().</p> <p>This attribute is only relevant for the AUTOSAR adaptive platform. It no longer has a meaning on the AUTOSAR classic platform.</p>
cycleStatusStorage	Boolean	0..1	attr	<p>Defines if the operation cycle state is available over the power cycle (stored non-volatile) or not.</p> <ul style="list-style-type: none"> • true: the operation cycle state is stored non-volatile

△

Class	DiagnosticOperationCycle			
				<p style="text-align: right;">△</p> <ul style="list-style-type: none"> • false: the operation cycle state is only stored volatile <p>This attribute is only relevant for the AUTOSAR adaptive platform. It no longer has a meaning on the AUTOSAR classic platform.</p>
type	DiagnosticOperationCycleTypeEnum	0..1	attr	Operation cycles types for the Dem.

Table 6.57: DiagnosticOperationCycle

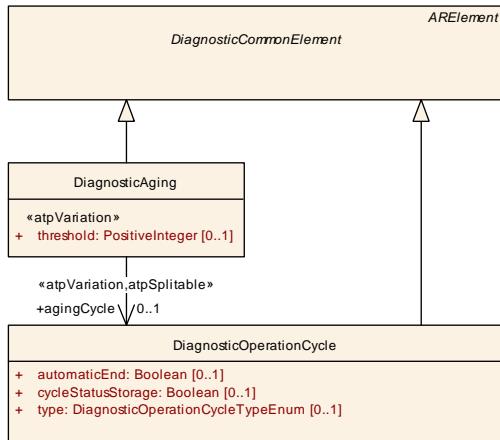
Enumeration	DiagnosticOperationCycleTypeEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticOperationCycle
Note	Operation cycles types used to identify certain Operation cycles with a certain semantics.
Literal	Description
ignition	Ignition ON / OFF cycle Tags: atp.EnumerationLiteralIndex=0
obdDrivingCycle	OBD Driving cycle Tags: atp.EnumerationLiteralIndex=1
other	further operation cycle Tags: atp.EnumerationLiteralIndex=2
warmup	OBD Warm up cycle Tags: atp.EnumerationLiteralIndex=5

Table 6.58: DiagnosticOperationCycleTypeEnum

6.11 DiagnosticAging

[TPS_DEXT_03021] Aging [It is possible to remove a specific event from the event memory, if its fault conditions are not fulfilled for a certain period of time. This process is called as aging or unlearning.] (*RS_DEXT_00055*)

This semantics is formalized by means of the meta-class [DiagnosticAging](#).] (*RS_DEXT_00055*)


Figure 6.27: Modeling of DiagnosticAging

Class	DiagnosticAging			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticAging			
Note	Defines the aging algorithm. Tags: atp.recommendedPackage=DiagnosticAgings			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
agingCycle	DiagnosticOperation Cycle	0..1	ref	<p>This represents the applicable aging cycle. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=agingCycle.diagnosticOperationCycle, agingCycle.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
threshold	PositiveInteger	0..1	attr	<p>Number of aging cycles needed to unlearn/delete the event. Stereotypes: atpVariation Tags:vh.latestBindingTime=preCompileTime</p>

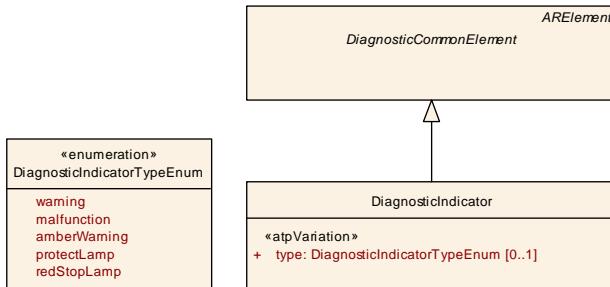
Table 6.59: DiagnosticAging

[constr_1848] Existence of attribute **DiagnosticAging.agingCycle** [For each **DiagnosticAging**, attribute **agingCycle** shall exist **at the time when the DEXT is complete.**.]()

[constr_1849] Existence of attribute **DiagnosticAging.threshold** [For each **DiagnosticAging**, attribute **threshold** shall exist **at the time when the DEXT is complete.**.]()

6.12 DiagnosticIndicator

[TPS_DEXT_03022] Different kinds of **DiagnosticIndicators** [Different **types** of Indicators can be defined with the **DiagnosticIndicator** element. For this, the attribute **DiagnosticIndicator.type** shall be used.] (**RS_DEXT_00056**)


Figure 6.28: Modeling of DiagnosticIndicator

Class	DiagnosticIndicator			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticIndicator			
Note	Definition of an indicator. Tags: atp.recommendedPackage=DiagnosticIndicators			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
type	DiagnosticIndicatorTypeEnum	0..1	attr	Defines the type of the indicator. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.60: DiagnosticIndicator

Enumeration	DiagnosticIndicatorTypeEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticIndicator
Note	Type of an indicator.
Literal	Description
amberWarning	Amber Warning Lamp Tags: atp.EnumerationLiteralIndex=0
malfunction	Malfunction Indicator Lamp Tags: atp.EnumerationLiteralIndex=1
protectLamp	Protect Lamp Tags: atp.EnumerationLiteralIndex=2
redStopLamp	Red Stop Lamp Tags: atp.EnumerationLiteralIndex=3
warning	Warning Tags: atp.EnumerationLiteralIndex=4

Table 6.61: DiagnosticIndicatorTypeEnum

6.13 DiagnosticTestResult

The meta-class **DiagnosticTestResult** allows for a formal definition of a diagnostic test result. The purpose of this meta-class is to support the reporting of the latest test results back to a client. This is of special importance for the OBD service mode 0x06, see chapter [5.6.5](#).

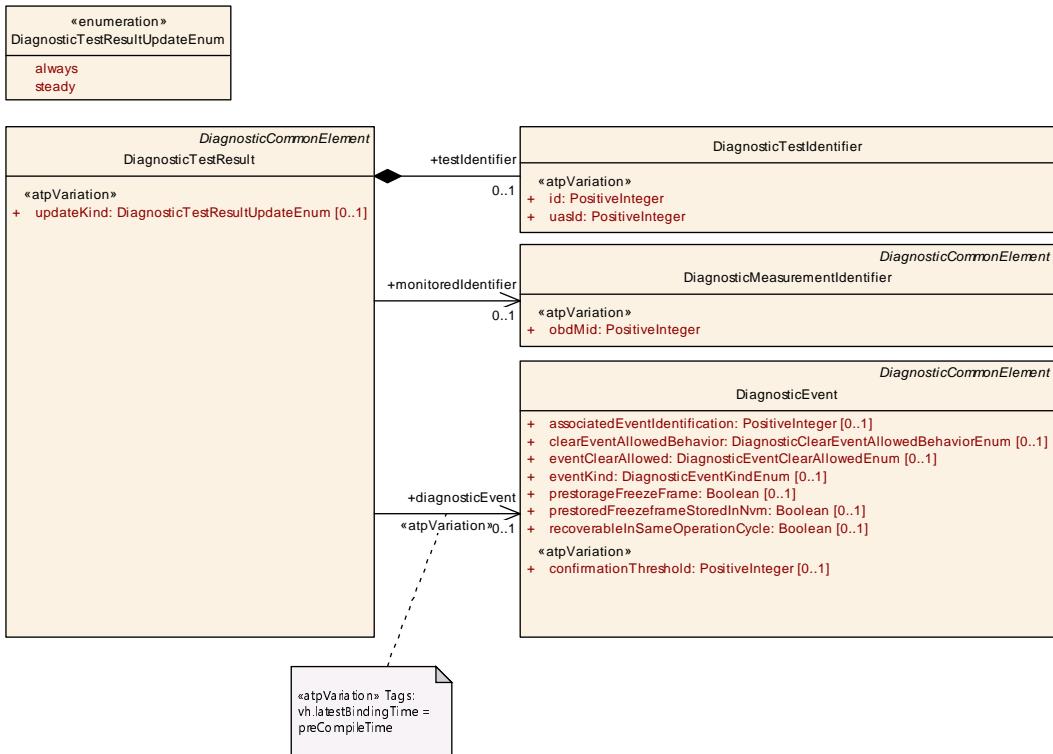


Figure 6.29: Modeling of DiagnosticTestResult

Class	DiagnosticTestResult			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTestResult			
Note	This meta-class represents the ability to define diagnostic test results. Tags: atp.recommendedPackage=DiagnosticTestResults			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	DiagnosticEvent	0..1	ref	This attribute represents the diagnostic event that is related to the diagnostic test result. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
monitoredIdentifier	DiagnosticMeasurementIdentifier	0..1	ref	This attribute represents the related diagnostic monitored identifier.
testIdentifier	DiagnosticTestIdentifier	0..1	aggr	This attribute represents the applicable test identifier.
updateKind	DiagnosticTestResultUpdateEnum	0..1	attr	This attribute controls the update behavior of the enclosing DiagnosticTestResult. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.62: DiagnosticTestResult

[constr_1850] Existence of aggregation DiagnosticTestResult.testIdentifier [For each `DiagnosticTestResult`, the aggregation of meta-class `DiagnosticTestIdentifier` in the role `testIdentifier` shall exist **at the time when the DEXT is complete.**] ()

[constr_1851] Existence of reference `DiagnosticTestResult.monitoredIdentifier` [For each `DiagnosticTestResult`, the reference to meta-class `DiagnosticTestIdentifier` in the role `monitoredIdentifier` shall exist **at the time when the DEXT is complete.**] ()

Enumeration	<code>DiagnosticTestResultUpdateEnum</code>
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTestResult
Note	This meta-class represents the ability to define the update behavior of a <code>DiagnosticTestResult</code> .
Literal	Description
always	Any DTR result reported by the monitor is used by the Dem. Tags: atp.EnumerationLiteralIndex=0
steady	The Dem accepts reported DTRs only when the configured debouncing mechanism is stable at the FAIL or PASS limit. Tags: atp.EnumerationLiteralIndex=1

Table 6.63: `DiagnosticTestResultUpdateEnum`

Class	<code>DiagnosticTestIdentifier</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTestResult			
Note	This meta-class represents the ability to create a diagnostic test identifier.			
Base	<code>ARObject</code>			
Attribute	Type	Mult.	Kind	Note
id	PositiveInteger	1	attr	This represents the numerical id associated with the diagnostic test identifier. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
uasId	PositiveInteger	1	attr	This represents the unit and scaling Id of the diagnostic test result. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.64: `DiagnosticTestIdentifier`

Class	<code>DiagnosticMeasurementIdentifier</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTestResult			
Note	This meta-class represents the ability to describe a measurement identifier. Tags: atp.recommendedPackage=DiagnosticMeasurementIdentifiers			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
obdMid	PositiveInteger	1	attr	This represents the numerical measurement Id Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime

Table 6.65: `DiagnosticMeasurementIdentifier`

6.14 OBD-related aspects of Dem Configuration

The support for OBD-related [18] modeling requires the addition of some pretty global (i.e. on the level of an entire ECU) attribute that could be added to the [EcuInstance](#).

However, this would not align with the idea of a decentralized configuration of the diagnostic stack where information is added at a point in time when an actual [EcuInstance](#) is not yet available.

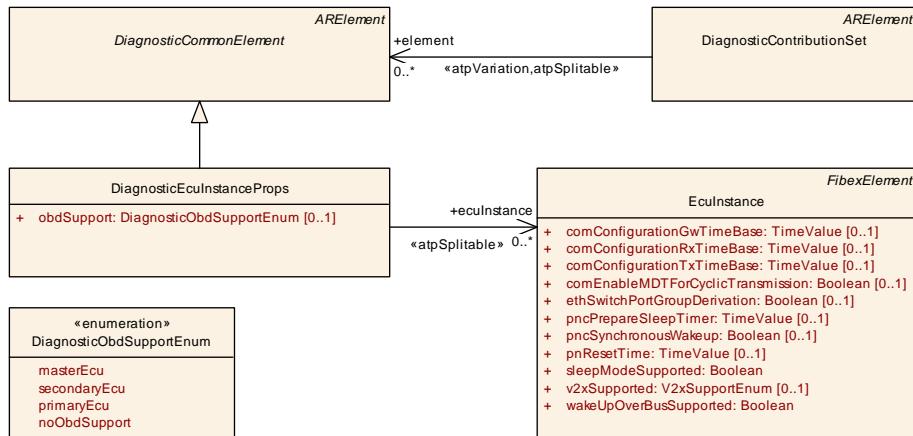


Figure 6.30: Modeling of [DiagnosticEcuInstanceProps](#)

Therefore, the attributes applying for the ECU-level are added to the meta-class [DiagnosticEcuInstanceProps](#).

[TPS_DEXT_01122] Indication whether a [EcuInstance](#) supports OBD [The attribute [DiagnosticEcuInstanceProps.obdSupport](#) is taken to define whether a given [EcuInstance](#) shall support OBD and in which way OBD shall be supported on this Ecu.] ([RS_DEXT_00058](#))

Class	DiagnosticEcuInstanceProps			
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticContribution			
Note	This meta-class represents the ability to model properties that are specific for a given EcuInstance but on the other hand represent purely diagnostic-related information. In the spirit of decentralized configuration it is therefore possible to specify the diagnostic-related information related to a given EcuInstance even if the EcuInstance does not yet exist. Tags: atp.recommendedPackage=DiagnosticEcuInstanceProps			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
ecuInstance	EcuInstance	*	ref	This represents the actual EcuInstance to which the information contained in the DiagnosticEcuInstance contribute. Stereotypes: atpSplittable Tags: atp.Splitkey=ecuInstance





Class	DiagnosticEcuInstanceProps			
obdSupport	DiagnosticObdSupport Enum	0..1	attr	This attribute is used to specify the role (if applicable) in which the DiagnosticEcuInstance supports OBD.

Table 6.66: DiagnosticEcuInstanceProps

[constr_1852] Existence of attribute `DiagnosticEcuInstanceProps.obdSupport` [For each `DiagnosticEcuInstanceProps`, attribute `obdSupport` shall exist at the time when the DEXT is complete.]()

Enumeration	DiagnosticObdSupportEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::DiagnosticContribution
Note	This meta-class represents the ability to model the roles in which a participation in OBD is foreseen. At the moment, this applies exclusively to the Dem. However, future extension of the Dcm may require this setting as well.
Literal	Description
masterEcu	This represent the role "master ECU". Tags: atp.EnumerationLiteralIndex=0
noObdSupport	This represents the ability to explicitly specify that no participation in OBD is foreseen. Tags: atp.EnumerationLiteralIndex=1
primaryEcu	This represents the role "primary ECU". Tags: atp.EnumerationLiteralIndex=2
secondaryEcu	This represents the role "secondary ECU". Tags: atp.EnumerationLiteralIndex=3

Table 6.67: DiagnosticObdSupportEnum

Another OBD-related feature of the Dem is the support for the computation of the *In-Use-Monitor Performance Ratio* (IUMPR). It is possible to define a so-called `DiagnosticIumprGroup` that encapsulates the computation of a group of `DiagnosticEvents`.

The modeling of the `DiagnosticIumprDenominatorGroup` supports the configuration of additional environmental conditions that shall be applied on the increment of the IUMPR denominator.

From the modeling point of view, neither `DiagnosticIumprGroup` nor `DiagnosticIumprDenominatorGroup` reference the associated `DiagnosticEvent` directly.

But since the `DiagnosticIumpr` referenced in the role `iumpr` in turn references at most one `DiagnosticEvent` the resulting relation effectively boils down to `DiagnosticIumprGroup` and `DiagnosticIumprDenominatorGroup` being able to precisely define the collection of affected `DiagnosticEvents`.

[TPS_DEXT_01148] Standardized values of `DiagnosticIumprGroup.category` [The semantics of meta-class `DiagnosticIumprGroup` is identified by means of the value of attribute `DiagnosticIumprGroup.category`.

Standardized values of attribute `DiagnosticIumprGroup.category` are:

- IUMPR_AFRI1
- IUMPR_AFRI2
- IUMPR_BOOSTPRS
- IUMPR_CAT1
- IUMPR_CAT2
- IUMPR_EGR
- IUMPR_EGSENSOR
- IUMPR_EVAP
- IUMPR_FLSYS
- IUMPR_NMHCAT
- IUMPR_NOXADSORB
- IUMPR_NOXCAT
- IUMPR_OXS1
- IUMPR_OXS2
- IUMPR_PF1
- IUMPR_PF2
- IUMPR_PMFILTER
- IUMPR_PRIVATE
- IUMPR_SAIR
- IUMPR_SECOXS1
- IUMPR_SECOXS2

] (RS_DEXT_00078)

[TPS_DEXT_01149] Standardized values of DiagnosticIumprDenominator-Group.category [The semantics of meta-class **DiagnosticIumprDenominator-Group** is identified by means of the value of attribute **DiagnosticIumprDenominatorGroup.category**.

Standardized values of attribute **DiagnosticIumprDenominatorGroup.category** are:

- IUMPR_DENOMINATOR_500_MILES
- IUMPR_DENOMINATOR_COLDSTART
- IUMPR_DENOMINATOR_EVAP

- IUMPR_DENOMINATOR_NONE
 - IUMPR_DENOMINATOR_PHYSICAL_API

] (RS_DEXT_00078)

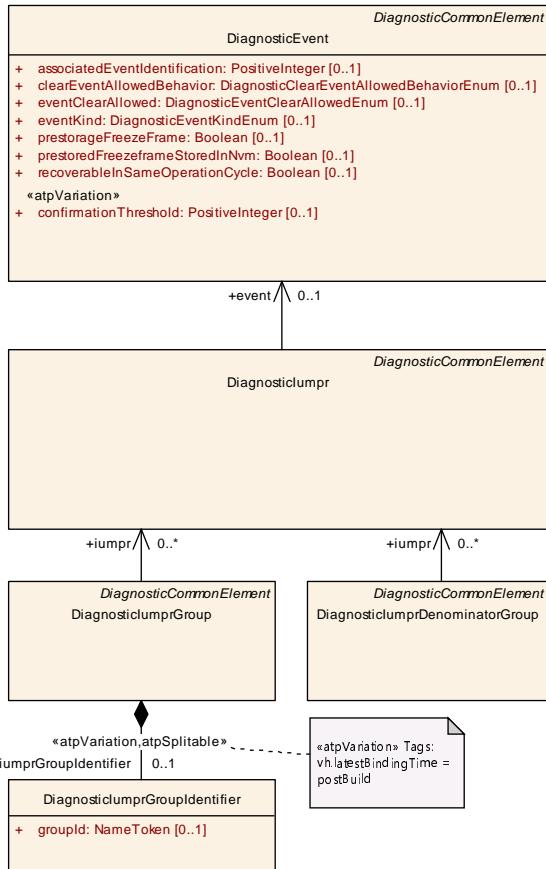


Figure 6.31: Modeling of IUMPR handling for diagnostic events

Class	Diagnosticclumper								
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent								
Note	This meta-class represents the ability to model the in-use monitor performance ratio. The latter computes to the number of times a fault could have been found divided by the number of times the vehicle conditions have been properly fulfilled.								
	Tags: atp.recommendedPackage=Diagnosticclumpers								
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>								
Attribute	<table border="1"> <thead> <tr> <th>Type</th> <th>Mult.</th> <th>Kind</th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>DiagnosticEvent</td> <td>0..1</td> <td>ref</td> <td>This reference represents the DiagnosticEvent that corresponds to the IUMPR computation.</td> </tr> </tbody> </table>	Type	Mult.	Kind	Note	DiagnosticEvent	0..1	ref	This reference represents the DiagnosticEvent that corresponds to the IUMPR computation.
Type	Mult.	Kind	Note						
DiagnosticEvent	0..1	ref	This reference represents the DiagnosticEvent that corresponds to the IUMPR computation.						

Table 6.68: Diagnosticlumpr

Class	DiagnosticlumprGroup			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This meta-class represents the ability to model a IUMPR groups. Tags: atp.recommendedPackage=DiagnosticlumprGroups			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, Multilanguage Referrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
iump	Diagnosticlumpr	*	ref	This reference collects Diagnosticlumpr to a DiagnosticlumprGroup.
iumpGroupIdentifier	DiagnosticlumprGroup Identifier	0..1	aggr	<p>This aggregation allows for the variant modeling of the groupIdentifier.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=iumpGroupIdentifier, iumpGroupIdentifier.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>

Table 6.69: DiagnosticlumprGroup

[constr_1853] Existence of attribute *DiagnosticIumprGroup.iumpGroupIdentifier* [For each *DiagnosticIumprGroup*, attribute *iumpGroupIdentifier* shall exist **at the time when the DEXT is complete.**] ()

Class	DiagnosticlumprGroupIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This meta-class provides the ability to define the group identifier for an lumprGroup.			
Base	<i>ARObject</i>			
Attribute	Type	Mult.	Kind	Note
groupId	NameToken	0..1	attr	This attribute shall be taken to define an identifier for the IUMPR group. Please note that the value of this identifier is driven by regulations outside the scope of AUTOSAR and can therefore not be limited to the set of characters suitable for a shortName.

Table 6.70: DiagnosticlumprGroupIdentifier

[constr_1854] Existence of attribute *DiagnosticIumprGroupIdentifier.groupId* [For each *DiagnosticIumprGroupIdentifier*, attribute *groupId* shall exist **at the time when the DEXT is complete.**] ()

Class	DiagnosticlumprDenominatorGroup			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This meta-class represents the ability to model a IUMPR denominator groups. Tags: atp.recommendedPackage=DiagnosticlumprDenominatorGroup			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, Multilanguage Referrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note





Class	DiagnosticlumprDenominatorGroup		
iumpr	Diagnosticlumpr	*	ref

Table 6.71: DiagnosticlumprDenominatorGroup

6.14.1 Dem Configuration for OBD-II

The modeling of DTCs for the OBD-II use case is pretty similar to the modeling of DTCs for the UDS use case. In other words, [DiagnosticTroubleCodeObd](#) references the [DiagnosticTroubleCodeProps](#) in the same way that this meta-class is referenced from [DiagnosticTroubleCodeUds](#).

Please note that the meta-class [DiagnosticTroubleCodeObd](#) is only applicable for the implementation of OBD-II.

[TPS_DEXT_01111] Legislative freeze frame for the OBD-II case [For the implementation of OBD-II, the legislative freeze frame is obtained from running the OBD Mode 0x02 service, modeled by means of meta-class [DiagnosticPowertrain-FreezeFrame](#).]()

[constr_1459] Existence of attributes of [DiagnosticTroubleCodeProps](#) [The following list of attributes of meta-class [DiagnosticTroubleCodeProps](#) are not required and therefore shall be ignored if the [DiagnosticTroubleCodeProps](#) is referenced in the role [dtcProps](#) from a [DiagnosticTroubleCodeObd](#):

- [freezeFrame](#)
- [snapshotRecordContent](#)
- [memoryDestination](#)
- [extendedDataRecord](#)
- [aging](#)

]()

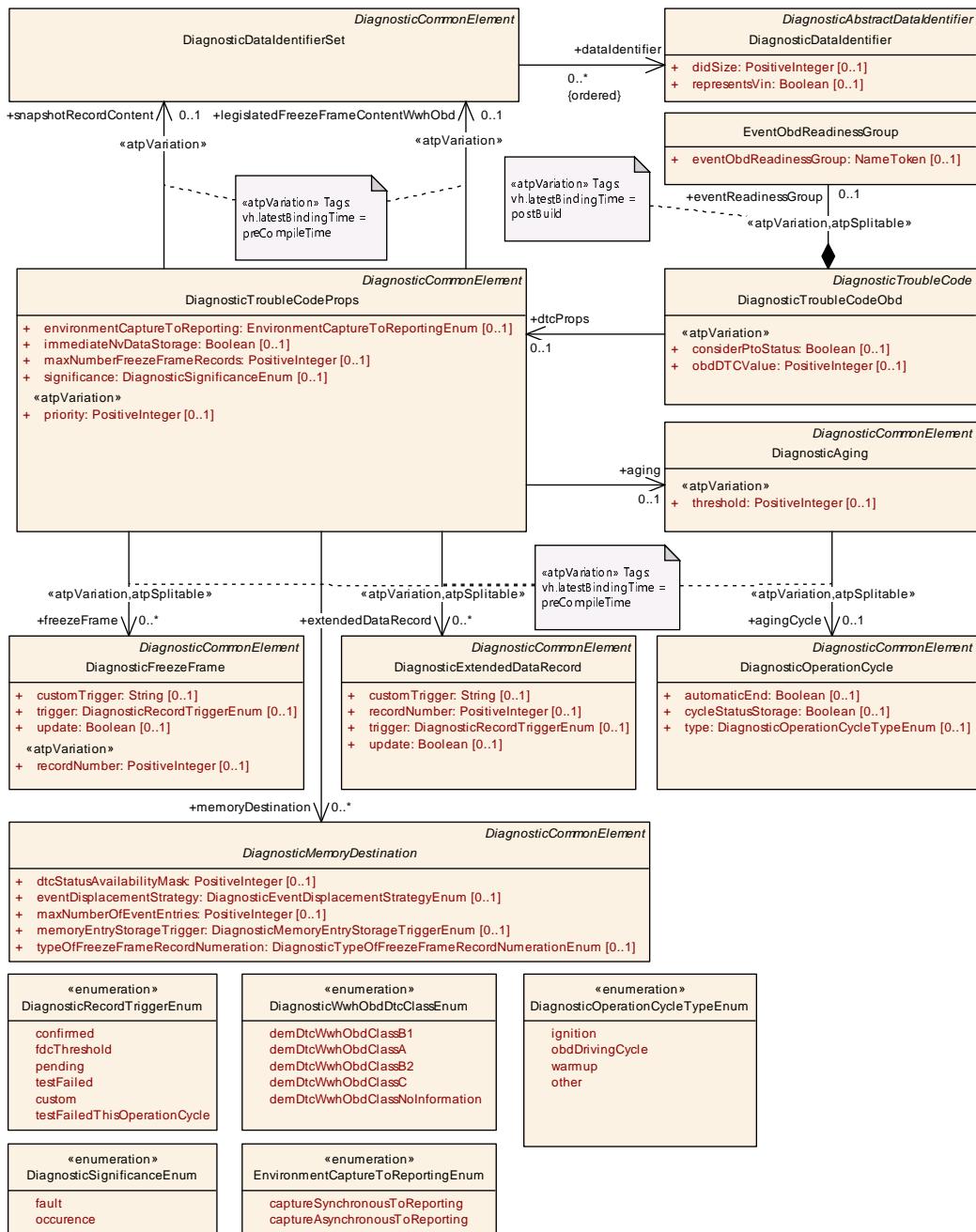


Figure 6.32: Modeling of DTCs for OBD-II

6.14.2 Dem Configuration for WWH-OBD

[TPS_DEXT_01112] Definition of a diagnostic trouble code for the implementation of WWH-OBD [The definition of a diagnostic trouble code for the implementation of WWH-OBD implies the existence of a [DiagnosticTroubleCodeUds](#) where attribute `wwhObdDtcClass` is set to any value other than `demDtcWwhObdClassNoInformation`.]()

[TPS_DEXT_01093] Definition of legislative freeze frame for WWH-OBD [The legislative WWH-OBD freeze frame is identified by the reference `DiagnosticTroubleCodeProps.freezeFrame` where attribute `recordNumber` is set to the value 0.

Optionally, the existence of a reference in the role `DiagnosticTroubleCodeProps.extendedDataRecord` with attribute `recordNumber` set to the value 90 is supported.]()

7 Functional Inhibition

7.1 Introduction

Conceptually, the Fim [14] is closely related to the Dem since it handles the relation of functionality (expressed via the so-called *function identifier*, or in short-form: *Fid*) and linked [DiagnosticEvents](#).

7.2 Alias Events

The close relation of Fim and Dem may have consequences in a distributed configuration: it may not be possible to configure the Fim before the Dem is configured because model elements (especially [DiagnosticEvent](#)) from the Dem configuration are required to model the Fim configuration.

This leads to the definition of [DiagnosticFimAliasEvent](#)s that can be taken to model the Fim configuration even of no Dem configuration exists or if configurations with different Dem event names shall be considered for the final projects.

Please note, however, that the definition of [DiagnosticFimAliasEvent](#)s is not mandatory for the configuration of the Fim. It is possible to directly take the existence of [DiagnosticEvent](#)s into account and thereby bypass the definition of [DiagnosticFimAliasEvent](#)s.

Class	DiagnosticFimAliasEvent			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class is used to represent a given event semantics. However, the name of the actual events used in a specific project is sometimes not defined yet, not known or not in the responsibility of the author. Therefore, the DiagnosticFimAliasEvent has a reference to the actual DiagnosticEvent and by this the final connection is created. Tags: atp.recommendedPackage=DiagnosticFimAliasEvents			
Base	ARElement , ARObject , CollectableElement , DiagnosticAbstractAliasEvent , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 7.1: [DiagnosticFimAliasEvent](#)

Class	DiagnosticAbstractAliasEvent (abstract)			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This meta-class represents an abstract base class for all diagnostic alias events.			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Subclasses	DiagnosticFimAliasEvent , DiagnosticFimAliasEventGroup			



△

Class	<i>DiagnosticAbstractAliasEvent</i> (abstract)			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 7.2: DiagnosticAbstractAliasEvent

7.3 Function Identifier

The support of the Fim as an extension of the Dem meta-model requires the modeling of additional meta-classes to describe the various ways of possible mappings between [DiagnosticEvents](#) and Fids (or, in terms of the meta-model, [DiagnosticFunctionIdentifier](#)).

[TPS_DEXT_01121] Semantics of DiagnosticFunctionIdentifier [A [DiagnosticFunctionIdentifier](#) can be inhibited by different sources, i.e. in different ways:

Event This corresponds to the [DiagnosticEvent](#).

Fim Event Group This represents a group of events that is defined in the scope of the Fim (within the Fim terminology, this is also known as a *summary event*). In the meta-model, a *Fim Event Group* is represented by means of meta-class [DiagnosticFimEventGroup](#).

To emphasize the locality the corresponding meta-class has been named [DiagnosticFimEventGroup](#). [DiagnosticFimEventGroup](#) is able to reference 0..* [DiagnosticEvents](#) in the role *event*.

This way, the membership of [DiagnosticEvents](#) in the hypothetical group of events formed by the [DiagnosticFimEventGroup](#) is expressed.

] (RS_DEXT_00060)

Please note that [DiagnosticEvent](#) is discussed in chapter [6.2](#).

Class	DiagnosticFunctionIdentifier			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents a diagnostic function identifier (a.k.a. FID). Tags:atp.recommendedPackage=DiagnosticFunctionIdentifiers			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 7.3: DiagnosticFunctionIdentifier

Finally all sources will refer to [DiagnosticEvents](#).

7.4 Mapping between Inhibition Source and Diagnostic Event

The configuration of the Fim requires the clarification of the relation between a particular inhibition source (modeled as `DiagnosticFunctionInhibitSource`) and one or many diagnostic events (modeled as `DiagnosticEvent`).

The easiest way to provide this information is the usage of the `DiagnosticInhibitSourceEventMapping` that is able to create an association between a `DiagnosticFunctionInhibitSource` on the one hand and either a `DiagnosticEvent` or a `DiagnosticFimEventGroup` on the other hand.

This is only possible if the `DiagnosticEvents` referenced by the `DiagnosticInhibitSourceEventMapping` already exist. This existence is subject to the development workflow and may or may not apply. For more details, please refer to Figure 7.1.

Class	<code>DiagnosticInhibitSourceEventMapping</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to map a <code>DiagnosticFunctionInhibitSource</code> directly to alternatively one <code>DiagnosticEvent</code> or one <code>DiagnosticFimSummaryEvent</code> . This model element shall be used if the approach via the alias events is not applicable, i.e. when diagnostic events defined by the Dem are already available at the time the Fim configuration within the diagnostic extract is created. Tags:atp.recommendedPackage=DiagnosticInhibitSourceEventMappings			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>DiagnosticMapping</code> , <code>Identifiable</code> , <code>MultilingualReferable</code> , <code>PackageableElement</code> , <code>Referable</code>			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	<code>DiagnosticEvent</code>	0..1	ref	This represents the reference to the diagnostic event.
eventGroup	<code>DiagnosticFimEventGroup</code>	0..1	ref	This represents the reference to the event group
inhibitionSource	<code>DiagnosticFunctionInhibitSource</code>	0..1	ref	This represents the reference to the inhibition source.

Table 7.4: `DiagnosticInhibitSourceEventMapping`

7.5 Alias Event Mapping

[TPS_DEXT_01095] Definition of “alias” diagnostic event for the creation of a Fim configuration in the diagnostic extract [A pre-configuration of the Fim function inhibition can be created on the basis of the following meta-classes:

`DiagnosticFimAliasEventMapping` in this case the definition of “alias” diagnostic event corresponds to a single `DiagnosticEvent`

`DiagnosticFimAliasEventGroupMapping` in this case the definition of a group of “alias” diagnostic events corresponds to a group of single `DiagnosticEvents`
](`RS_DEXT_00061`, `RS_DEXT_00062`)

Class	DiagnosticFimAliasEventMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticEvent			
Note	This meta-class represents the ability to model the mapping of a DiagnosticEvent to a DiagnosticAlias Event. By this means the "preliminary" modeling by way of a DiagnosticAliasEvent is further substantiated. Tags: atp.recommendedPackage=DiagnosticFimEventMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
actualEvent	DiagnosticEvent	0..1	ref	This represents the reference to the actual diagnostic event.
aliasEvent	DiagnosticFimAlias Event	0..1	ref	This represents the reference to the alias event.

Table 7.5: DiagnosticFimAliasEventMapping

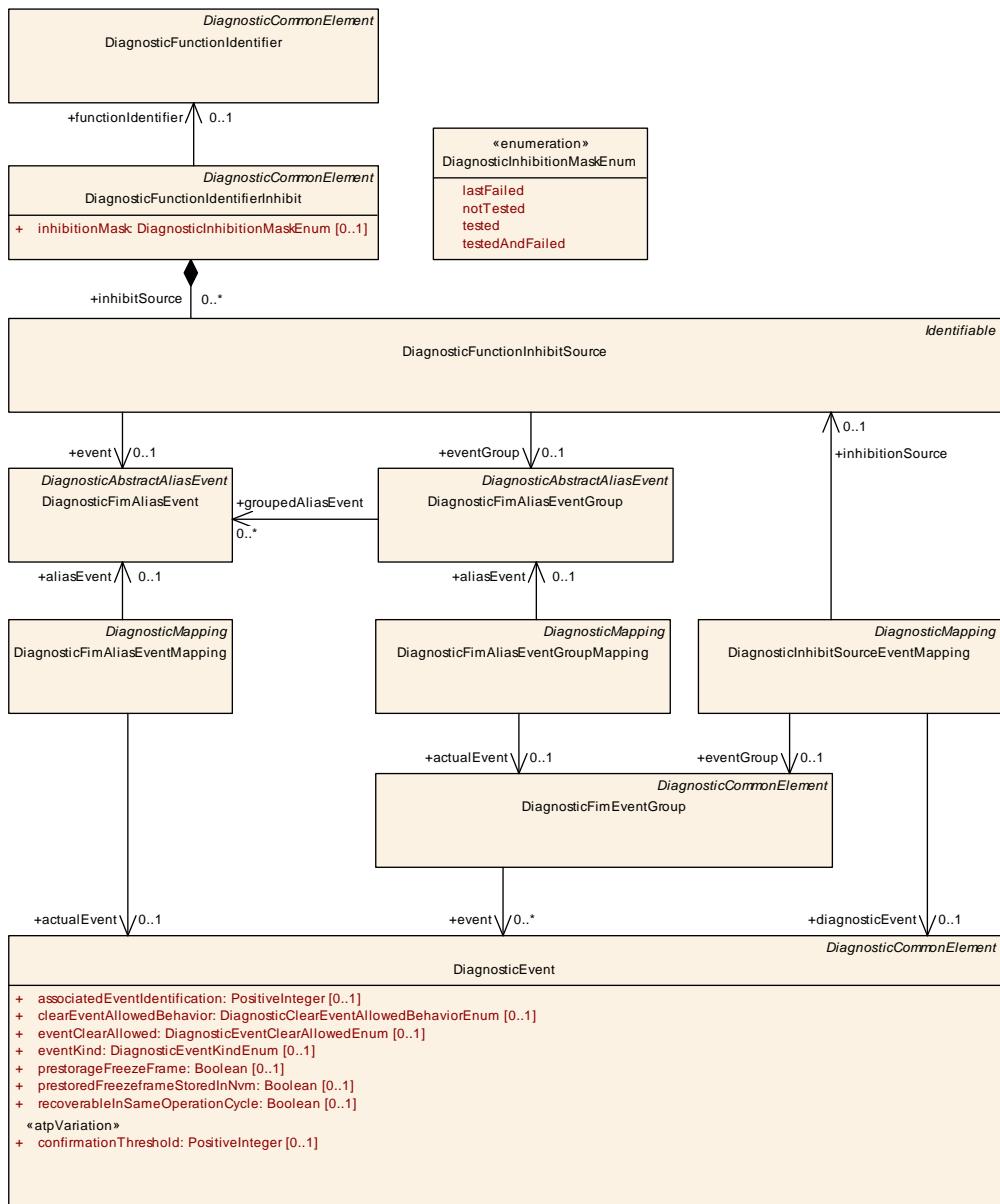
Class	DiagnosticFimAliasEventGroup			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to define an alias for a Fim summarized event. This alias can be used in early phases of the configuration process until a further refinement is possible. Tags: atp.recommendedPackage=DiagnosticFimAliasEventGroups			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticAbstractAliasEvent, DiagnosticCommonElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
groupedAlias Event	DiagnosticFimAlias Event	*	ref	By means of this reference the grouping of Diagnostic AliasEvents within the DiagnosticFimSummaryEvent can be specified.

Table 7.6: DiagnosticFimAliasEventGroup

Class	DiagnosticFimAliasEventGroupMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to map a DiagnosticFimEventGroup to a DiagnosticFimAliasEvent Group. By this means the "preliminary" modeling by way of a DiagnosticFimAliasEventGroup is further substantiated. Tags: atp.recommendedPackage=DiagnosticFimAliasEventGroupMappings			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
actualEvent	DiagnosticFimEvent Group	0..1	ref	This represents the reference to the actual summary event.
aliasEvent	DiagnosticFimAlias EventGroup	0..1	ref	This represents the reference to the alias summary event.

Table 7.7: DiagnosticFimAliasEventGroupMapping

Ultimately, the modeling approach for the Fim starts at the definition of the concept of a function itself by means of the meta-class *DiagnosticFunctionIdentifier*.


Figure 7.1: Big Picture of Fim diagnostics configuration

Class	DiagnosticFunctionIdentifierInhibit			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to define the inhibition of a specific function identifier within the Fim configuration.			
Tags:	atp.recommendedPackage=DiagnosticFunctionIdentifierInhibits			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>Identifiable</i> , <i>Multilanguage Referrable</i> , <i>PackageableElement</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
function Identifier	DiagnosticFunction Identifier	0..1	ref	This represents the corresponding function identifier.





Class	DiagnosticFunctionIdentifierInhibit			
inhibitionMask	DiagnosticInhibitionMaskEnum	0..1	attr	This represents the value of the inhibition mask behavior.
inhibitSource	DiagnosticFunctionInhibitSource	*	aggr	This represents a collection of DiagnosticFunctionInhibitSource that contribute to the configuration of the enclosing DiagnosticFunctionIdentifierInhibit.

Table 7.8: DiagnosticFunctionIdentifierInhibit

[constr_1855] Existence of attribute DiagnosticFunctionIdentifierInhibit.inhibitionMask [For each DiagnosticFunctionIdentifierInhibit, attribute inhibitionMask shall exist at the time when the DEXT is complete.]()

Class	DiagnosticFunctionInhibitSource			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to define an inhibition source in the context of the Fim configuration.			
Base	ARObject, Identifiable, MultilanguageReferrable, Referrable			
Attribute	Type	Mult.	Kind	Note
event	DiagnosticFimAliasEvent	0..1	ref	This represents the alias event applicable for the referencing inhibition source.
eventGroup	DiagnosticFimAliasEventGroup	0..1	ref	This represents the event group applicable for the referencing inhibition source.

Table 7.9: DiagnosticFunctionInhibitSource

Enumeration	DiagnosticInhibitionMaskEnum			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to define different kinds of inhibition mask behavior.			
Literal	Description			
lastFailed	This represents the inhibition mask behavior "last failed". Tags: atp.EnumerationLiteralIndex=0			
notTested	This represents the inhibition mask behavior "not tested". Tags: atp.EnumerationLiteralIndex=1			
tested	This represents the inhibition mask behavior "tested". Tags: atp.EnumerationLiteralIndex=3			
testedAndFailed	This represents the inhibition mask behavior "tested and failed". Tags: atp.EnumerationLiteralIndex=2			

Table 7.10: DiagnosticInhibitionMaskEnum

[TPS_DEXT_01096] Semantics of DiagnosticFunctionInhibitSource [The function inhibition itself is modeled by means of a different meta-class named DiagnosticFunctionIdentifierInhibit. This meta-class, in turn, references the DiagnosticFunctionIdentifier and it also aggregates 0..* instances of a further meta-class named DiagnosticFunctionInhibitSource.]

DiagnosticFunctionInhibitSource inherits from Identifiable in order to be able to utilize attributes like desc, adminData, and introduction for the purpose of textually explaining the reason for defining a certain inhibit source.] ([RS_DEXT_00060](#))

[TPS_DEXT_01097] Standardized value of `StructuredReq.category` for the modeling of `DiagnosticFunctionInhibitSource` [If `DiagnosticFunctionInhibitSource.introduction.structuredReq` is used to document the reason for a specific function inhibition then `DiagnosticFunctionInhibitSource.introduction.structuredReq.category` shall be set to the value `InhibitReason`.] (*RS_DEXT_00060*)

[constr_1453] References from `DiagnosticFunctionInhibitSource` [Each `DiagnosticFunctionInhibitSource` may either reference one of the following meta-classes in their respective roles:

- `DiagnosticFimAliasEventMapping` in the role `event`
- `DiagnosticFimAliasEventGroupMapping` in the role `eventGroup`

]()

Class	<code>DiagnosticFimEventGroup</code>			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Fim			
Note	This meta-class represents the ability to model a Fim event group, also known as a summary event in Fim terminology. This represents a group of single diagnostic events. Tags: atp.recommendedPackage=DiagnosticFimEventGroups			
Base	<code>ARElement</code> , <code>ARObject</code> , <code>CollectableElement</code> , <code>DiagnosticCommonElement</code> , <code>Identifiable</code> , <code>MultilanguageReferrable</code> , <code>PackageableElement</code> , <code>Referrable</code>			
Attribute	Type	Mult.	Kind	Note
event	<code>DiagnosticEvent</code>	*	ref	This reference represents the way of grouping diagnostic events into a summary event in the context of the Fim.

Table 7.11: `DiagnosticFimEventGroup`

[TPS_DEXT_01098] Semantics of attribute `DiagnosticFunctionInhibitSource.event` [If the reference `DiagnosticFunctionInhibitSource.event` exists this means the inhibition applies for a single `DiagnosticEvent`.] (*RS_DEXT_00060, RS_DEXT_00061*)

[TPS_DEXT_01099] Semantics of attribute `DiagnosticFunctionInhibitSource.eventGroup` [If the reference `DiagnosticFunctionInhibitSource.eventGroup` exists this means that the inhibition effectively applies for a group of `DiagnosticEvent`s where the actual grouping is defined in the scope of the Fim.] (*RS_DEXT_00060, RS_DEXT_00061*)

[TPS_DEXT_01100] Consequence of the existence of `DiagnosticFimAliasEventMapping` [The references from meta-class `DiagnosticFimAliasEventMapping` in the roles `actualEvent` and `aliasEvent` do not necessarily have to exist at the same time. The following rules apply:

Only `actualEvent` exists: In this case there is no `DiagnosticFimAliasEvent` available and the actual `DiagnosticEvent` can directly be taken for creating the Fim configuration.

Only `aliasEvent` exists: In this case the configuration is considered incomplete and only defines the intended semantics from the point of view of a pre-configuration of the Fim.

Both `actualEvent` and `aliasEvent` exist: In this case it is obvious that the configuration has undergone a pre-configuration step in which a `DiagnosticFimAliasEvent` has been used. However, since the `DiagnosticEvent` in the role `actualEvent` exists the Diagnostic Extract is considered complete with respect to this aspect of the Fim configuration.

](*RS_DEXT_00060, RS_DEXT_00061*)

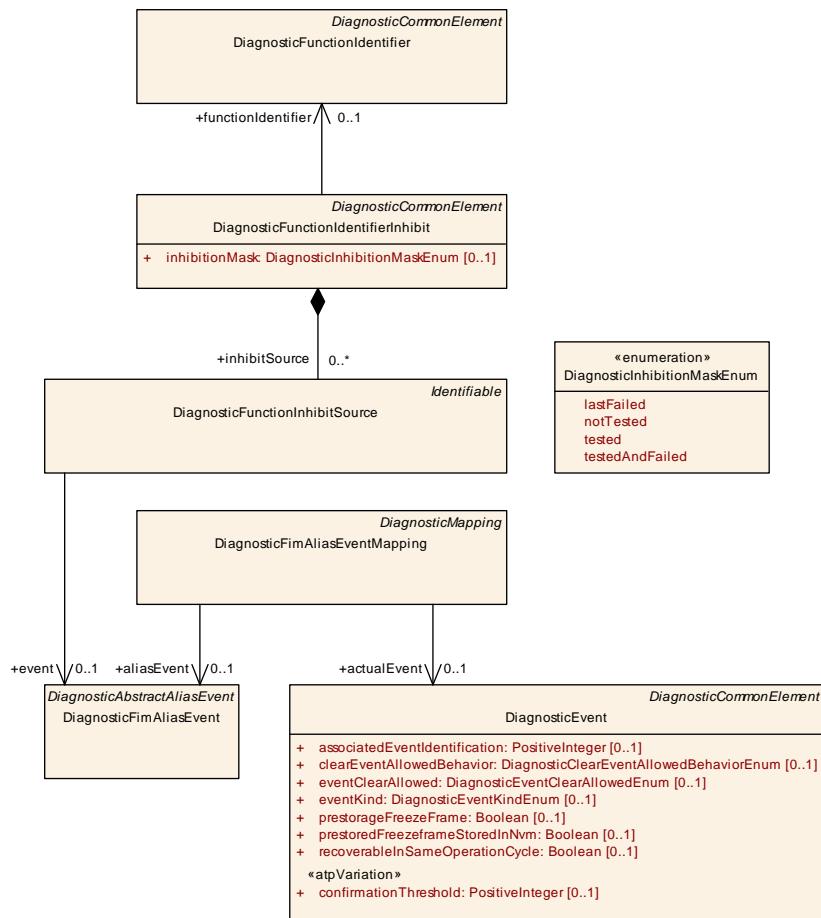


Figure 7.2: Inhibition of events in Fim for diagnostics configuration

[TPS_DEXT_01101] Consequence of the existence of `DiagnosticFimAliasEventGroupMapping` [The references from meta-class `DiagnosticFimAliasEventGroupMapping` in the roles `actualEvent` and `aliasEvent` do not necessarily have to exist at the same time. The following rules apply:

Only `actualEvent` exists: In this case there is no `DiagnosticFimAliasEventGroup` available and the actual `DiagnosticFimEventGroup` can directly be taken for creating the Fim configuration.

Only `aliasEvent` exists: In this case the configuration is considered incomplete and only defines the intended semantics from the point of view of a pre-configuration of the Fim.

Both `actualEvent` and `aliasEvent` exist: In this case it is obvious that the configuration has undergone a pre-configuration step in which a `DiagnosticFimAliasEventGroup` has been used. However, since the `DiagnosticFimEventGroup` in the role `actualEvent` exists the Diagnostic Extract is considered complete with respect to this aspect of the Fim configuration.

]([RS_DEXT_00060](#), [RS_DEXT_00061](#))

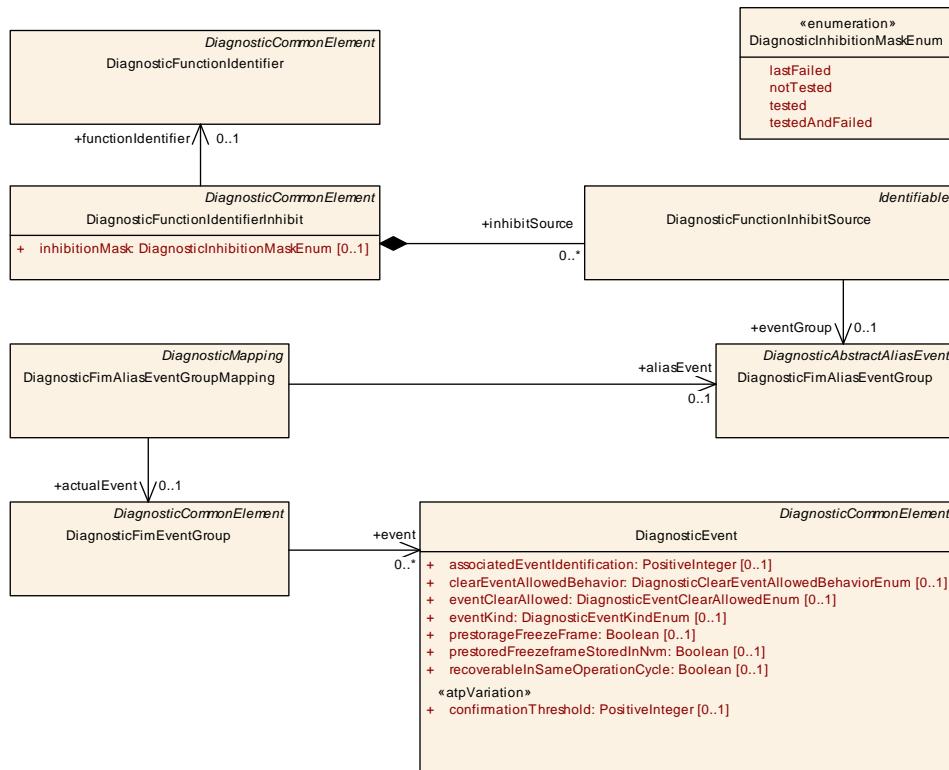


Figure 7.3: Inhibition of event groups in Fim for diagnostics configuration

7.6 Mapping of Function Identifiers to the corresponding Monitors

Beside the ability to model a function inhibition itself, it is equally important that this inhibition can be connected to the applicable monitors.

This relation can be expressed by means of the `DiagnosticFimFunctionMapping`. The details are sketched in Figure 7.4.

[[TPS_DEXT_01102](#)] Semantics of `DiagnosticFimFunctionMapping` [The meta-class `DiagnosticFimFunctionMapping` represents the ability to map a `DiagnosticFunctionIdentifier` to a `SwcServiceDependency` that addresses function inhibition.] ([RS_DEXT_00063](#))

[constr_1454] **DiagnosticFimFunctionMapping** shall only reference a **SwcServiceDependency** that aggregates **FunctionInhibitionNeeds** [A DiagnosticFimFunctionMapping shall only reference a SwcServiceDependency that aggregates FunctionInhibitionNeeds in the role serviceNeeds.]()

The modeling of this mapping is closely related to the existing modeling of mappings that involve **SwcServiceDependency** in the context of the diagnostic extract.

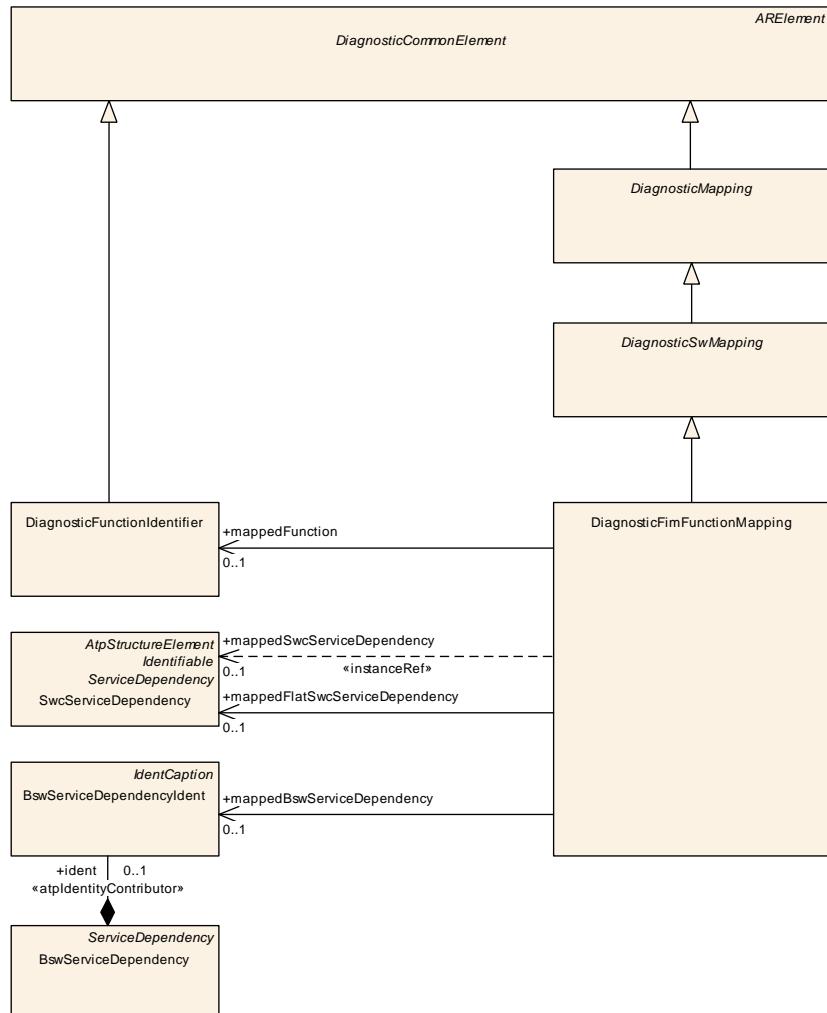


Figure 7.4: Mapping of function identifiers to the corresponding monitors

Class	DiagnosticFimFunctionMapping
Package	M2::AUTOSARTemplates::DiagnosticExtract::ServiceMapping
Note	This meta-class represents the ability to define a mapping between a function identifier (FID) and the corresponding SwcServiceDependency in the application software resp. basic software. Tags: atp.recommendedPackage=DiagnosticFimFunctionMappings
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>DiagnosticCommonElement</i> , <i>DiagnosticMapping</i> , <i>DiagnosticSwMapping</i> , <i>Identifiable</i> , <i>MultilanguageReferable</i> , <i>PackageableElement</i> , <i>Referable</i>





Class	DiagnosticFimFunctionMapping			
Attribute	Type	Mult.	Kind	Note
mappedBswServiceDependency	BswServiceDependencyIdent	0..1	ref	This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.
mappedFlatSwcServiceDependency	SwcServiceDependency	0..1	ref	This represents the ability to refer to an AtomicSwComponentType that is available without the definition of how it will be embedded into the component hierarchy.
mappedFunction	DiagnosticFunctionIdentifier	0..1	ref	This represents the mapped FID.
mappedSwcServiceDependency	SwcServiceDependency	0..1	iref	This represents the ability to point into the component hierarchy (under possible consideration of the root SoftwareComposition). InstanceRef implemented by: SwcServiceDependency InSystemInstanceRef

Table 7.12: DiagnosticFimFunctionMapping

Class	FunctionInhibitionNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs on the configuration of the Function Inhibition Manager for one Function Identifier (FID). This class currently contains no attributes. Its name can be regarded as a symbol identifying the FID from the viewpoint of the component or module which owns this class.			
Base	ARObject, Identifiable, MultilanguageReferrable, Referrable, ServiceNeeds			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table 7.13: FunctionInhibitionNeeds

8 Diagnostics on J1939

8.1 Introduction

Diagnostics on J1939 is to some extent similar to the “rest of the world”. In other words, J1939 uses a Dcm and a Dem similarly as other communication networks do.

On the other hand, there are significant differences between J1939 and the “rest of the world” that justify the creation of a separate chapter that focuses entirely on how a diagnostic extract for J1939 shall look like.

That said, a support for Dcm-related model elements for J1939 is mainly happening in the domain of the AUTOSAR System Template [6] rather than in the scope of this document.

The actual configuration of services supported by the J1939Dcm is done by assigning DMx messages in the System Description.

The mapping of the [J1939DcmIPdu](#)s to the diagnostic services of J1939 Dcm happens during derivation to EcuC.

In the following sections this document focuses on explaining the modeling with respect to the Dem.

8.2 Suspect Parameter Number

In the J1939 terminology, a *Suspect Parameter Number* represents a signal identifier. The numerical value of this signal identifier is stored in the attribute [DiagnosticJ1939Spn.spn](#).

Conceptually, the *Suspect Parameter Number* binds to the [SystemSignal](#), i.e. by attaching a *Suspect Parameter Number* to a [SystemSignal](#) a J1939 signal is created.

At the first sight, it may seem like a good idea to attach the spn attribute to the [SystemSignal](#) itself. However, this would place a very specific J1939-related model semantics in a very prominent place.

This just doesn't seem right and thanks to the existence of meta-class [DiagnosticJ1939SpnMapping](#) it is possible to “inject” the J1939 signal identifier into a [SystemSignal](#) without actually touching the [SystemSignal](#).

[TPS_DEXT_01103] Semantics of meta-class [DiagnosticJ1939SpnMapping](#)
[The [DiagnosticJ1939SpnMapping](#) has the ability to associate a [DiagnosticJ1939Spn](#) with a [SystemSignal](#). By this means it is possible to express that a given [SystemSignal](#) is taken to transport a J1939 *Suspect Parameter Number*.]
([RS_DEXT_00064](#))

Please note that the modeling of the [DiagnosticJ1939SpnMapping](#) also implies that the same SPN can be sent by different [J1939NmNode](#)s. This ability is positively supported.

Class	DiagnosticJ1939Spn			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939			
Note	This meta-class represents the ability to model a J1939 Suspect Parameter Number (SPN). Tags: atp.recommendedPackage=DiagnosticJ1939Spns			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
spn	PositiveInteger	0..1	attr	This attribute represents the concrete numerical identification for the enclosing SPN.

Table 8.1: DiagnosticJ1939Spn

[constr_1856] Existence of attribute [DiagnosticJ1939Spn.spn](#) [For each [DiagnosticJ1939Spn](#), attribute [spn](#) shall exist **at the time when the DEXT is complete.**.]

()

8.3 J1939Dcm-related Modeling

The modeling of the J1939Dcm-related configuration within the Diagnostic Extract extends to the definition of a new attribute of meta-class [J1939Cluster](#). The latter provides an attribute named [networkId](#). For more information, please refer to [6].

The actual configuration of the services supported by J1939Dcm is done by assigning DMx messages in the System Description.

8.4 Dem-related Modeling

The modeling of Dem-related support for J1939 is centered around the [DiagnosticJ1939Node](#). This meta-class literally acts as a sort of “inverted”¹ hub for all the Dem-related model elements. The [DiagnosticJ1939Node](#) represents a specific function, or in terms of the J1939 terminology, a *Controller Application*.

This aspect is stressed in Figure 8.1.

Since, according to the J1939 concept, each *controller application* represents an independent entity in terms of network management, the following constraint applies:

[constr_1455] Relation of [DiagnosticJ1939Node](#) to [J1939NmNode](#) [Each [J1939NmNode](#) shall only be referenced in the role [nmNode](#) by a single [DiagnosticJ1939Node](#).]

¹Meaning: several meta-classes are referencing the [DiagnosticJ1939Node](#).

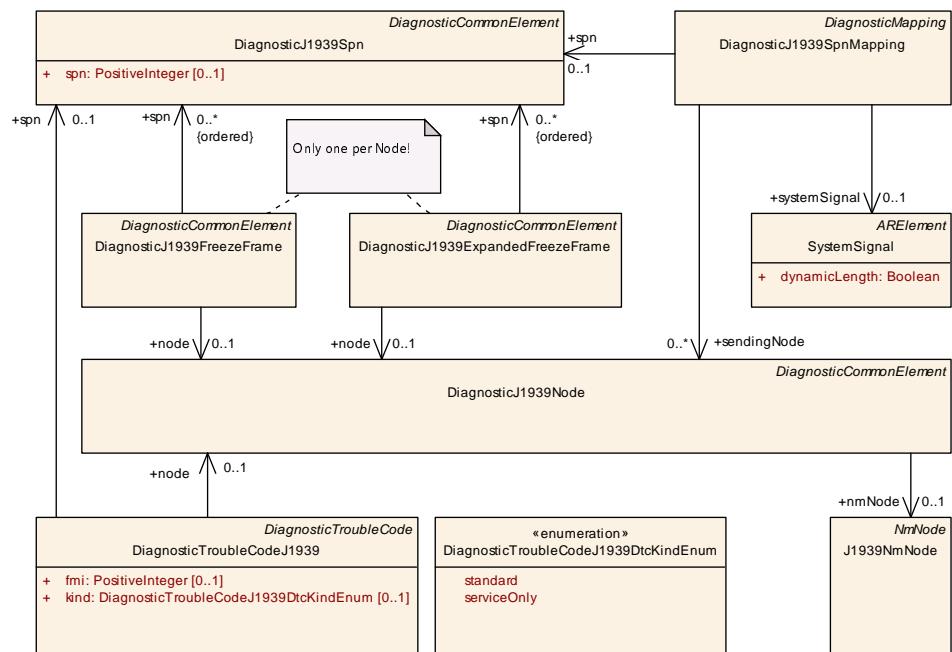


Figure 8.1: Big Picture of J1939 diagnostics configuration

J1939 supports the capturing of information similar to the definition of [DiagnosticFreezeFrame](#), as explained in chapter [6.5](#). In the case of J1939, however, two different kinds of freeze frames can be defined:

[TPS_DEXT_01104] Difference between DiagnosticJ1939FreezeFrame and DiagnosticJ1939ExpandedFreezeFrame [A DiagnosticJ1939FreezeFrame is transmitted via J1939 DM04 while a DiagnosticJ1939ExpandedFreezeFrame is transmitted via J1939 DM24/DM25.] ([RS_DEXT_00065](#))

[TPS_DEXT_01105] Relation of DiagnosticJ1939Spn to DiagnosticJ1939FreezeFrame and DiagnosticJ1939ExpandedFreezeFrame [It is possible that a given DiagnosticJ1939Spn is referenced by both a DiagnosticJ1939FreezeFrame and a DiagnosticJ1939ExpandedFreezeFrame.

In other words, the *Suspect Parameter Number* can be part of a normal freeze frame and, at the same time, an expanded freeze frame. | ([RS_DEXT_00065](#))

Class	DiagnosticJ1939FreezeFrame			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939			
Note	This meta-class represents the ability to model a J1939 Freeze Frame. Tags: atp.recommendedPackage=DiagnosticJ1939FreezeFrames			
Base	<i>ARElement, AROObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
node	DiagnosticJ1939Node	0..1	ref	This represents the DiagnosticJ1939Node to which the J1939 freeze frame is associated.



Class	DiagnosticJ1939FreezeFrame		
spn (ordered)	DiagnosticJ1939Spn	*	ref

Table 8.2: DiagnosticJ1939FreezeFrame

Class	DiagnosticJ1939ExpandedFreezeFrame		
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939		
Note	This meta-class represents the ability to model an expanded J1939 Freeze Frame. Tags: atp.recommendedPackage=DiagnosticJ1939ExpandedFreezeFrames		
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>		
Attribute	Type	Mult.	Kind
node	DiagnosticJ1939Node	0..1	ref
spn (ordered)	DiagnosticJ1939Spn	*	ref

Table 8.3: DiagnosticJ1939ExpandedFreezeFrame

Enumeration	DiagnosticTroubleCodeJ1939DtcKindEnum
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode
Note	This meta-class represents the ability to further specify a J1939 DTC in terms of its semantics.
Literal	Description
serviceOnly	this represents a DTC that is only relevant for service in a garage, reported by e.g. DM53. Tags: atp.EnumerationLiteralIndex=0
standard	This represents a non-specific DTC reported by e.g. DM1. Tags: atp.EnumerationLiteralIndex=1

Table 8.4: DiagnosticTroubleCodeJ1939DtcKindEnum

[TPS_DEXT_01106] Relation of Controller Application to SPN [It is technically possible that several *Controller Applications*, formally represented by the meta-class [DiagnosticJ1939Node](#), can send the same *Suspect Parameter Number*.

In response to this specific characteristic of the J1939 approach, the multiplicity of the reference [DiagnosticJ1939SpnMapping.sendingNode](#) has been set to 0..*.] ([RS_DEXT_00064](#))

Class	DiagnosticJ1939SpnMapping
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939
Note	This meta-class represents the ability to define a mapping between an SPN and a SystemSignal. The existence of a mapping means that neither the SPN nor the SystemSignal need to be updated if the relation between the two changes. Tags: atp.recommendedPackage=DiagnosticJ1939SpnMappings





Class	DiagnosticJ1939SpnMapping			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticMapping, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
sendingNode	DiagnosticJ1939Node	*	ref	This additional reference has a supporting role in that it identifies all sending nodes of a given SPN. It is positively possible that a given SPN is sent by more than one node. Even though the reference targets the DiagnosticJ1939Node, the semantics of the reference is bound to the J1939NmNode that is in turn referenced by the DiagnosticJ1939Node.
spn	DiagnosticJ1939Spn	0..1	ref	This reference goes to the SPN that shall be associated with a SystemSignal.
systemSignal	SystemSignal	0..1	ref	This reference goes to the SystemSignal that shall be associated with an SPN.

Table 8.5: DiagnosticJ1939SpnMapping

Class	DiagnosticJ1939Node			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939			
Note	This meta-class represents the diagnostic configuration of a J1939 Nm node, which in turn represents a "virtual Ecu" on the J1939 communication bus. Tags: atp.recommendedPackage=DiagnosticJ1939Nodes			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
nmNode	J1939NmNode	0..1	ref	This represents the reference to the "virtual Ecu" to which the enclosing DiagnosticJ1939Node is associated.

Table 8.6: DiagnosticJ1939Node

[constr_1456] Valid interval for attribute *DiagnosticTroubleCodeJ1939.fmi*
 [The value of the attribute *DiagnosticTroubleCodeJ1939.fmi* shall be in the interval 0..31.]()

Please note that the rationale for the existence of [constr_1456] as well as the meaning of the individual values of the attribute *fmi* can be found in the respective SAE J1939 [22] specification.

Class	DiagnosticTroubleCodeJ1939			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::DiagnosticTroubleCode			
Note	This meta-class represents the ability to model specific trouble-code related properties for J1939. Tags: atp.recommendedPackage=DiagnosticTroubleCodes			
Base	<i>ARElement, ARObject, CollectableElement, DiagnosticCommonElement, DiagnosticTroubleCode, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dtcProps	DiagnosticTroubleCodeProps	0..1	ref	Defined properties associated with the J1939 DTC.





Class	DiagnosticTroubleCodeJ1939			
fmi	PositiveInteger	0..1	attr	This attribute represents the behavior of the Failure Mode Indicator.
kind	DiagnosticTroubleCodeJ1939DtcKindEnum	0..1	attr	This attribute further specifies the DTC in terms of its semantics.
node	DiagnosticJ1939Node	0..1	ref	This represents the related DiagnosticJ1939Node.
spn	DiagnosticJ1939Spn	0..1	ref	This represents the related SPN.

Table 8.7: DiagnosticTroubleCodeJ1939

[constr_1780] Existence of attribute `DiagnosticTroubleCodeJ1939.fmi` [For each `DiagnosticTroubleCodeJ1939`, attribute `fmi` shall exist **at the time when the DEXT is complete.**.]()

[constr_1781] Existence of attribute `DiagnosticTroubleCodeJ1939.spn` [For each `DiagnosticTroubleCodeJ1939`, attribute `spn` shall exist **at the time when the DEXT is complete.**.]()

[TPS_DEXT_01107] Definition of service-only DTC [It is possible to specify whether given DTCs on J1939 are only relevant for a service session in a garage or workshop. The common property of service-only DTCs is that they shall be located in a memory section that is exclusively used by service-only DTCs.] ([RS_DEXT_00067](#))

The statement made by [\[TPS_DEXT_01107\]](#) needs to be secured by two constraints:

[constr_1457] Service-only DTCs shall refer to a common memory section [All `DiagnosticTroubleCodeJ1939` with attribute `kind` set to the value `serviceOnly` that reference the same `DiagnosticJ1939Node` shall also reference the same `DiagnosticTroubleCodeProps.memoryDestination`.]()

[constr_1458] Reference to `DiagnosticMemoryDestination` [A `DiagnosticMemoryDestination` that is referenced by a `DiagnosticTroubleCodeJ1939.dtcProps.memoryDestination` where the value of attribute `DiagnosticTroubleCodeJ1939.kind` is set to `serviceOnly` shall **not be referenced by any other `DiagnosticTroubleCodeJ1939` where attribute `kind` is set to any other value than `serviceOnly`.**.]()

8.5 Mapping between Software-Components and Controller Applications

Another aspect of the modeling of J1939 diagnostics is that a mapping between the `DiagnosticJ1939Node` (which formally represents a *Controller Application*) and the AUTOSAR way of specifying a “function” (by means of the meta-class `SwComponentPrototype`) is required.

This leads to the definition of the `DiagnosticJ1939SwMapping`.

[TPS_DEXT_01108] Purpose of the [DiagnosticJ1939SwMapping](#) [The purpose of the [DiagnosticJ1939SwMapping](#) is to associate a [SwComponentPrototype](#) with a [DiagnosticJ1939Node](#). By this means a concrete functionality is mapped to the abstract J1939 *Controller Application.*] ([RS_DEXT_00066](#))

Please note that the basis for this mapping is the existence of a [CompositionSwComponentType](#) rather than a [System](#). The mapping can therefore (and this is the main motivation for this kind of modeling) be done independently of the deployment to a concrete project.

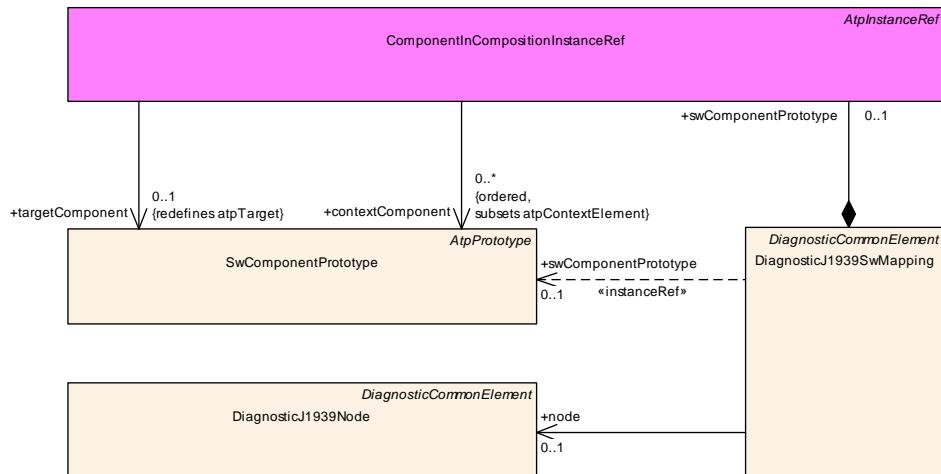


Figure 8.2: Mapping between Software-Components and Controller Applications

Class	DiagnosticJ1939SwMapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::SwMapping			
Note	This meta-class represents the ability to map a piece of application software to a J1939DiagnosticNode. By this means the diagnostic configuration can be associated with the application software. Tags: atp.recommendedPackage=DiagnosticJ1939SwMappings			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
node	DiagnosticJ1939Node	0..1	ref	This represents the mapped DiagnosticJ1939Node.
swComponentPrototype	SwComponentPrototype	0..1	iref	This represents the mapped SwComponentPrototype. InstanceRef implemented by: ComponentInCompositionInstanceRef

Table 8.8: **DiagnosticJ1939SwMapping**

8.6 Mapping between DiagnosticEvent and J1939 DTC

[TPS_DEXT_01145] Semantics of meta-class [DiagnosticEventToTroubleCodeJ1939Mapping](#) [The [DiagnosticEventToTroubleCodeJ1939Mapping](#) is used to assign one (1:1) or multiple (n:1) [DiagnosticEvents](#) to a [DiagnosticTroubleCodeJ1939](#).

In case of an n:1 mapping, multiple instances of [DiagnosticEventToTroubleCodeJ1939Mapping](#) with the same reference of role [troubleCodeJ1939](#) but different references of role [diagnosticEvent](#) have to be defined.] ([RS_DEXT_00067](#))

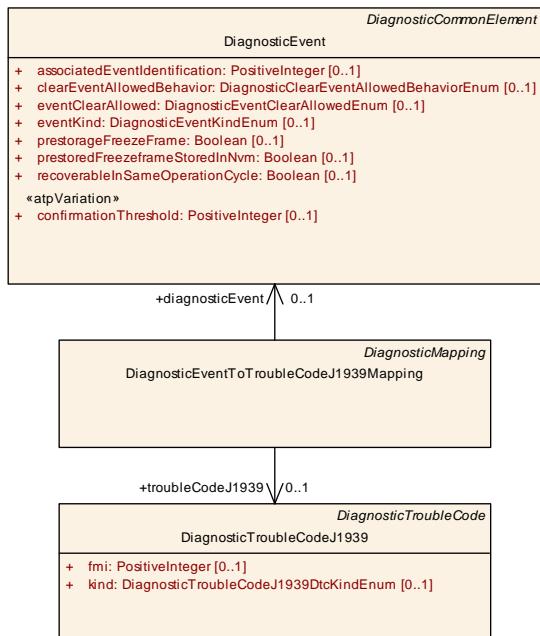


Figure 8.3: Mapping between [DiagnosticEvent](#) and [DiagnosticTroubleCodeJ1939](#)

Class	DiagnosticEventToTroubleCodeJ1939Mapping			
Package	M2::AUTOSARTemplates::DiagnosticExtract::Dem::J1939			
Note	By means of this meta-class it is possible to associate a DiagnosticEvent to a DiagnosticTroubleCode J1939. Tags: atp.recommendedPackage=DiagnosticMappings			
Base	ARElement , ARObject , CollectableElement , DiagnosticCommonElement , DiagnosticMapping , Identifiable , MultilanguageReferrable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
diagnosticEvent	DiagnosticEvent	0..1	ref	Reference to a DiagnosticEvent to which a J1939 Diagnostic Trouble Code is assigned.
troubleCode J1939	DiagnosticTroubleCodeJ1939	0..1	ref	Reference to a J1939 Diagnostic Trouble Code to which a DiagnosticEvent is assigned.

Table 8.9: [DiagnosticEventToTroubleCodeJ1939Mapping](#)

[constr_1857] Existence of the reference [DiagnosticEventToTroubleCodeJ1939Mapping.diagnosticEvent](#) [For each [DiagnosticEventToTroubleCodeJ1939Mapping](#), reference [diagnosticEvent](#) shall exist **at the time when the DEXT is complete.**.] ()

[constr_1858] Existence of the attribute [DiagnosticEventToTroubleCodeJ1939Mapping.troubleCodeJ1939](#) [For each [DiagnosticEventToTroubleCodeJ1939Mapping](#), attribute [troubleCodeJ1939](#) shall exist **at the time when the DEXT is complete.**.] ()

A Mentioned Class Tables

For the sake of completeness, this chapter contains a set of class tables representing meta-classes mentioned in the context of this document but which are not contained directly in the scope of describing specific meta-model semantics.

Class	ARElement (abstract)			
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::ARPackage			
Note	An element that can be defined stand-alone, i.e. without being part of another element (except for packages of course).			
Base	<i>ARObject, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	AclObjectSet, AclOperation, AclPermission, AclRole, AliasNameSet, ApplicationPartition, <i>AutosarDataType, BaseType, BlueprintMappingSet, BswEntryRelationshipSet, BswModuleDescription, BswModuleEntry, BuildActionManifest, CalibrationParameterValueSet, ClientIdDefinitionSet, ClientServerInterfaceToBswModuleEntryBlueprintMapping, Collection, CompuMethod, ConsistencyNeedsBlueprintSet, ConstantSpecification, ConstantSpecificationMappingSet, CpSoftwareCluster, CpSoftwareClusterBinaryManifestDescriptor, CpSoftwareClusterMappingSet, CpSoftwareClusterResourcePool, CryptoServiceCertificate, CryptoServiceKey, CryptoServicePrimitive, CryptoServiceQueue, DataConstr, DataExchangePoint, DataTransformationSet, DataTypeMappingSet, DiagnosticCommonElement, DiagnosticConnection, DiagnosticContributionSet, Documentation, E2EProfileCompatibilityProps, EcucDefinitionCollection, EcucDestinationUriDefSet, EcucModuleConfigurationValues, EcucModuleDef, EcucValueCollection, EndToEndProtectionSet, EthIpProps, EthTcplPlcmpProps, EthTcplPProps, EvaluatedVariantSet, FMFeature, FMFeatureMap, FMFeatureModel, FMFeatureSelectionSet, FlatMap, GeneralPurposeConnection, HwCategory, HwElement, HwType, IPSecConfigProps, IPv6ExtHeaderFilterSet, IdsCommonElement, IdsDesign, Implementation, InterpolationRoutineMappingSet, J1939ControllerApplication, KeywordSet, LifeCycleInfoSet, LifeCycleStateDefinitionGroup, McFunction, McGroup, ModeDeclarationGroup, ModeDeclarationMappingSet, PhysicalDimension, PhysicalDimensionMappingSet, PortInterface, PortInterfaceMappingSet, PortPrototypeBlueprint, PostBuildVariantCriterion, PostBuildVariantCriterionValueSet, PredefinedVariant, RapidPrototypingScenario, SdgDef, SignalServiceTranslationPropsSet, SomeipSdClientEventGroupTimingConfig, SomeipSdClientServiceInstanceConfig, SomeipSdServerEventGroupTimingConfig, SomeipSdServerServiceInstanceConfig, SwAddrMethod, SwAxisType, SwComponentType, SwRecordLayout, SwSystemconst, SwSystemconstantValueSet, SwcBswMapping, System, SystemSignal, SystemSignalGroup, TDCpSoftwareClusterMappingSet, TcpOptionFilterSet, TimingExtension, TlvDataIdDefinitionSet, TransformationPropsSet, Unit, UnitGroup, ViewMapSet</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.1: ARElement

Class	ARPackage			
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::ARPackage			
Note	AUTOSAR package, allowing to create top level packages to structure the contained ARElements. ARPackages are open sets. This means that in a file based description system multiple files can be used to partially describe the contents of a package. This is an extended version of MSR's SW-SYSTEM.			
Base	<i>ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note





Class	ARPackage	*	aggr	
arPackage	ARPackage	*	aggr	<p>This represents a sub package within an ARPackage, thus allowing for an unlimited package hierarchy.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=arPackage.shortName, arPackage.variation Point.shortLabel vh.latestBindingTime=blueprintDerivationTime xml.sequenceOffset=30 </p>
element	PackageableElement	*	aggr	<p>Elements that are part of this package</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=element.shortName, element.variation Point.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=20 </p>
referenceBase	ReferenceBase	*	aggr	<p>This denotes the reference bases for the package. This is the basis for all relative references within the package. The base needs to be selected according to the base attribute within the references.</p> <p>Stereotypes: atpSplittable</p> <p>Tags: atp.Splitkey=referenceBase.shortLabel xml.sequenceOffset=10 </p>

Table A.2: ARPackage

Class	ApplicationArrayDataType			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
Note	An application data type which is an array, each element is of the same application data type. Tags: atp.recommendedPackage=ApplicationDataTypes			
Base	<i>ARElement, ARObject, ApplicationCompositeDataType, ApplicationDataType, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, AutosarDataType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dynamicArraySizeProfile	String	0..1	attr	Specifies the profile which the array will follow if it is a variable size array.
element	ApplicationArrayElement	0..1	aggr	This association implements the concept of an array element. That is, in some cases it is necessary to be able to identify single array elements, e.g. as input values for an interpolation routine.

Table A.3: ApplicationArrayDataType

Class	ApplicationDataType (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::Datatypes			
Note	<p>ApplicationDataType defines a data type from the application point of view. Especially it should be used whenever something "physical" is at stake.</p> <p>An ApplicationDataType represents a set of values as seen in the application model, such as measurement units. It does not consider implementation details such as bit-size, endianess, etc.</p> <p>It should be possible to model the application level aspects of a VFB system by using ApplicationData Types only.</p>			





Class	ApplicationDataType (abstract)			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, AutosarDataType, CollectableElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable</i>			
Subclasses	<i>ApplicationCompositeDataType, ApplicationPrimitiveDataType</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.4: ApplicationDataType

Class	AtomicSwComponentType (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	An atomic software component is atomic in the sense that it cannot be further decomposed and distributed across multiple ECUs.			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferable, PackageableElement, Referrable, SwComponentType</i>			
Subclasses	<i>ApplicationSwComponentType, ComplexDeviceDriverSwComponentType, EcuAbstractionSwComponentType, NvBlockSwComponentType, SensorActuatorSwComponentType, ServiceProxySwComponentType, ServiceSwComponentType</i>			
Attribute	Type	Mult.	Kind	Note
internalBehavior	SwInternalBehavior	0..1	aggr	<p>The SwInternalBehaviors owned by an AtomicSwComponentType can be located in a different physical file. Therefore the aggregation is <>atpSplittable>>.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=internalBehavior.shortName, internalBehavior.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
symbolProps	SymbolProps	0..1	aggr	<p>This represents the SymbolProps for the AtomicSwComponentType.</p> <p>Stereotypes: atpSplittable</p> <p>Tags: atp.Splitkey=symbolProps.shortName</p>

Table A.5: AtomicSwComponentType

Class	AtpInstanceRef (abstract)			
Package	M2::AUTOSARTemplates::GenericStructure::AbstractStructure			
Note	<p>An M0 instance of a classifier may be represented as a tree rooted at that instance, where under each node come the sub-trees representing the instances which act as features under that node.</p> <p>An instance ref specifies a navigation path from any M0 tree-instance of the base (which is a classifier) to a leaf (which is an instance of the target).</p>			
Base	ARObject			
Subclasses	<i>AnyInstanceRef, ApplicationCompositeElementInPortInterfaceInstanceRef, ComponentInCompositionInstanceRef, ComponentInSystemInstanceRef, DataPrototypeInPortInterfaceInstanceRef, DataPrototypeInSystemInstanceRef, InnerDataPrototypeGroupInCompositionInstanceRef, InnerPortGroupInCompositionInstanceRef, InnerRunnableEntityGroupInCompositionInstanceRef, InstanceEventInCompositionInstanceRef, ModeDeclarationGroupPrototypeInSystemInstanceRef, ModeGroupInAtomicSwInstanceRef, ModelInBswModuleDescriptionInstanceRef, ModelInSwcInstanceRef, OperationArgumentInComponentInstanceRef, OperationInAtomicSwcInstanceRef, OperationInSystemInstanceRef, PModelInSystemInstanceRef, ParameterDataPrototypeInSystemInstanceRef, ParameterInAtomicSwTypeInstanceRef, PortGroupInSystemInstanceRef, PortInCompositionTypeInstanceRef, RModelIn</i>			





Class	AtpInstanceRef (abstract)			
AtomicSwcInstanceRef, RteEventInEcuInstanceRef, RunnableEntityInCompositionInstanceRef, SwcServiceDependencyInSystemInstanceRef , TriggerInAtomicSwcInstanceRef, TriggerInSystemInstanceRef, VariableAccessInEcuInstanceRef, VariableDataPrototypeInCompositionInstanceRef, VariableDataPrototypeInSystemInstanceRef, VariableInAtomicSWCTypeInstanceRef, VariableInAtomicSwcInstanceRef, VariableInComponentInstanceRef				
Attribute	Type	Mult.	Kind	Note
atpBase	AtpClassifier	1	ref	This is the base from which the navigation path starts. Stereotypes: atpAbstract; atpDerived
atpContext Element (ordered)	AtpPrototype	*	ref	This is one particular step in the navigation path. Stereotypes: atpAbstract
atpTarget	AtpFeature	1	ref	This is the target of the instance ref. In other words it is the terminal of the navigation path. Stereotypes: atpAbstract

Table A.6: AtpInstanceRef

Class	BaseType (abstract)			
Package	M2::MSR::AsamHdo::BaseTypes			
Note	This abstract meta-class represents the ability to specify a platform dependant base type.			
Base	ARElement , ARObject , CollectableElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			
Subclasses	SwBaseType			
Attribute	Type	Mult.	Kind	Note
baseType Definition	BaseTypeDefinition	1	aggr	<p>This is the actual definition of the base type.</p> <p>Tags:</p> <ul style="list-style-type: none"> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=20 xml.typeElement=false xml.typeWrapperElement=false

Table A.7: BaseType

Class	BaseTypeDirectDefinition			
Package	M2::MSR::AsamHdo::BaseTypes			
Note	This BaseType is defined directly (as opposite to a derived BaseType)			
Base	ARObject , BaseTypeDefinition			
Attribute	Type	Mult.	Kind	Note
baseType Encoding	BaseTypeEncodingString	0..1	attr	<p>This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.</p> <p>Tags:xml.sequenceOffset=90</p>
baseTypeSize	PositiveInteger	0..1	attr	<p>Describes the length of the data type specified in the container in bits.</p> <p>Tags:xml.sequenceOffset=70</p>
byteOrder	ByteOrderEnum	0..1	attr	<p>This attribute specifies the byte order of the base type.</p> <p>Tags:xml.sequenceOffset=110</p>





Class	BaseTypeDirectDefinition			
memAlignment	PositiveInteger	0..1	attr	<p>This attribute describes the alignment of the memory object in bits. E.g. "8" specifies, that the object in question is aligned to a byte while "32" specifies that it is aligned four byte. If the value is set to "0" the meaning shall be interpreted as "unspecified".</p> <p>Tags:xml.sequenceOffset=100</p>
native Declaration	NativeDeclarationString	0..1	attr	<p>This attribute describes the declaration of such a base type in the native programming language, primarily in the Programming language C. This can then be used by a code generator to include the necessary declarations into a header file. For example</p> <p>BaseType with shortName: "MyUnsignedInt" native Declaration: "unsigned short"</p> <p>Results in</p> <pre>typedef unsigned short MyUnsignedInt;</pre> <p>If the attribute is not defined the referring Implementation DataTypes will not be generated as a typedef by RTE.</p> <p>If a nativeDeclaration type is given it shall fulfill the characteristic given by basetypeEncoding and baseType Size.</p> <p>This is required to ensure the consistent handling and interpretation by software components, RTE, COM and MCM systems.</p> <p>Tags:xml.sequenceOffset=120</p>

Table A.8: BaseTypeDirectDefinition

Class	BswModuleDescription			
Package	M2::AUTOSARTemplates::BswModuleTemplate::BswOverview			
Note	Root element for the description of a single BSW module or BSW cluster. In case it describes a BSW module, the short name of this element equals the name of the BSW module. Tags: atp.recommendedPackage=BswModuleDescriptions			
Base	ARElement , ARObject , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpFeature , AtpStructureElement , CollectableElement , Identifiable , MultilanguageReferable , PackageableElement , Referrable			
Attribute	Type	Mult.	Kind	Note
bswModule Dependency	BswModuleDependency	*	aggr	<p>Describes the dependency to another BSW module.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=bswModuleDependency.shortName, bsw ModuleDependency.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=20</p>
bswModule Documentation	SwComponent Documentation	0..1	aggr	<p>This adds a documentation to the BSW module.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=bswModuleDocumentation, bswModule Documentation.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=6</p>





Class	BswModuleDescription			
expectedEntry	BswModuleEntry	*	ref	Indicates an entry which is required by this module. Replacement of outgoingCallback / requiredEntry. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=expectedEntry.bswModuleEntry, expectedEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
implementedEntry	BswModuleEntry	*	ref	Specifies an entry provided by this module which can be called by other modules. This includes "main" functions, interrupt routines, and callbacks. Replacement of providedEntry / expectedCallback. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=implementedEntry.bswModuleEntry, implementedEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
internalBehavior	BswInternalBehavior	*	aggr	The various BswInternalBehaviors associated with a BswModuleDescription can be distributed over several physical files. Therefore the aggregation is <>atpSplittable><. Stereotypes: atpSplittable Tags: atp.Splitkey=internalBehavior.shortName xml.sequenceOffset=65
moduleId	PositiveInteger	0..1	attr	Refers to the BSW Module Identifier defined by the AUTOSAR standard. For non-standardized modules, a proprietary identifier can be optionally chosen. Tags: xml.sequenceOffset=5
providedClientServerEntry	BswModuleClientServerEntry	*	aggr	Specifies that this module provides a client server entry which can be called from another partition or core. This entry is declared locally to this context and will be connected to the requiredClientServerEntry of another or the same module via the configuration of the BSW Scheduler. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=providedClientServerEntry.shortName, providedClientServerEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=45
providedData	VariableDataPrototype	*	aggr	Specifies a data prototype provided by this module in order to be read from another partition or core. The providedData is declared locally to this context and will be connected to the requiredData of another or the same module via the configuration of the BSW Scheduler. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=providedData.shortName, providedData.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=55





Class	BswModuleDescription			
providedMode Group	ModeDeclarationGroup Prototype	*	aggr	<p>A set of modes which is owned and provided by this module or cluster. It can be connected to the required ModeGroups of other modules or clusters via the configuration of the BswScheduler. It can also be synchronized with modes provided via ports by an associated ServiceSwComponentType, EcuAbstraction SwComponentType or ComplexDeviceDriverSw ComponentType.</p> <p>Stereotypes: atpSplitable; atpVariation Tags: atp.Splitkey=providedModeGroup.shortName, provided ModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=25</p>
releasedTrigger	Trigger	*	aggr	<p>A Trigger released by this module or cluster. It can be connected to the requiredTriggers of other modules or clusters via the configuration of the BswScheduler. It can also be synchronized with Triggers provided via ports by an associated ServiceSwComponentType, Ecu AbstractionSwComponentType or ComplexDeviceDriver SwComponentType.</p> <p>Stereotypes: atpSplitable; atpVariation Tags: atp.Splitkey=releasedTrigger.shortName, released Trigger.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=35</p>
requiredClient ServerEntry	BswModuleClientServer Entry	*	aggr	<p>Specifies that this module requires a client server entry which can be implemented on another partition or core. This entry is declared locally to this context and will be connected to the providedClientServerEntry of another or the same module via the configuration of the BSW Scheduler.</p> <p>Stereotypes: atpSplitable; atpVariation Tags: atp.Splitkey=requiredClientServerEntry.shortName, requiredClientServerEntry.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=50</p>
requiredData	VariableDataPrototype	*	aggr	<p>Specifies a data prototype required by this module in order to be provided from another partition or core. The required Data is declared locally to this context and will be connected to the providedData of another or the same module via the configuration of the BswScheduler.</p> <p>Stereotypes: atpSplitable; atpVariation Tags: atp.Splitkey=requiredData.shortName, required Data.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=60</p>
requiredMode Group	ModeDeclarationGroup Prototype	*	aggr	<p>Specifies that this module or cluster depends on a certain mode group. The requiredModeGroup is local to this context and will be connected to the providedModeGroup of another module or cluster via the configuration of the BswScheduler.</p>





Class	BswModuleDescription			
	Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=requiredModeGroup.shortName, requiredModeGroup.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=30			
requiredTrigger	Trigger	*	aggr	<p>Specifies that this module or cluster reacts upon an external trigger. This requiredTrigger is declared locally to this context and will be connected to the providedTrigger of another module or cluster via the configuration of the BswScheduler.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=requiredTrigger.shortName, requiredTrigger.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=40</p>

Table A.9: BswModuleDescription

Class	CompositionSwComponentType			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Composition			
Note	A CompositionSwComponentType aggregates SwComponentPrototypes (that in turn are typed by SwComponentTypes) as well as SwConnectors for primarily connecting SwComponentPrototypes among each others and towards the surface of the CompositionSwComponentType. By this means hierarchical structures of software-components can be created. Tags: atp.recommendedPackage=SwComponentTypes			
Base	ARElement , ARObject , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpType , CollectableElement , Identifiable , MultilanguageReferable , PackageableElement , Referable , SwComponentType			
Attribute	Type	Mult.	Kind	Note
component	SwComponentPrototype	*	aggr	<p>The instantiated components that are part of this composition. The aggregation of SwComponentPrototype is subject to variability with the purpose to support the conditional existence of a SwComponentPrototype. Please be aware: if the conditional existence of SwComponentPrototypes is resolved post-build the deselected SwComponentPrototypes are still contained in the ECUs build but the instances are inactive in that they are not scheduled by the RTE.</p> <p>The aggregation is marked as atpSplittable in order to allow the addition of service components to the ECU extract during the ECU integration.</p> <p>The use case for having 0 components owned by the CompositionSwComponentType could be to deliver an empty CompositionSwComponentType to e.g. a supplier for filling the internal structure.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=component.shortName, component.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>





Class	CompositionSwComponentType			
connector	SwConnector	*	aggr	<p>SwConnectors have the principal ability to establish a connection among PortPrototypes. They can have many roles in the context of a CompositionSwComponentType. Details are refined by subclasses.</p> <p>The aggregation of SwConnectors is subject to variability with the purpose to support variant data flow.</p> <p>The aggregation is marked as atpSplittable in order to allow the extension of the ECU extract with AssemblySw Connectors between ApplicationSwComponentTypes and ServiceSwComponentTypes during the ECU integration.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=connector.shortName, connector.variation Point.shortLabel vh.latestBindingTime=postBuild</p>
constantValue Mapping	ConstantSpecification MappingSet	*	ref	<p>Reference to the ConstantSpecificationMapping to be applied for initValues of PPortComSpecs and RPortCom Spec.</p> <p>Stereotypes: atpSplittable Tags:atp.Splitkey=constantValueMapping</p>
dataType Mapping	DataTypeMappingSet	*	ref	<p>Reference to the DataTypeMapping to be applied for the used ApplicationDataTypes in PortInterfaces.</p> <p>Background: when developing subsystems it may happen that ApplicationDataTypes are used on the surface of CompositionSwComponentTypes. In this case it would be reasonable to be able to also provide the intended mapping to the ImplementationDataTypes. However, this mapping shall be informal and not technically binding for the implementors mainly because the RTE generator is not concerned about the CompositionSwComponent Types.</p> <p>Rationale: if the mapping of ApplicationDataTypes on the delegated and inner PortPrototype matches then the mapping to ImplementationDataTypes is not impacting compatibility.</p> <p>Stereotypes: atpSplittable Tags:atp.Splitkey=dataTypeMapping</p>
instantiation RTEEventProps	InstantiationRTEEvent Props	*	aggr	<p>This allows to define instantiation specific properties for RTE Events, in particular for instance specific scheduling.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=instantiationRTEEventProps.shortLabel, instantiationRTEEventProps.variationPoint.shortLabel vh.latestBindingTime=codeGenerationTime</p>

Table A.10: CompositionSwComponentType

Class	CompuMethod
Package	M2::MSR::AsamHdo::ComputationMethod





Class	CompuMethod			
Note	This meta-class represents the ability to express the relationship between a physical value and the mathematical representation. Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant. Tags: atp.recommendedPackage=CompuMethods			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
compulInternalToPhys	Compu	0..1	aggr	This specifies the computation from internal values to physical values. Tags: xml.sequenceOffset=80
compuPhysToInternal	Compu	0..1	aggr	This represents the computation from physical values to the internal values. Tags: xml.sequenceOffset=90
displayFormat	DisplayFormatString	0..1	attr	This property specifies, how the physical value shall be displayed e.g. in documents or measurement and calibration tools. Tags: xml.sequenceOffset=20
unit	Unit	0..1	ref	This is the physical unit of the Physical values for which the CompuMethod applies. Tags: xml.sequenceOffset=30

Table A.11: CompuMethod

Class	DataConstr			
Package	M2::MSR::AsamHdo::Constraints::GlobalConstraints			
Note	This meta-class represents the ability to specify constraints on data. Tags: atp.recommendedPackage=DataConstrs			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataConstrRule	DataConstrRule	*	aggr	This is one particular rule within the data constraints. Tags: xml.roleElement=true xml.roleWrapperElement=true xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

Table A.12: DataConstr

Class	DataInterface (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	The purpose of this meta-class is to act as an abstract base class for subclasses that share the semantics of being concerned about data (as opposed to e.g. operations).			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable</i>			





Class	DataInterface (abstract)			
Subclasses	NvDataInterface , ParameterInterface, SenderReceiverInterface			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.13: DataInterface

Class	DataPrototype (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
Note	Base class for prototypical roles of any data type.			
Base	ARObject, AtpFeature, AtpPrototype, Identifiable , MultilanguageReferrable , Referrable			
Subclasses	ApplicationCompositeElementDataPrototype , AutosarDataPrototype			
Attribute	Type	Mult.	Kind	Note
swDataDefProps	SwDataDefProps	0..1	aggr	This property allows to specify data definition properties which apply on data prototype level.

Table A.14: DataPrototype

Class	DiagnosticEventNeeds			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	Specifies the abstract needs on the configuration of the Diagnostic Event Manager for one diagnostic event. Its shortName can be regarded as a symbol identifying the diagnostic event from the viewpoint of the component or module which owns this element. In case the diagnostic event specifies a production error, the shortName shall be the name of the production error.			
Base	ARObject, DiagnosticCapabilityElement, Identifiable , MultilanguageReferrable , Referrable , Service Needs			
Attribute	Type	Mult.	Kind	Note
considerPtoStatus	Boolean	0..1	attr	PTO (Power Take Off) has an impact on the respective emission-related event (OBD). This information shall be provided by SW-C description in order to consider the PTO relevance e.g. for readiness (PID \$01) computation. For events with dtcKind set to 'nonEmmissionRelatedDtc' this attribute is typically false.
deferringFid	FunctionInhibitionNeeds	*	ref	This reference contains the link to a function identifier within the FiM which is used by the monitor before delivering a result.
diagEventDebounceAlgorithm	DiagEventDebounceAlgorithm	0..1	aggr	Specifies the abstract need on the Debounce Algorithm applied by the Diagnostic Event Manager.
dtcKind	DtcKindEnum	0..1	attr	This attribute indicates the kind of the diagnostic monitor according to the SWS Diagnostic Event Manger. This attribute applies for the UDS diagnostics use case.
obdDtcNumber	PositiveInteger	0..1	attr	This represents a reasonable Diagnostic Trouble Code. This allows to predefine the Diagnostic Trouble Code, e.g. if the a function developer has received a particular requirement from the OEM or from a standardization body. This attribute applies for the OBD diagnostics use case.





Class	DiagnosticEventNeeds			
prestoredFreezeFrameStoredInNvm	Boolean	0..1	attr	If the Event uses a prestored freeze-frame (using the operations PrestoreFreezeFrame and ClearPrestoredFreezeFrame of the service interface DiagnosticMonitor) this attribute indicates if the Event requires the data to be stored in non-volatile memory. TRUE = Dem shall store the prestored data in non-volatile memory, FALSE = Data can be lost at shutdown (not stored in Nvm).
reportBehavior	ReportBehaviorEnum	0..1	attr	This switch indicates whether or not the BSW module is allowed to report the related Events before Dem_Init().
udsDtcNumber	PositiveInteger	0..1	attr	This represents a reasonable Diagnostic Trouble Code. This allows to predefine the Diagnostic Trouble Code, e.g. if the a function developer has received a particular requirement from the OEM or from a standardization body. This attribute applies for the UDS diagnostics use case.
usesMonitorData	Boolean	0..1	attr	This attribute defines whether additional monitor data shall be added to the reporting of events.

Table A.15: DiagnosticEventNeeds

Class	EcuInstance			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreTopology			
Note	ECUInstances are used to define the ECUs used in the topology. The type of the ECU is defined by a reference to an ECU specified with the ECU resource description. Tags: atp.recommendedPackage=EcuInstances			
Base	ARObject, CollectableElement, FibexElement, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , Packageable Element, <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
associatedComIPduGroup	ISignalIPduGroup	*	ref	With this reference it is possible to identify which ISignalIPduGroups are applicable for which Communication Connector/ ECU. Only top level ISignalIPduGroups shall be referenced by an EcuInstance. If an ISignalIPduGroup contains other ISignalIPduGroups than these contained ISignalIPduGroups shall not be referenced by the EcuInstance. Contained ISignalIPduGroups are associated to an EcuInstance via the top level ISignalIPduGroup.
associatedConsumedProvidedServiceInstanceGroup	ConsumedProvidedServiceInstanceGroup	*	ref	With this reference it is possible to identify which ConsumedProvidedServiceInstanceGroups are applicable for which EcuInstance. Stereotypes: atpVariation Tags: vh.latestBindingTime=postBuild
associatedPduriPduGroup	PduriPduGroup	*	ref	With this reference it is possible to identify which PduriPdu Groups are applicable for which Communication Connector/ ECU.
clientIdRange	ClientIdRange	0..1	aggr	Restriction of the Client Identifier for this Ecu to an allowed range of numerical values. The Client Identifier of the transaction handle is generated by the client RTE for inter-Ecu Client/Server communication.
comConfigurationGwTimeBase	TimeValue	0..1	attr	The period between successive calls to Com_MainFunctionRouteSignals of the AUTOSAR COM module in seconds.





Class	EcuInstance			
com ConfigurationRx TimeBase	TimeValue	0..1	attr	The period between successive calls to Com_Main FunctionRx of the AUTOSAR COM module in seconds.
com ConfigurationTx TimeBase	TimeValue	0..1	attr	The period between successive calls to Com_Main FunctionTx of the AUTOSAR COM module in seconds.
comEnable MDTForCyclic Transmission	Boolean	0..1	attr	Enables for the Com module of this EcuInstance the minimum delay time monitoring for cyclic and repeated transmissions (TransmissionModeTiming has cyclic Timing assigned or eventControlledTiming with numberOf Repetitions > 0).
commController	Communication Controller	1..*	aggr	CommunicationControllers of the ECU. Stereotypes: atpVariation Tags: vh.latestBindingTime=postBuild
connector	Communication Connector	*	aggr	All channels controlled by a single controller. Stereotypes: atpVariation Tags: vh.latestBindingTime=postBuild
dltConfig	DltConfig	0..1	aggr	Describes the Dlt configuration on this EcuInstance.
dolpConfig	DolpConfig	0..1	aggr	Dolp configuration on this EcuInstance. Tags: atp.Status=draft
ethSwitchPort Group Derivation	Boolean	0..1	attr	Defines whether the derivation of SwitchPortGroups based on VLAN and/or CouplingPort.pncMapping shall be performed for this EcuInstance. If not defined the derivation shall not be done.
partition	EcuPartition	*	aggr	Optional definition of Partitions within an Ecu.
pncPrepare SleepTimer	TimeValue	0..1	attr	Time in seconds the PNC state machine shall wait in PNC_PREPARE_SLEEP.
pnc Synchronous Wakeup	Boolean	0..1	attr	If this parameter is available and set to true then all available PNCs will be woken up as soon as a channel wakeup occurs. This is ensured by adding all PNCs to all channel wakeup sources during upstream mapping.
pnResetTime	TimeValue	0..1	attr	Specifies the runtime of the reset timer in seconds. This reset time is valid for the reset of PN requests in the EIRA and in the ERA.
sleepMode Supported	Boolean	1	attr	Specifies whether the ECU instance may be put to a "low power mode" <ul style="list-style-type: none">• true: sleep mode is supported• false: sleep mode is not supported Note: This flag may only be set to "true" if the feature is supported by both hardware and basic software.
tcplplcmpProps	EthTcplplcmpProps	0..1	ref	EcuInstance specific ICMP (Internet Control Message Protocol) attributes
tcplpProps	EthTcplpProps	0..1	ref	EcuInstance specific Tcplp Stack attributes.
v2xSupported	V2xSupportEnum	0..1	attr	This attribute is used to control the existence of the V2X stack on the given EcuInstance.
wakeUpOver BusSupported	Boolean	1	attr	Driver support for wakeup over Bus.

Table A.16: EcuInstance

Class	ISignal			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreCommunication			
Note	<p>Signal of the Interaction Layer. The RTE supports a "signal fan-out" where the same System Signal is sent in different SignalIPdus to multiple receivers.</p> <p>To support the RTE "signal fan-out" each SignalIPdu contains ISignals. If the same System Signal is to be mapped into several SignalIPdus there is one ISignal needed for each ISignalToIPduMapping.</p> <p>ISignals describe the Interface between the Precompile configured RTE and the potentially Postbuild configured Com Stack (see ECUC Parameter Mapping).</p> <p>In case of the SystemSignalGroup an ISignal shall be created for each SystemSignal contained in the SystemSignalGroup.</p> <p>Tags:atp.recommendedPackage=ISignals</p>			
Base	ARObject, CollectableElement, FibexElement, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , Packageable Element, <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
data Transformation	DataTransformation	0..1	ref	<p>Optional reference to a DataTransformation which represents the transformer chain that is used to transform the data that shall be placed inside this ISignal.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=dataTransformation.dataTransformation, dataTransformation.variationPoint.shortLabel vh.latestBindingTime=codeGenerationTime</p>
dataTypePolicy	DataTypePolicyEnum	1	attr	<p>With the aggregation of SwDataDefProps an ISignal specifies how it is represented on the network. This representation follows a particular policy. Note that this causes some redundancy which is intended and can be used to support flexible development methodology as well as subsequent integrity checks.</p> <p>If the policy "networkRepresentationFromComSpec" is chosen the network representation from the ComSpec that is aggregated by the PortPrototype shall be used. If the "override" policy is chosen the requirements specified in the PortInterface and in the ComSpec are not fulfilled by the networkRepresentationProps. In case the System Description doesn't use a complete Software Component Description (VFB View) the "legacy" policy can be chosen.</p>
initValue	ValueSpecification	0..1	aggr	<p>Optional definition of a ISignal's initialValue in case the System Description doesn't use a complete Software Component Description (VFB View). This supports the inclusion of legacy system signals.</p> <p>This value can be used to configure the Signal's "Init Value".</p> <p>If a full DataMapping exist for the SystemSignal this information may be available from a configured Sender ComSpec and ReceiverComSpec. In this case the initvalues in SenderComSpec and/or ReceiverComSpec override this optional value specification. Further restrictions apply from the RTE specification.</p>
iSignalProps	ISignalProps	0..1	aggr	<p>Additional optional ISignal properties that may be stored in different files.</p> <p>Stereotypes: atpSplittable</p> <p>Tags:atp.Splitkey=iSignalProps</p>
iSignalType	ISignalTypeEnum	0..1	attr	This attribute defines whether this iSignal is an array that results in a UINT8_N / UINT8_DYN ComSignalType in the COM configuration or a primitive type.





Class	I Signal	Mult.	Kind	Note
length	Integer	1	attr	<p>Size of the signal in bits. The size needs to be derived from the mapped VariableDataPrototype according to the mapping of primitive DataTypes to BaseTypes as used in the RTE. Indicates maximum size for dynamic length signals.</p> <p>The ISignal length of zero bits is allowed.</p>
network Representation Props	SwDataDefProps	0..1	aggr	<p>Specification of the actual network representation. The usage of SwDataDefProps for this purpose is restricted to the attributes compuMethod and baseType. The optional baseType attributes "memAlignment" and "byteOrder" shall not be used.</p> <p>The attribute "dataTypePolicy" in the SystemTemplate element defines whether this network representation shall be ignored and the information shall be taken over from the network representation of the ComSpec.</p> <p>If "override" is chosen by the system integrator the network representation can violate against the requirements defined in the PortInterface and in the network representation of the ComSpec.</p> <p>In case that the System Description doesn't use a complete Software Component Description (VFB View) this element is used to configure "ComSignalDataInvalid Value" and the Data Semantics.</p>
systemSignal	SystemSignal	1	ref	Reference to the System Signal that is supposed to be transmitted in the ISignal.
timeout Substitution Value	ValueSpecification	0..1	aggr	Defines and enables the ComTimeoutSubstitution for this ISignal.
transformation ISignalProps	TransformationISignalProps	*	aggr	A transformer chain consists of an ordered list of transformers. The ISignal specific configuration properties for each transformer are defined in the TransformationISignalProps class. The transformer configuration properties that are common for all ISignals are described in the TransformationTechnology class.

Table A.17: ISignal

Class	ISignalIPduGroup			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreCommunication			
Note	The AUTOSAR COM Layer is able to start and to stop sending and receiving configurable groups of I-Pdus during runtime. An ISignalIPduGroup contains either ISignalIPdus or ISignalIPduGroups. Tags: atp.recommendedPackage=ISignalIPduGroup			
Base	ARObject, CollectableElement, FibexElement, Identifiable, MultilanguageReferable, Packageable Element, Referable			
Attribute	Type	Mult.	Kind	Note
communication Direction	CommunicationDirectionType	1	attr	This attribute determines in which direction IPdus that are contained in this IPduGroup will be transmitted (communication direction can be either In or Out).
communication Mode	String	1	attr	This attribute defines the use-case for this ISignalIPdu Group (e.g. diagnostic, debugging etc.). For example, in a diagnostic mode all IPdus - which are not involved in diagnostic - are disabled. The use cases are not limited to a fixed enumeration and can be specified as a string.





Class	ISignalIPduGroup			
contained ISignalIPdu Group	ISignalIPduGroup	*	ref	An I-Pdu group can be included in other I-Pdu groups. Contained I-Pdu groups shall not be referenced by the EcuInstance.
iSignalIPdu	ISignalIPdu	*	ref	Reference to a set of Signal I-Pdus, which are contained in the ISignal I-Pdu Group. atpVariation: The content of a ISignal I-Pdu group can vary (->vehicle modes). Stereotypes: atpVariation Tags: vh.latestBindingTime=postBuild
nmPdu	NmPdu	*	ref	Reference to a set of NmPdus with NmUserData, which are contained in the ISignalIPduGroup. Stereotypes: atpVariation Tags: vh.latestBindingTime=postBuild

Table A.18: ISignalIPduGroup

Class	<i>IdentCaption</i> (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::RPTScenario			
Note	This meta-class represents the caption. This allows having some meta classes optionally identifiable.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Subclasses	<i>BswServiceDependencyIdent</i> , <i>ExternalTriggeringPointIdent</i> , <i>ModeAccessPointIdent</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.19: IdentCaption

Class	<i>Identifiable</i> (abstract)
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::Identifiable
Note	Instances of this class can be referred to by their identifier (within the namespace borders). In addition to this, Identifiables are objects which contribute significantly to the overall structure of an AUTOSAR description. In particular, Identifiables might contain Identifiables.
Base	ARObject, <i>MultilanguageReferrable</i> , <i>Referrable</i>
Subclasses	<i>ARPackage</i> , <i>AbstractDolpLogicAddressProps</i> , <i>AbstractEvent</i> , <i>AbstractImplementationDataTypeElement</i> , <i>AbstractSecurityEventFilter</i> , <i>AbstractSecurityIdsmInstanceFilter</i> , <i>AbstractServiceInstance</i> , Application Endpoint, ApplicationError, ApplicationPartitionToEcuPartitionMapping, AsynchronousServerCallResult Point, <i>AtpBlueprint</i> , <i>AtpBlueprintable</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , AutosarOperationArgumentInstance, AutosarVariableInstance, <i>BinaryManifestAddressableObject</i> , BinaryManifestItemDefinition, <i>Binary ManifestResource</i> , BinaryManifestResourceDefinition, BlockState, BswInternalTriggeringPoint, Bsw ModuleDependency, <i>BuildActionEntity</i> , BuildActionEnvironment, CanTpAddress, CanTpChannel, CanTp Node, Chapter, ClassContentConditional, ClientIdDefinition, ClientServerOperation, Code, <i>Collectable Element</i> , ComManagementMapping, <i>CommConnectorPort</i> , <i>CommunicationConnector</i> , <i>Communication Controller</i> , Compiler, ConsistencyNeeds, ConsumedEventGroup, CouplingPort, <i>CouplingPortStructural Element</i> , <i>CpSoftwareClusterResource</i> , <i>CpSoftwareClusterResourceToApplicationPartitionMapping</i> , Cp SoftwareClusterToEcuInstanceMapping, CpSoftwareClusterToResourceMapping, <i>CryptoService Mapping</i> , DataPrototypeGroup, DataTransformation, DependencyOnArtifact, <i>DiagEventDebounce Algorithm</i> , <i>DiagnosticConnectedIndicator</i> , <i>DiagnosticDataElement</i> , <i>DiagnosticFunctionInhibitSource</i> , <i>DiagnosticRoutineSubfunction</i> , DltArgument, DltLogChannel, DltMessage, DolpInterface, DolpLogic Address, DolpRoutingActivation, ECUMapping, <i>EOCExecutableEntityRefAbstract</i> , EcuPartition, Ecuc ContainerValue, <i>EcucDefinitionElement</i> , EcucDestinationUriDef, EcucEnumerationLiteralDef, Ecuc Query, EcucValidationCondition, EndToEndProtection, EthernetWakeUpSleepOnDatalineConfig,





Class	Identifiable (abstract)				
△					
	ExclusiveArea, ExecutableEntity, ExecutionTime, FMAutoDef, FMFeatureMapAssertion, FMFeatureMapCondition, FMFeatureMapElement, FMFeatureRelation, FMFeatureRestriction, FMFeatureSelection, FlatInstanceDescriptor, FlexrayArTpNode, FlexrayTpConnectionControl, FlexrayTpNode, FlexrayTpPduPool, FrameTriggering, GeneralParameter, GlobalTimeGateway, GlobalTimeMaster, GlobalTimeSlave, HeapUsage, HwAttributeDef, HwAttributeLiteralDef, HwPin, HwPinGroup, IPSecRule, IPv6ExtHeaderFilterList, ISignalToIPduMapping, ISignalTriggering, IdentCaption, InternalTriggeringPoint, J1939SharedAddressCluster, J1939TpNode, Keyword, LifeCycleState, LinScheduleTable, LinTpNode, Linker, MacMulticastGroup, McDataInstance, MemorySection, ModeDeclaration, ModeDeclarationMapping, ModeSwitchPoint, NetworkEndpoint, NmCluster, NmEcu, NmNode, NvBlockDescriptor, PackageableElement, ParameterAccess, PduToFrameMapping, PduTriggering, PerInstanceMemory, PhysicalChannel, PortElementToCommunicationResourceMapping, PortGroup, PortInterfaceMapping, PossibleErrorReaction, ResourceConsumption, RootSwCompositionPrototype, RptComponent, RptContainer, RptExecutableEntity, RptExecutableEntityEvent, RptExecutionContext, RptProfile, RptServicePoint, RunnableEntityGroup, SdgAttribute, SdgClass, SecureCommunicationAuthenticationProps, SecureCommunicationFreshnessProps, SecurityEventContextProps, ServerCallPoint, ServiceNeeds, SignalServiceTranslationElementProps, SignalServiceTranslationEventProps, SignalServiceTranslationProps, SocketAddress, SomeipTpChannel, SpecElementReference, StackUsage, StaticSocketConnection, StructuredReq, SwGenericAxisParamType, SwServiceArg, SwcServiceDependency, SwcToApplicationPartitionMapping, SwcToEcuMapping, SwcToImplMapping, SystemMapping, TDCpSoftwareClusterMapping, TDCpSoftwareClusterResourceMapping, TcpOptionFilterList, TimingCondition, TimingConstraint, TimingDescription, TimingExtensionResource, TimingModelInstance, TlsCryptoCipherSuite, Topic1, TpAddress, TraceableTable, TraceableText, TracedFailure, TransformationProps, TransformationTechnology, Trigger, VariableAccess, VariationPointProxy, ViewMap, VlanConfig, WaitPoint				
Attribute	Type	Mult.	Kind	Note	
adminData	AdminData	0..1	aggr	This represents the administrative data for the identifiable object. Tags: xml.sequenceOffset=-40	
annotation	Annotation	*	aggr	Possibility to provide additional notes while defining a model element (e.g. the ECU Configuration Parameter Values). These are not intended as documentation but are mere design notes. Tags: xml.sequenceOffset=-25	
category	CategoryString	0..1	attr	The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints. Tags: xml.sequenceOffset=-50	
desc	MultiLanguageOverviewParagraph	0..1	aggr	This represents a general but brief (one paragraph) description what the object in question is about. It is only one paragraph! Desc is intended to be collected into overview tables. This property helps a human reader to identify the object in question. More elaborate documentation, (in particular how the object is built or used) should go to "introduction". Tags: xml.sequenceOffset=-60	
introduction	DocumentationBlock	0..1	aggr	This represents more information about how the object in question is built or is used. Therefore it is a DocumentationBlock. Tags: xml.sequenceOffset=-30	
uuid	String	0..1	attr	The purpose of this attribute is to provide a globally unique identifier for an instance of a meta-class. The values of this attribute should be globally unique strings prefixed by the type of identifier. For example, to include a DCE UUID as defined by The Open Group, the UUID would be preceded by "DCE:". The values of this attribute	▽





Class	<i>Identifiable</i> (abstract)			
	<p style="text-align: right;">△</p> <p>may be used to support merging of different AUTOSAR models. The form of the UUID (Universally Unique Identifier) is taken from a standard defined by the Open Group (was Open Software Foundation). This standard is widely used, including by Microsoft for COM (GUIDs) and by many companies for DCE, which is based on CORBA. The method for generating these 128-bit IDs is published in the standard and the effectiveness and uniqueness of the IDs is not in practice disputed. If the id namespace is omitted, DCE is assumed. An example is "DCE:2fac1234-31f8-11b4-a222-08002b34c003". The uuid attribute has no semantic meaning for an AUTOSAR model and there is no requirement for AUTOSAR tools to manage the timestamp.</p> <p>Tags:xml.attribute=true</p>			

Table A.20: Identifiable

Class	<i>InternalBehavior</i> (abstract)			
Package	M2::AUTOSARTemplates::CommonStructure::InternalBehavior			
Note	Common base class (abstract) for the internal behavior of both software components and basic software modules/clusters.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Referrable</i>			
Subclasses	BswInternalBehavior, SwcInternalBehavior			
Attribute	Type	Mult.	Kind	Note
constant Memory	ParameterData Prototype	*	aggr	<p>Describes a read only memory object containing characteristic value(s) implemented by this Internal Behavior.</p> <p>The shortName of ParameterDataPrototype has to be equal to the "C" identifier of the described constant.</p> <p>The characteristic value(s) might be shared between Sw ComponentPrototypes of the same SwComponentType.</p> <p>The aggregation of constantMemory is subject to variability with the purpose to support variability in the software component or module implementations.</p> <p>Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=constantMemory.shortName, constant Memory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
constantValue Mapping	ConstantSpecification MappingSet	*	ref	<p>Reference to the ConstanSpecificationMapping to be applied for the particular InternalBehavior</p> <p>Stereotypes: atpSplittable</p> <p>Tags:atp.Splitkey=constantValueMapping</p>
dataType Mapping	DataTypeMappingSet	*	ref	<p>Reference to the DataTypeMapping to be applied for the particular InternalBehavior</p> <p>Stereotypes: atpSplittable</p> <p>Tags:atp.Splitkey= dataTypeMapping</p>





Class	InternalBehavior (abstract)			
exclusiveArea	ExclusiveArea	*	aggr	<p>This specifies an ExclusiveArea for this InternalBehavior. The exclusiveArea is local to the component resp. module. The aggregation of ExclusiveAreas is subject to variability. Note: the number of ExclusiveAreas might vary due to the conditional existence of RunnableEntities or BswModuleEntities.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=exclusiveArea.shortName, exclusive Area.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
exclusiveArea NestingOrder	ExclusiveAreaNesting Order	*	aggr	<p>This represents the set of ExclusiveAreaNestingOrder owned by the InternalBehavior.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=exclusiveAreaNestingOrder.shortName, exclusiveAreaNestingOrder.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>
staticMemory	VariableDataPrototype	*	aggr	<p>Describes a read and writeable static memory object representing measurement variables implemented by this software component. The term "static" is used in the meaning of "non-temporary" and does not necessarily specify a linker encapsulation. This kind of memory is only supported if supportsMultipleInstantiation is FALSE.</p> <p>The shortName of the VariableDataPrototype has to be equal with the "C" identifier of the described variable.</p> <p>The aggregation of staticMemory is subject to variability with the purpose to support variability in the software component's implementations.</p> <p>Typically different algorithms in the implementation are requiring different number of memory objects.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=staticMemory.shortName, static Memory.variationPoint.shortLabel vh.latestBindingTime=preCompileTime</p>

Table A.21: InternalBehavior

Class	<>atpVariation>> J1939Cluster			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::Fibex4Can::CanTopology			
Note	J1939 specific cluster attributes. Tags: atp.recommendedPackage=CommunicationClusters			
Base	ARObject, AbstractCanCluster, CollectableElement, CommunicationCluster, FibexElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable			
Attribute	Type	Mult.	Kind	Note
networkId	PositiveInteger	0..1	attr	This represents the network ID for the J1939 cluster.
re-quest2Support	Boolean	0..1	attr	Enables support for the Request2 PGN (RQST2).





Class	<>atpVariation>> J1939Cluster			
usesAddressArbitration	Boolean	0..1	attr	<p>Defines whether the nodes attached to this channel use an initial address claim, and whether they react to contending address claims of other nodes.</p> <p>True: The initial address claim is sent, and the node reacts to address claims of other nodes.</p> <p>False: The node only sends an address claim upon request, and does not care for contending address claims.</p>

Table A.22: J1939Cluster

Class	J1939DcmIPdu			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreCommunication			
Note	Represents the IPdus handled by J1939Dcm. Tags: atp.recommendedPackage=Pdus			
Base	ARObject, CollectableElement, FibexElement, IPdu, Identifiable, MultilanguageReferrable, PackageableElement, Pdu, Referrable			
Attribute	Type	Mult.	Kind	Note
diagnosticMessageType	PositiveInteger	0..1	attr	This attribute is used to identify the actual DMx message, e.g 1 means DM01, etc.

Table A.23: J1939DcmIPdu

Class	J1939NmNode			
Package	M2::AUTOSARTemplates::SystemTemplate::NetworkManagement			
Note	J1939 specific NM Node attributes.			
Base	ARObject, Identifiable, MultilanguageReferrable, NmNode, Referrable			
Attribute	Type	Mult.	Kind	Note
nodeName	J1939NodeName	0..1	aggr	NodeName configuration

Table A.24: J1939NmNode

Class	ModeDeclaration			
Package	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
Note	Declaration of one Mode. The name and semantics of a specific mode is not defined in the meta-model.			
Base	ARObject, AtpClassifier, AtpFeature, AtpStructureElement, Identifiable, MultilanguageReferrable, Referrable			
Attribute	Type	Mult.	Kind	Note
value	PositiveInteger	0..1	attr	The RTE shall take the value of this attribute for generating the source code representation of this Mode Declaration.

Table A.25: ModeDeclaration

Class	ModeDeclarationGroup			
Package	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
Note	A collection of Mode Declarations. Also, the initial mode is explicitly identified. Tags: atp.recommendedPackage=ModeDeclarationGroups			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
initialMode	ModeDeclaration	0..1	ref	The initial mode of the ModeDeclarationGroup. This mode is active before any mode switches occurred.
mode Declaration	ModeDeclaration	*	aggr	The ModeDeclarations collected in this ModeDeclaration Group. Stereotypes: atpVariation Tags: vh.latestBindingTime=blueprintDerivationTime
modeManager ErrorBehavior	ModeErrorBehavior	0..1	aggr	This represents the ability to define the error behavior expected by the mode manager in case of errors on the mode user side (e.g. terminated mode user).
modeTransition	ModeTransition	*	aggr	This represents the available ModeTransitions of the ModeDeclarationGroup
modeUserError Behavior	ModeErrorBehavior	0..1	aggr	This represents the definition of the error behavior expected by the mode user in case of errors on the mode manager side (e.g. terminated mode manager).
onTransition Value	PositiveInteger	0..1	attr	The value of this attribute shall be taken into account by the RTE generator for programmatically representing a value used for the transition between two statuses.

Table A.26: ModeDeclarationGroup

Class	ModeDeclarationGroupPrototype			
Package	M2::AUTOSARTemplates::CommonStructure::ModeDeclaration			
Note	The ModeDeclarationGroupPrototype specifies a set of Modes (ModeDeclarationGroup) which is provided or required in the given context.			
Base	<i>ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
swCalibration Access	SwCalibrationAccess Enum	0..1	attr	This allows for specifying whether or not the enclosing ModeDeclarationGroupPrototype can be measured at run-time.
type	ModeDeclarationGroup	0..1	tref	The "collection of ModeDeclarations" (= ModeDeclaration Group) supported by a component Stereotypes: isOfType

Table A.27: ModeDeclarationGroupPrototype

Class	ModelInBswModuleDescriptionInstanceRef			
Package	M2::AUTOSARTemplates::BswModuleTemplate::BswOverview::InstanceRefs			
Note				
Base	<i>ARObject, AtpInstanceRef</i>			
Attribute	Type	Mult.	Kind	Note
base	BswModuleDescription	0..1	ref	Stereotypes: atpDerived Tags: xml.sequenceOffset=10





Class	ModelInBswModuleDescriptionInstanceRef			
contextMode Declaration Group	ModeDeclarationGroup Prototype	0..1	ref	Tags: xml.sequenceOffset=20
targetMode	ModeDeclaration	0..1	ref	Tags: xml.sequenceOffset=30

Table A.28: ModelInBswModuleDescriptionInstanceRef

Primitive	NameToken
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::PrimitiveTypes
Note	This is an identifier as used in xml, e.g. xml-names. Basic difference to Identifier is the fact that it can contain "-". Tags: xml.xsd.customType=NMTOKEN-STRING xml.xsd.type=NMTOKEN

Table A.29: NameToken

Class	NvDataInterface			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	A non volatile data interface declares a number of VariableDataPrototypes to be exchanged between non volatile block components and atomic software components.			
Base	ARElement , ARObject , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpType , CollectableElement , DataInterface , Identifiable , MultilanguageReferrable , PackageableElement , PortInterface , Referrable			
Attribute	Type	Mult.	Kind	Note
nvData	VariableDataPrototype	*	aggr	The VariableDataPrototype of this nv data interface.

Table A.30: NvDataInterface

Class	PPortPrototype			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	Component port providing a certain port interface.			
Base	ARObject , AbstractProvidedPortPrototype , AtpBlueprintable , AtpFeature , AtpPrototype , Identifiable , MultilanguageReferrable , PortPrototype , Referrable			
Attribute	Type	Mult.	Kind	Note
provided Interface	PortInterface	0..1	tref	The interface that this port provides. Stereotypes: isOfType

Table A.31: PPortPrototype

Class	PortInterface (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	Abstract base class for an interface that is either provided or required by a port of a software component.			
Base	ARElement , ARObject , AtpBlueprint , AtpBlueprintable , AtpClassifier , AtpType , CollectableElement , Identifiable , MultilanguageReferrable , PackageableElement , Referrable			





Class	PortInterface (abstract)			
Subclasses	ClientServerInterface , DataInterface , ModeSwitchInterface, TriggerInterface			
Attribute	Type	Mult.	Kind	Note
isService	Boolean	0..1	attr	<p>This flag is set if the PortInterface is to be used for communication between an</p> <ul style="list-style-type: none"> • ApplicationSwComponentType or • ServiceProxySwComponentType or • SensorActuatorSwComponentType or • ComplexDeviceDriverSwComponentType • ServiceSwComponentType • EcuAbstractionSwComponentType <p>and a ServiceSwComponentType (namely an AUTOSAR Service) located on the same ECU. Otherwise the flag is not set.</p>
serviceKind	ServiceProviderEnum	0..1	attr	This attribute provides further details about the nature of the applied service.

Table A.32: PortInterface

Class	PortPrototype (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	Base class for the ports of an AUTOSAR software component. The aggregation of PortPrototypes is subject to variability with the purpose to support the conditional existence of ports.			
Base	ARObject, AtpBlueprintable, AtpFeature, AtpPrototype, Identifiable , MultilanguageReferrable , Referrable			
Subclasses	AbstractProvidedPortPrototype , AbstractRequiredPortPrototype			
Attribute	Type	Mult.	Kind	Note
clientServerAnnotation	ClientServerAnnotation	*	aggr	Annotation of this PortPrototype with respect to client/server communication.
delegatedPortAnnotation	DelegatedPortAnnotation	0..1	aggr	Annotations on this delegated port.
ioHwAbstractionServerAnnotation	IoHwAbstractionServerAnnotation	*	aggr	Annotations on this IO Hardware Abstraction port.
modePortAnnotation	ModePortAnnotation	*	aggr	Annotations on this mode port.
nvDataPortAnnotation	NvDataPortAnnotation	*	aggr	Annotations on this non volatile data port.
parameterPortAnnotation	ParameterPortAnnotation	*	aggr	Annotations on this parameter port.
senderReceiverAnnotation	SenderReceiverAnnotation	*	aggr	Collection of annotations of this ports sender/receiver communication.
triggerPortAnnotation	TriggerPortAnnotation	*	aggr	Annotations on this trigger port.

Table A.33: PortPrototype

Class	Referrable (abstract)			
Package	M2::AUTOSARTemplates::GenericStructure::GeneralTemplateClasses::Identifiable			
Note	Instances of this class can be referred to by their identifier (while adhering to namespace borders).			
Base	ARObject			
Subclasses	AtpDefinition, BswDistinguishedPartition, BswModuleCallPoint, BswModuleClientServerEntry, BswVariableAccess, CouplingPortTrafficClassAssignment, <i>DiagnosticDebounceAlgorithmProps</i> , <i>DiagnosticEnvModeElement</i> , EthernetPriorityRegeneration, EventHandler, ExclusiveAreaNestingOrder, HwDescriptionEntity, ImplementationProps, LinSlaveConfigIdent, ModeTransition, <i>MultilanguageReferrable</i> , PduActivationRoutingGroup, PncMappingIdent, SingleLanguageReferrable, SoConIPdulIdentifier, SocketConnectionBundle, TimeSyncServerConfiguration, TpConnectionIdent			
Attribute	Type	Mult.	Kind	Note
shortName	Identifier	1	attr	<p>This specifies an identifying shortName for the object. It needs to be unique within its context and is intended for humans but even more for technical reference.</p> <p>Stereotypes: atplIdentityContributor</p> <p>Tags:</p> <ul style="list-style-type: none"> xml.enforceMinMultiplicity=true xml.sequenceOffset=-100
shortNameFragment	ShortNameFragment	*	aggr	<p>This specifies how the Referrable.shortName is composed of several shortNameFragments.</p> <p>Tags: xml.sequenceOffset=-90</p>

Table A.34: Referrable

Class	Sdg			
Package	M2::MSR::AsamHdo::SpecialData			
Note	<p>Sdg (SpecialDataGroup) is a generic model which can be used to keep arbitrary information which is not explicitly modeled in the meta-model.</p> <p>Sdg can have various contents as defined by sdgContentsType. Special Data should only be used moderately since all elements should be defined in the meta-model.</p> <p>Thereby SDG should be considered as a temporary solution when no explicit model is available. If an sdg Caption is available, it is possible to establish a reference to the sdg structure.</p>			
Base	ARObject			
Attribute	Type	Mult.	Kind	Note
gid	NameToken	1	attr	<p>This attribute specifies an identifier. Gid comes from the SGML/XML-Term "Generic Identifier" which is the element name in XML. The role of this attribute is the same as the name of an XML - element.</p> <p>Tags: xml.attribute=true</p>
sdgCaption	SdgCaption	0..1	aggr	<p>This aggregation allows to assign the properties of Identifiable to the sdg. By this, a shortName etc. can be assigned to the Sdg.</p> <p>Tags: xml.sequenceOffset=20</p>
sdgContentsType	SdgContents	0..1	aggr	<p>This is the content of the Sdg.</p> <p>Tags:</p> <ul style="list-style-type: none"> xml.roleElement=false xml.roleWrapperElement=false xml.sequenceOffset=30 xml.typeElement=false xml.typeWrapperElement=false

Table A.35: Sdg

Class	SenderReceiverInterface			
Package	M2::AUTOSARTemplates::SWComponentTemplate::PortInterface			
Note	A sender/receiver interface declares a number of data elements to be sent and received. Tags: atp.recommendedPackage=PortInterfaces			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, DataInterface, Identifiable, MultilanguageReferrable, PackageableElement, PortInterface, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
dataElement	VariableDataPrototype	*	aggr	The data elements of this SenderReceiverInterface.
invalidation Policy	InvalidationPolicy	*	aggr	InvalidationPolicy for a particular dataElement
metaDataItem Set	MetaDataAdapterSet	*	aggr	This aggregation defines fixed sets of meta-data items associated with dataElements of the enclosing Sender ReceiverInterface

Table A.36: SenderReceiverInterface

Class	ServiceNeeds (abstract)			
Package	M2::AUTOSARTemplates::CommonStructure::ServiceNeeds			
Note	This expresses the abstract needs that a Software Component or Basic Software Module has on the configuration of an AUTOSAR Service to which it will be connected. "Abstract needs" means that the model abstracts from the Configuration Parameters of the underlying Basic Software.			
Base	<i>ARObject, Identifiable, MultilanguageReferrable, Referrable</i>			
Subclasses	BswMgrNeeds, ComMgrUserNeeds, CryptoKeyManagementNeeds, CryptoServiceJobNeeds, Crypto ServiceNeeds, <i>DiagnosticCapabilityElement</i> , DltUserNeeds, <i>DolpServiceNeeds</i> , EcuStateMgrUser Needs, ErrorTracerNeeds, FunctionInhibitionAvailabilityNeeds, <i>FunctionInhibitionNeeds</i> , Global SupervisionNeeds, HardwareTestNeeds, IdsMgrCustomTimestampNeeds, IdsMgrNeeds, IndicatorStatus Needs, J1939DcmDm19Support, J1939RmlIncomingRequestServiceNeeds, J1939RmOutgoingRequest ServiceNeeds, NvBlockNeeds, SecureOnBoardCommunicationNeeds, SupervisedEntityCheckpoint Needs, SupervisedEntityNeeds, SyncTimeBaseMgrUserNeeds, V2xFacUserNeeds, V2xMUserNeeds, VendorSpecificServiceNeeds			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.37: ServiceNeeds

Class	SwBaseType			
Package	M2::MSR::AsamHdo::BaseTypes			
Note	This meta-class represents a base type used within ECU software. Tags: atp.recommendedPackage=BaseTypes			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, BaseType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
-	-	-	-	-

Table A.38: SwBaseType

Class	SwComponentPrototype			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Composition			
Note	Role of a software component within a composition.			
Base	<i>ARObject, AtpFeature, AtpPrototype, Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
type	SwComponentType	0..1	tref	Type of the instance. Stereotypes: isOfType

Table A.39: SwComponentPrototype

Class	SwComponentType (abstract)			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Components			
Note	Base class for AUTOSAR software components.			
Base	<i>ARElement, ARObject, AtpBlueprint, AtpBlueprintable, AtpClassifier, AtpType, CollectableElement, Identifiable, MultilanguageReferrable, PackageableElement, Referrable</i>			
Subclasses	AtomicSwComponentType , CompositionSwComponentType , ParameterSwComponentType			
Attribute	Type	Mult.	Kind	Note
consistency Needs	ConsistencyNeeds	*	aggr	This represents the collection of ConsistencyNeeds owned by the enclosing SwComponentType. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=consistencyNeeds.shortName, consistency Needs.variationPoint.shortLabel vh.latestBindingTime=preCompileTime
port	PortPrototype	*	aggr	The PortPrototypes through which this SwComponent Type can communicate. The aggregation of PortPrototype is subject to variability with the purpose to support the conditional existence of PortPrototypes. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=port.shortName, port.variationPoint.short Label vh.latestBindingTime=preCompileTime
portGroup	PortGroup	*	aggr	A port group being part of this component. Stereotypes: atpVariation Tags: vh.latestBindingTime=preCompileTime
swComponent Documentation	SwComponent Documentation	0..1	aggr	This adds a documentation to the SwComponentType. Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=swComponentDocumentation, sw ComponentDocumentation.variationPoint.shortLabel vh.latestBindingTime=preCompileTime xml.sequenceOffset=-10
unitGroup	UnitGroup	*	ref	This allows for the specification of which UnitGroups are relevant in the context of referencing SwComponentType.

Table A.40: SwComponentType

Class	System			
Package	M2::AUTOSARTemplates::SystemTemplate			
Note	<p>The top level element of the System Description. The System description defines five major elements: Topology, Software, Communication, Mapping and Mapping Constraints.</p> <p>The System element directly aggregates the elements describing the Software, Mapping and Mapping Constraints; it contains a reference to an ASAM FIBEX description specifying Communication and Topology.</p> <p>Tags:atp.recommendedPackage=Systems</p>			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>AtpClassifier</i> , <i>AtpFeature</i> , <i>AtpStructureElement</i> , <i>CollectableElement</i> , <i>Identifiable</i> , <i>MultilanguageReferable</i> , <i>PackageableElement</i> , <i>Referable</i>			
Attribute	Type	Mult.	Kind	Note
clientIdDefinitionSet	ClientIdDefinitionSet	*	ref	<p>Set of Client Identifiers that are used for inter-ECU client-server communication in the System.</p>
containerIPduHeaderByteOrder	ByteOrderEnum	0..1	attr	Defines the byteOrder of the header in ContainerIPdus.
ecuExtractVersion	RevisionLabelString	0..1	attr	Version number of the Ecu Extract.
fibexElement	FibexElement	*	ref	<p>Reference to ASAM FIBEX elements specifying Communication and Topology.</p> <p>All Fibex Elements used within a System Description shall be referenced from the System Element.</p> <p>atpVariation: In order to describe a product-line, all Fibex Elements can be optional.</p> <p>Stereotypes: atpVariation Tags:vh.latestBindingTime=postBuild</p>
interpolationRoutineMappingSet	InterpolationRoutineMappingSet	*	ref	This reference identifies the InterpolationRoutineMapping Sets that are relevant in the context of the enclosing System.
j1939SharedAddressCluster	J1939SharedAddressCluster	*	aggr	<p>Collection of J1939Clusters that share a common address space for the routing of messages.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=j1939SharedAddressCluster.shortName, j1939SharedAddressCluster.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
mapping	SystemMapping	*	aggr	<p>Aggregation of all mapping aspects (mapping of SW components to ECUs, mapping of data elements to signals, and mapping constraints).</p> <p>In order to support OEM / Tier 1 interaction and shared development for one common System this aggregation is atpSplittable and atpVariation. The content of System Mapping can be provided by several parties using different names for the SystemMapping.</p> <p>This element is not required when the System description is used for a network-only use-case.</p> <p>Stereotypes: atpSplittable; atpVariation Tags: atp.Splitkey=mapping.shortName, mapping.variationPoint.shortLabel vh.latestBindingTime=postBuild</p>
pncVectorLength	PositiveInteger	0..1	attr	Length of the partial networking request release information vector (in bytes).





Class	System			
pncVectorOffset	PositiveInteger	0..1	attr	Absolute offset (with respect to the NM-PDU) of the partial networking request release information vector that is defined in bytes as an index starting with 0.
rootSoftwareComposition	RootSwCompositionPrototype	0..1	aggr	<p>Aggregation of the root software composition, containing all software components in the System in a hierarchical structure. This element is not required when the System description is used for a network-only use-case.</p> <p>atpVariation: The RootSwCompositionPrototype can vary.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=rootSoftwareComposition.shortName, rootSoftwareComposition.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime</p>
swCluster	CpSoftwareCluster	*	ref	<p>CP Software Clusters of this System</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=swCluster.cpSoftwareCluster, swCluster.variationPoint.shortLabel atp.Status=draft vh.latestBindingTime=systemDesignTime</p>
systemDocumentation	Chapter	*	aggr	<p>Possibility to provide additional documentation while defining the System. The System documentation can be composed of several chapters.</p> <p>Stereotypes: atpSplittable; atpVariation</p> <p>Tags: atp.Splitkey=systemDocumentation.shortName, systemDocumentation.variationPoint.shortLabel vh.latestBindingTime=systemDesignTime xml.sequenceOffset=-10</p>
systemVersion	RevisionLabelString	1	attr	Version number of the System Description.

Table A.41: System

Class	SystemSignal			
Package	M2::AUTOSARTemplates::SystemTemplate::Fibex::FibexCore::CoreCommunication			
Note	The system signal represents the communication system's view of data exchanged between SW components which reside on different ECUs. The system signals allow to represent this communication in a flattened structure, with exactly one system signal defined for each data element prototype sent and received by connected SW component instances.			
	Tags: atp.recommendedPackage=SystemSignals			
Base	ARElement , ARObject , CollectableElement , Identifiable , MultilanguageReferrable , PackageableElement , Referable			
Attribute	Type	Mult.	Kind	Note
dynamicLength	Boolean	1	attr	The length of dynamic length signals is variable in run-time. Only a maximum length of such a signal is specified in the configuration (attribute length in ISignal element).
physicalProps	SwDataDefProps	0..1	aggr	Specification of the physical representation.

Table A.42: SystemSignal

Class	Unit			
Package	M2::MSR::AsamHdo::Units			
Note	<p>This is a physical measurement unit. All units that might be defined should stem from SI units. In order to convert one unit into another factor and offset are defined.</p> <p>For the calculation from SI-unit to the defined unit the factor (factorSiToUnit) and the offset (offsetSiToUnit) are applied as follows:</p> $x \{[unit]\} := y * \{[siUnit]\} * \text{factorSiToUnit} \{[unit]/\{siUnit\}\} + \text{offsetSiToUnit} \{[unit]\}$ <p>For the calculation from a unit to SI-unit the reciprocal of the factor (factorSiToUnit) and the negation of the offset (offsetSiToUnit) are applied.</p> $y \{[siUnit]\} := (x * \{[unit]\} - \text{offsetSiToUnit} \{[unit]\}) / (\text{factorSiToUnit} \{[unit]/\{siUnit\}\})$ <p>Tags:atp.recommendedPackage=Units</p>			
Base	<i>ARElement</i> , <i>ARObject</i> , <i>CollectableElement</i> , <i>Identifiable</i> , <i>MultilanguageReferrable</i> , <i>Packageable Element</i> , <i>Referrable</i>			
Attribute	Type	Mult.	Kind	Note
displayName	SingleLanguageUnit Names	0..1	aggr	<p>This specifies how the unit shall be displayed in documents or in user interfaces of tools. The displayName corresponds to the Unit.Display in an ASAM MCD-2MC file.</p> <p>Tags:xml.sequenceOffset=20</p>
factorSiToUnit	Float	0..1	attr	<p>This is the factor for the conversion from SI Units to units. The inverse is used for conversion from units to SI Units.</p> <p>Tags:xml.sequenceOffset=30</p>
offsetSiToUnit	Float	0..1	attr	<p>This is the offset for the conversion from and to siUnits.</p> <p>Tags:xml.sequenceOffset=40</p>
physical Dimension	PhysicalDimension	0..1	ref	<p>This association represents the physical dimension to which the unit belongs to. Note that only values with units of the same physical dimensions might be converted.</p> <p>Tags:xml.sequenceOffset=50</p>

Table A.43: Unit

Class	ValueSpecification (abstract)			
Package	M2::AUTOSARTemplates::CommonStructure::Constants			
Note	Base class for expressions leading to a value which can be used to initialize a data object.			
Base	<i>ARObject</i>			
Subclasses	<i>AbstractRuleBasedValueSpecification</i> , <i>ApplicationValueSpecification</i> , <i>CompositeValueSpecification</i> , <i>ConstantReference</i> , <i>NotAvailableValueSpecification</i> , <i>NumericalValueSpecification</i> , <i>ReferenceValue Specification</i> , <i>TextValueSpecification</i>			
Attribute	Type	Mult.	Kind	Note
shortLabel	Identifier	0..1	attr	This can be used to identify particular value specifications for human readers, for example elements of a record type.

Table A.44: ValueSpecification

Class	VariableDataPrototype			
Package	M2::AUTOSARTemplates::SWComponentTemplate::Datatype::DataPrototypes			
Note	<p>A VariableDataPrototype is used to contain values in an ECU application. This means that most likely a VariableDataPrototype allocates "static" memory on the ECU. In some cases optimization strategies might lead to a situation where the memory allocation can be avoided.</p> <p>In particular, the value of a VariableDataPrototype is likely to change as the ECU on which it is used executes.</p>			
Base	<i>ARObject, AtpFeature, AtpPrototype, AutosarDataPrototype, DataPrototype, Identifiable, MultilanguageReferrable, Referrable</i>			
Attribute	Type	Mult.	Kind	Note
initValue	ValueSpecification	0..1	agr	Specifies initial value(s) of the VariableDataPrototype

Table A.45: VariableDataPrototype

B History of Constraints and Specification Items

B.1 Constraint History of this Document according to AUTOSAR R4.2.1

B.1.1 Added Specification Items in R4.2.1

Number	Heading
[TPS_DEXT_01000]	AUTOSAR diagnostics supports two kinds of data identifiers
[TPS_DEXT_01001]	Definition of a fixed-sized array
[TPS_DEXT_01002]	Definition of a variable-sized array
[TPS_DEXT_01003]	<i>DiagnosticContributionSet</i> is the central part of the <i>DiagnosticExtract</i>
[TPS_DEXT_01004]	<i>DiagnosticContributionSet</i> defines the scope of the <i>DiagnosticExtract</i>
[TPS_DEXT_01005]	<i>DiagnosticContributionSet</i> can exist independently
[TPS_DEXT_01006]	The role of <i>DiagnosticServiceTable</i> s in the context of a <i>DiagnosticContributionSet</i>
[TPS_DEXT_01007]	Common properties of a <i>DiagnosticExtract</i>
[TPS_DEXT_01008]	<i>DiagnosticContributionSet</i> defines the scope for the application of the common diagnostic properties
[TPS_DEXT_01009]	Limited support for the configuration of custom diagnostic services
[TPS_DEXT_01010]	Configuration of custom diagnostic services
[TPS_DEXT_01011]	Semantics of <i>DiagnosticSession.id</i>
[TPS_DEXT_01012]	Rationale for the modeling of the multiplicity of <i>DiagnosticAccessPermission.securityLevel</i>
[TPS_DEXT_01013]	Specification of sub-functions by means of attribute <i>DiagnosticServiceInstance.category</i>





Number	Heading
[TPS_DEXT_01014]	Possible values of the <code>category</code> attribute for diagnostic services
[TPS_DEXT_01015]	Meaning of attributes of <code>DiagnosticIOControl</code>
[TPS_DEXT_01016]	The capability <code>returnControlToEcu</code>
[TPS_DEXT_01017]	Meaning of <code>DiagnosticIOControl.dataIdentifier</code>
[TPS_DEXT_01018]	<code>InputOutput Control</code> does not define any sub-functions
[TPS_DEXT_01019]	Correspondence of <code>category</code> values to numerical values mentioned in the ISO 14229-1
[TPS_DEXT_01020]	Manufacturer-specific values for sub-functions of service <code>EcuReset</code>
[TPS_DEXT_01021]	Semantics of <code>DiagnosticEcuReset.customSubFunctionNumber</code>
[TPS_DEXT_01022]	<code>ClearDiagnosticInformation</code> does not define any sub-functions
[TPS_DEXT_01023]	<code>WriteMemoryByAddress</code> does not define any sub-functions
[TPS_DEXT_01024]	<code>ReadMemoryByAddress</code> does not define any sub-functions
[TPS_DEXT_01025]	<code>TransferExit</code> does not define any sub-functions
[TPS_DEXT_01026]	<code>DataTransfer</code> does not define any sub-functions
[TPS_DEXT_01027]	<code>RequestDownload</code> does not define any sub-functions
[TPS_DEXT_01028]	<code>RequestUpload</code> does not define any sub-functions
[TPS_DEXT_01029]	Correspondence of <code>category</code> values to numerical values mentioned in the ISO 14229-1
[TPS_DEXT_01030]	Manufacturer-specific values for sub-functions of service <code>Communication-Control</code>
[TPS_DEXT_01031]	Semantics of <code>DiagnosticComControl.customSubFunctionNumber</code>
[TPS_DEXT_01032]	Impact of the <code>DiagnosticComControlClass</code> on the state management for <code>CommunicationClusters</code>
[TPS_DEXT_01033]	Semantics of triggers in the context of a <code>DiagnosticResponseOnEvent</code>
[TPS_DEXT_01034]	Sub-functions of the service <code>ReadDTCInformation</code>
[TPS_DEXT_01035]	Existence of <code>DiagnosticRoutine.stop</code> and <code>DiagnosticRoutine.requestResult</code>
[TPS_DEXT_01036]	Work-flow within the execution of the diagnostic service <code>SecurityAccess</code>
[TPS_DEXT_01037]	Semantics of <code>DiagnosticSecurityAccess.requestSeedId</code>
[TPS_DEXT_01038]	Motivation for making the reference <code>DiagnosticSecurityAccess.securityLevel</code> <>atpSplittable<>
[TPS_DEXT_01039]	Identification of the sub-function of <code>DiagnosticSessionControl</code>
[TPS_DEXT_01040]	Use case where the <code>DiagnosticExtract</code> refers to software-components
[TPS_DEXT_01041]	Semantics of attribute <code>DiagnosticServiceDataMapping.diagnosticDataElement</code>
[TPS_DEXT_01042]	Dem uses <code>DiagnosticServiceDataMapping</code>
[TPS_DEXT_01043]	Purpose of <code>DiagnosticServiceSwMapping</code>
[TPS_DEXT_01044]	<code>BswServiceDependency</code> needs to act as the target of a reference
[TPS_DEXT_01045]	Supported diagnostic services





Number	Heading
[TPS_DEXT_01046]	ECU configuration is not suitable to be exchanged between partners in an ECU development project
[TPS_DEXT_01047]	Differences in the development processes for diagnostics at automotive OEMs and ECU suppliers
[TPS_DEXT_01048]	Actual algorithm for the diagnostic event debouncing
[TPS_DEXT_01049]	Consistency of <code>DiagnosticServiceSwMapping</code> with respect to routine IDs
[TPS_DEXT_01050]	Consistency of <code>DiagnosticServiceSwMapping</code> with respect to data IDs
[TPS_DEXT_01051]	Consistency of <code>DiagnosticServiceSwMapping</code> with respect to data IDs
[TPS_DEXT_01052]	Existence of attribute <code>DiagnosticServiceInstance.accessPermission</code>
[TPS_DEXT_01053]	Existence of <code>DiagnosticSecurityAccess.securityLevel</code>
[TPS_DEXT_01054]	Existence of <code>DiagnosticDataByIdentifier.dataIdentifier</code>
[TPS_DEXT_01055]	Standardized values of <code>DiagnosticContributionSet.category</code>
[TPS_DEXT_01056]	Applicable values for <code>DiagnosticEcuReset.category</code>
[TPS_DEXT_01057]	Allowed values of <code>DiagnosticComControl.category</code>
[TPS_DEXT_01058]	Standardized values for <code>DiagnosticDynamicallyDefineDataIdentifier.category</code>
[TPS_DEXT_01059]	Applicable values for <code>DiagnosticPeriodicRate.category</code>
[TPS_DEXT_01060]	Applicable values for <code>DiagnosticReadDTCInformation.category</code>
[TPS_DEXT_01061]	Supported scenarios for the definition of <i>access permission</i>
[TPS_DEXT_01062]	Existence of <code>DiagnosticServiceClass.accessPermissionValidity</code> in an incomplete model
[TPS_DEXT_01063]	Existence of <code>DiagnosticServiceClass.accessPermissionValidity</code> in a complete model
[TPS_DEXT_01064]	Textually formulated content attached to <code>DiagnosticTroubleCode</code>
[TPS_DEXT_01065]	Different approaches to provide semi-formal textual content attached to a <code>DiagnosticTroubleCode</code>
[TPS_DEXT_01066]	Standardized values of <code>DiagnosticTroubleCode.introduction.trace</code>
[TPS_DEXT_01067]	Textually formulated content attached to <code>DiagnosticEvent</code>
[TPS_DEXT_01068]	Textual description with respect to the <code>DiagnosticEvent</code>
[TPS_DEXT_01069]	Standardized values of <code>DiagnosticEvent.introduction.structuredReq</code>
[TPS_DEXT_01070]	Description of textually semi-formal formulated pre- and post-conditions for the validity of <code>DiagnosticAccessPermission</code>
[TPS_DEXT_01071]	Standardized values of <code>DiagnosticAccessPermission.introduction.structuredReq</code>
[TPS_DEXT_01072]	Purpose of attribute <code>DiagnosticDataIdentifier.representsVin</code>
[TPS_DEXT_01073]	Diagnostic properties that are specific to an individual <code>EcuInstance</code>
[TPS_DEXT_01074]	Difference between the attributes <code>DiagnosticComControl_specificChannel</code> and <code>DiagnosticComControl_subNodeChannel</code>



△

Number	Heading
[TPS_DEXT_01075]	standardized values for the attribute <code>DiagnosticControlDTCSetting.category</code>
[TPS_DEXT_01076]	Identification of sub-functions of diagnostic service <code>ControlDTCSetting</code>
[TPS_DEXT_01077]	Modeling of <code>DiagnosticRoutine</code>
[TPS_DEXT_01078]	Not possible to use the attribute <code>category</code> for the identification of the sub-function of diagnostic service <code>RoutineControl</code>
[TPS_DEXT_01079]	Modeling of the arguments to a <code>DiagnosticRoutine</code>
[TPS_DEXT_01080]	Diagnostic Routine needs to be started
[TPS_DEXT_01081]	Modeling of <code>DiagnosticSessionControl</code>
[TPS_DEXT_01082]	Existence of <code>DiagnosticSessionControl.diagnosticSession</code>
[TPS_DEXT_01083]	Semantics of a <code>DiagnosticEvent</code>
[TPS_DEXT_01084]	<code>DiagnosticEvent</code> can be connected to one or multiple indicators
[TPS_DEXT_01085]	Semantics of <code>DiagnosticConditionGroup</code> s
[TPS_DEXT_01086]	Reference to <code>DiagnosticOperationCycle</code>
[TPS_DEXT_01087]	Semantics of <code>DiagnosticOperationCycle</code>
[TPS_DEXT_01088]	Semantics of <code>DiagnosticRoutine.id</code>
[TPS_DEXT_01089]	Definition of an <i>identifier</i> of a <code>DiagnosticIOControl</code>
[TPS_DEXT_01090]	Diagnostic service <code>RequestFileTransfer</code> does not define any sub-functions
[TPS_DEXT_03000]	ISO 14229-1 reserves values of <code>DiagnosticTroubleCodeGroup.group-Number</code>
[TPS_DEXT_03001]	Different types of conditions
[TPS_DEXT_03002]	Two kind of mappings
[TPS_DEXT_03003]	Semantics of <code>DiagnosticEventToTroubleCodeUdsMapping</code>
[TPS_DEXT_03004]	<code>DiagnosticEvent</code> and <code>DiagnosticDebounceAlgorithmProps</code>
[TPS_DEXT_03005]	Existence of <code>DiagnosticEventToDebounceAlgorithmMapping</code>
[TPS_DEXT_03006]	Values of the individual <code>DiagnosticStorageConditions</code>
[TPS_DEXT_03007]	Semantics of <code>DiagnosticEventPortMapping</code>
[TPS_DEXT_03008]	Semantics of <code>DiagnosticExtendedDataRecord</code>
[TPS_DEXT_03009]	Semantics of <code>DiagnosticFreezeFrame</code>
[TPS_DEXT_03010]	Combination of <code>DiagnosticConditions</code> to <code>DiagnosticCondition-Groups</code>
[TPS_DEXT_03011]	Clearing request for a <code>DiagnosticEvent</code>
[TPS_DEXT_03012]	Three kinds of DTCs
[TPS_DEXT_03013]	Common properties of a DTC
[TPS_DEXT_03014]	Semantics of <code>DiagnosticTroubleCodeGroup</code>
[TPS_DEXT_03015]	EnableConditions have to be put into a <code>DiagnosticEnableCondition-Group</code>

▽

△

Number	Heading
[TPS_DEXT_03016]	StorageConditions have to be put into a DiagnosticStorageConditionGroup
[TPS_DEXT_03017]	Semantics of DiagnosticOperationCyclePortMapping
[TPS_DEXT_03018]	Semantics of DiagnosticEnableConditionPortMapping
[TPS_DEXT_03019]	Semantics of DiagnosticStorageConditionPortMapping
[TPS_DEXT_03020]	Semantics of DiagnosticDemProvidedDataMapping
[TPS_DEXT_03021]	Aging
[TPS_DEXT_03022]	Different kinds of DiagnosticIndicators

Table B.1: Added Specification Items in 4.2.1

B.1.2 Added Constraints in R4.2.1

Number	Heading
[constr_1324]	Existence of attribute DiagnosticDataIdentifier.representsVin
[constr_1325]	Allowed attributes of SwDataDefProps for DiagnosticDataElement.swDataDefProps
[constr_1326]	Existence of a variable-sized array
[constr_1327]	Multiplicity of DiagnosticContributionSet.ecuInstance
[constr_1328]	Consistency of DiagnosticContributionSet.ecuInstance and DiagnosticServiceTable.ecuInstance
[constr_1329]	Existence of concrete sub-classes of DiagnosticServiceClass in the context created by a DiagnosticContributionSet
[constr_1330]	Custom service identifier shall not overlap with standardized service identifiers
[constr_1331]	Existence of DiagnosticEcuReset.customSubFunctionNumber
[constr_1332]	Value range for DiagnosticEcuReset.customSubFunctionNumber
[constr_1333]	Existence of DiagnosticMemoryIdentifier.memoryLowAddress and DiagnosticMemoryIdentifier.memoryHighAddress
[constr_1334]	Existence of DiagnosticComControl.customSubFunctionNumber
[constr_1335]	Possible values for DiagnosticComControl.customSubFunctionNumber
[constr_1336]	Applicable value range for DiagnosticComControlSpecificChannel.subnetNumber
[constr_1337]	Allowed value range for attribute DiagnosticComControlSubNodeChannel.subNodeNumber
[constr_1338]	Maximum number of aggregated DiagnosticReadDataByPeriodicCIDClass.periodicRate
[constr_1339]	Existence of DiagnosticRoutine.start
[constr_1340]	Consistency of DiagnosticServiceSwMapping with respect to synchronously called DiagnosticRoutines
[constr_1341]	Consistency of DiagnosticServiceSwMapping with respect to asynchronously called DiagnosticRoutines

▽

△

Number	Heading
[constr_1342]	Possible values for <code>DiagnosticSecurityAccess.requestSeedId</code>
[constr_1343]	Simultaneous existence of the attributes <code>DiagnosticServiceDataMapping.diagnosticDataElement</code> and <code>DiagnosticDataByIdentifier.dataIdentifier</code>
[constr_1344]	Condition for the identification of data types of attributes <code>DiagnosticServiceDataMapping.mappedDataElement</code> and <code>DiagnosticServiceDataMapping.diagnosticDataElement</code>
[constr_1345]	<code>DiagnosticDataElement</code> shall not (finally) be aggregated by a <code>DiagnosticRoutine</code>
[constr_1346]	Allowed values of <code>DiagnosticServiceSwMapping.serviceInstance</code>
[constr_1347]	Existence of attributes of <code>DiagnosticServiceSwMapping</code>
[constr_1349]	Value of <code>udsDtcValue</code> shall be unique
[constr_1350]	Value of <code>DiagnosticTroubleCodeGroup.groupNumber</code> shall be unique
[constr_1351]	Value of <code>DiagnosticTroubleCodeGroup.groupNumber</code>
[constr_1352]	Existence of <code>maxNumberFreezeFrameRecords</code> vs. <code>freezeFrame</code>
[constr_1353]	Applicability of [constr_1352]
[constr_1354]	Existence of attribute <code>DiagnosticTroubleCodeProps.freezeFrameContent</code>
[constr_1355]	Value of <code>recordNumber</code>
[constr_1356]	Value of <code>recordNumber</code> shall be unique
[constr_1357]	Value of <code>recordNumber</code>
[constr_1358]	Value of <code>recordNumber</code> shall be unique
[constr_1359]	Existence of attribute <code>DiagnosticDebounceAlgorithmProps.debounceCounterStorage</code>
[constr_1360]	Usage of <code>DiagEventDebounceMonitorInternal</code> is not supported in the context of <code>DiagnosticDebounceAlgorithmProps</code>
[constr_1361]	Number of <code>DiagnosticEventToEnableConditionGroupMapping</code> elements per <code>DiagnosticEvent</code>
[constr_1362]	Number of <code>DiagnosticEventToStorageConditionGroupMapping</code> elements per <code>DiagnosticEvent</code>
[constr_1365]	Multiplicity of <code>DiagnosticResponseOnEvent.event</code>
[constr_1366]	Event ID in the context of diagnostic service <code>ResponseOnEvent</code> shall be unique
[constr_1376]	Multiplicity of reference <code>DiagnosticTroubleCodeProps.memoryDestination</code>
[constr_1377]	Existence of reference <code>DiagnosticTroubleCodeProps.memoryDestination</code>
[constr_1378]	Value of <code>DiagnosticMemoryDestinationUserDefined.memoryId</code>
[constr_1379]	Existence of <code>DiagnosticMemoryDestinationPrimary</code>
[constr_1380]	Existence of <code>DiagnosticMemoryDestinationMirror</code>

Table B.2: Added Constraints in R4.2.1

B.2 Constraint History of this Document according to AUTOSAR R4.2.2

B.2.1 Added Traceables in R4.2.2

none

B.2.2 Changed Traceables in R4.2.2

none

B.2.3 Deleted Traceables in R4.2.2

none

B.2.4 Added Constraints in R4.2.2

Number	Heading
[constr_1394]	Value of <code>DiagnosticDataElement.maxNumberOfElements</code> depending on its existence

Table B.3: Added Constraints in R4.2.2

B.2.5 Changed Constraints in R4.2.2

none

B.2.6 Deleted Constraints in R4.2.2

none

B.3 Constraint History of this Document according to AUTOSAR R4.3.0

B.3.1 Added Traceables in R4.3.0

Number	Heading
[TPS_DEXT_01091]	Relation between a DiagnosticServiceTable and one or more DiagnosticConnections
[TPS_DEXT_01092]	Semantics of DiagnosticParameterIdentifier
[TPS_DEXT_01093]	Definition of legislative freeze frame for WWH-OBD
[TPS_DEXT_01094]	Semantics of meta-class DiagnosticTroubleCodeUdsToTroubleCodeObdMapping
[TPS_DEXT_01095]	Definition of “alias” diagnostic event for the creation of a Fim configuration in the diagnostic extract
[TPS_DEXT_01096]	Semantics of DiagnosticFunctionInhibitSource
[TPS_DEXT_01097]	Standardized value of StructuredReq.category for the modeling of DiagnosticFunctionInhibitSource
[TPS_DEXT_01098]	Semantics of attribute DiagnosticFunctionInhibitSource.event
[TPS_DEXT_01099]	Semantics of attribute DiagnosticFunctionInhibitSource.eventGroup
[TPS_DEXT_01100]	Consequence of the existence of DiagnosticFimAliasEventMapping
[TPS_DEXT_01101]	Consequence of the existence of DiagnosticFimAliasEventGroupMapping
[TPS_DEXT_01102]	Semantics of DiagnosticFimFunctionMapping
[TPS_DEXT_01103]	Semantics of meta-class DiagnosticJ1939SpnMapping
[TPS_DEXT_01104]	Difference between DiagnosticJ1939FreezeFrame and DiagnosticJ1939ExpandedFreezeFrame
[TPS_DEXT_01105]	Relation of DiagnosticJ1939Spn to DiagnosticJ1939FreezeFrame and DiagnosticJ1939ExpandedFreezeFrame
[TPS_DEXT_01106]	Relation of Controller Application to SPN
[TPS_DEXT_01107]	Definition of service-only DTC
[TPS_DEXT_01108]	Purpose of the DiagnosticJ1939SwMapping
[TPS_DEXT_01110]	Standardized values of DiagnosticIumprGroup.category
[TPS_DEXT_01111]	Legislative freeze frame for the OBD-II case
[TPS_DEXT_01112]	Definition of a diagnostic trouble code for the implementation of WWH-OBD
[TPS_DEXT_01113]	Evaluation of a DiagnosticEnvConditionFormula
[TPS_DEXT_01114]	DiagnosticEnvConditionFormula that has no parts
[TPS_DEXT_01115]	DiagnosticEnvConditionFormula that has one part
[TPS_DEXT_01116]	DiagnosticEnvConditionFormula that has more than one part
[TPS_DEXT_01117]	Semantics of DiagnosticEnvConditionFormula.nrcValue
[TPS_DEXT_01118]	Semantics of DiagnosticEnvDataCondition
[TPS_DEXT_01119]	Semantics of DiagnosticEnvModeCondition



△

Number	Heading
[TPS_DEXT_01120]	Comparison of the value of a <code>ModeDeclarationGroupPrototype</code> with a <code>ModeDeclaration</code>
[TPS_DEXT_01121]	Semantics of <code>DiagnosticFunctionIdentifier</code>
[TPS_DEXT_01122]	Indication whether a <code>EcuInstance</code> supports OBD
[TPS_DEXT_01124]	Semantics of meta-class <code>DiagnosticProtocol</code>
[TPS_DEXT_01125]	Support for diagnostic service <code>RequestCurrentPowertrainDiagnosticData</code>
[TPS_DEXT_01126]	Support of OBD service <code>RequestPowertrainFreezeFrameData</code>
[TPS_DEXT_01127]	Semantics of meta-class <code>DiagnosticRequestEmissionRelatedDTC</code>
[TPS_DEXT_01128]	Semantics of meta-class <code>DiagnosticClearResetEmissionRelatedInfo</code>
[TPS_DEXT_01129]	Support for OBD diagnostic service <code>RequestOnBoardMonitoringTestResults</code>
[TPS_DEXT_01130]	Support of OBD diagnostic service <code>RequestControlOfOnBoardDevice</code>
[TPS_DEXT_01131]	Support for OBD diagnostic service <code>RequestVehicleInformation</code>
[TPS_DEXT_01132]	Support for OBD diagnostic service <code>RequestEmissionRelatedDiagnosticTroubleCodesPermanentStatus</code>
[TPS_DEXT_01133]	Support for WWH-OBD within the diagnostic extract
[TPS_DEXT_01134]	Definition of a <code>DiagnosticDataElement</code> used in the context of a DID obtained by sender-receiver communication
[TPS_DEXT_01135]	Definition of a <code>DiagnosticDataElement</code> used in the context of a DID obtained by client/server communication
[TPS_DEXT_01136]	Definition of a <code>DiagnosticDataElement</code> used in the context of a diagnostic routine
[TPS_DEXT_01137]	Applicability of <code>DiagnosticDataIdentifier.didSize</code>
[TPS_DEXT_01138]	Applicability of <code>DiagnosticDataIdentifier.supportInfoByte</code>
[TPS_DEXT_01139]	Semantics of the references from <code>DiagnosticAccessPermission</code>

Table B.4: Added Traceables in 4.3.0

B.3.2 Changed Traceables in R4.3.0

Number	Heading
[TPS_DEXT_01006]	The role of <code>DiagnosticServiceTables</code>
[TPS_DEXT_01052]	Existence of attribute <code>DiagnosticServiceInstance.accessPermission</code>
[TPS_DEXT_01060]	Applicable values for <code>DiagnosticReadDTCInformation.category</code>
[TPS_DEXT_01074]	Difference between the attributes <code>DiagnosticComControlClass.specifcChannel</code> and <code>DiagnosticComControlClass.subNodeChannel</code>
[TPS_DEXT_03003]	Semantics of <code>DiagnosticEventToTroubleCodeUdsMapping</code>

Table B.5: Changed Traceables in R4.3.0

B.3.3 Deleted Traceables in R4.3.0

Number	Heading
[TPS_DEXT_01058]	Standardized values for <code>DiagnosticDynamicallyDefineDataIdentifier.category</code>
[TPS_DEXT_01059]	Applicable values for <code>DiagnosticPeriodicRate.category</code>

Table B.6: Deleted Traceables in R4.3.0

B.3.4 Added Constraints in R4.3.0

Number	Heading
[constr_1405]	Value of <code>DiagnosticProtocol.serviceTable</code> vs. <code>DiagnosticServiceTable.protocolKind</code>
[constr_1406]	<code>DiagnosticServiceTable.diagnosticConnection</code> vs. <code>DiagnosticProtocol.diagnosticConnection</code>
[constr_1411]	Existence of <code>DiagnosticMemoryIdentifier.memoryHighAddressLabel</code> vs. <code>DiagnosticMemoryIdentifier.memoryHighAddress</code>
[constr_1412]	Existence of <code>DiagnosticMemoryIdentifier.memoryLowAddressLabel</code> vs. <code>DiagnosticMemoryIdentifier.memoryLowAddress</code>
[constr_1419]	Value of <code>DiagnosticSecurityLevel.accessDataRecordSize</code>
[constr_1421]	Consistency of <code>DiagnosticDynamicallyDefineDataIdentifierClass.subfunction</code>
[constr_1435]	Debouncing in the presence of a <code>DiagnosticEventPortMapping</code>
[constr_1447]	Restrictions for the value of <code>DiagnosticParameterIdentifier.id</code>
[constr_1448]	Interval of <code>DiagnosticParameterIdentifier.id</code>
[constr_1449]	PID shall only carry a fixed-length collection of data
[constr_1450]	Service mapping for ODB mode 0x01 for <code>DiagnosticParameterIdentifier</code>
[constr_1451]	Service mapping for OBD mode 0x09 for <code>DiagnosticInfoType</code>
[constr_1452]	Service mapping for OBD mode 0x08 for <code>DiagnosticInfoType</code>
[constr_1453]	References from <code>DiagnosticFunctionInhibitSource</code>
[constr_1454]	<code>DiagnosticFimFunctionMapping</code> shall only reference a <code>SwcServiceDependency</code> that aggregates <code>FunctionInhibitionNeeds</code>
[constr_1455]	Relation of <code>DiagnosticJ1939Node</code> to <code>J1939NmNode</code>
[constr_1456]	Valid interval for attribute <code>DiagnosticTroubleCodeJ1939.fmi</code>
[constr_1457]	Service-only DTCs shall refer to a common memory section
[constr_1458]	Reference to <code>DiagnosticMemoryDestination</code>
[constr_1459]	Existence of attributes of <code>DiagnosticTroubleCodeProps</code>
[constr_1460]	Restrictions for the value of <code>DiagnosticInfoType.id</code>
[constr_1461]	Restrictions for the value of <code>DiagnosticTestRoutineIdentifier.id</code>
[constr_1462]	Restrictions for the value of <code>DiagnosticTestResult.testIdentifier.id</code>
[constr_1464]	Allowed value range of <code>DiagnosticEnvConditionFormula.nrcValue</code>
[constr_1465]	Allowed values of <code>compareType</code> in the context of a <code>DiagnosticEnvDataCondition</code>



△

Number	Heading
[constr_1466]	Allowed values of <code>compareType</code> in the context of a <code>DiagnosticEnvModeCondition</code>
[constr_1467]	References in <code>DiagnosticEnvModeCondition</code>
[constr_1470]	Value of <code>DiagnosticParameter.bitOffset</code>
[constr_1471]	Existence of <code>DiagnosticDataIdentifier.didSize</code>
[constr_1472]	Existence of <code>DiagnosticDataIdentifier.supportInfoByte</code>

Table B.7: Added Constraints in R4.3.0

B.3.5 Changed Constraints in R4.3.0

Number	Heading
[constr_1325]	Allowed attributes of <code>SwDataDefProps</code> for <code>DiagnosticDataElement.swDataDefProps</code>
[constr_1327]	Multiplicity of <code>DiagnosticEcuInstanceProps.ecuInstance</code>
[constr_1328]	Consistency of <code>DiagnosticEcuInstanceProps.ecuInstance</code> and <code>DiagnosticServiceTable.ecuInstance</code>

Table B.8: Changed Constraints in R4.3.0

B.3.6 Deleted Constraints in R4.3.0

none

B.4 Constraint History of this Document according to AUTOSAR R4.3.1

B.4.1 Added Traceables in 4.3.1

Number	Heading
[TPS_DEXT_01140]	Values contained in <code>DiagnosticExtract</code> shall be taken for the derivation of basic software modules

Table B.9: Added Traceables in 4.3.1

B.4.2 Changed Traceables in 4.3.1

Number	Heading
[TPS_DEXT_01087]	Semantics of <code>DiagnosticOperationCycle</code>

Table B.10: Changed Traceables in 4.3.1

B.4.3 Deleted Traceables in 4.3.1

Number	Heading
[TPS_DEXT_01073]	Diagnostic properties that are specific to an individual <code>EcuInstance</code>

Table B.11: Deleted Traceables in 4.3.1

B.4.4 Added Constraints in 4.3.1

Number	Heading
[constr_1509]	<code>extendedDataRecord.recordNumber</code> shall be unique within primary fault memory
[constr_1510]	<code>extendedDataRecord.recordNumber</code> shall be unique within mirror fault memory
[constr_1511]	<code>extendedDataRecord.recordNumber</code> shall be unique within user-defined fault memory
[constr_1512]	<code>freezeFrame.recordNumber</code> shall be unique within primary fault memory
[constr_1513]	<code>freezeFrame.recordNumber</code> shall be unique within mirror fault memory
[constr_1514]	<code>freezeFrame.recordNumber</code> shall be unique within user-defined fault memory
[constr_1515]	Reference from <code>DiagnosticRoutineControl</code> to <code>DiagnosticAccessPermission</code> has no meaning

Table B.12: Added Constraints in 4.3.1

B.4.5 Changed Constraints in 4.3.1

Number	Heading
[constr_1325]	Allowed attributes of <code>SwDataDefProps</code> for <code>DiagnosticDataElement.swDataDefProps</code>
[constr_1450]	Service mapping for ODB mode 0x01 for <code>DiagnosticParameterIdentifier</code>
[constr_1451]	Service mapping for OBD mode 0x09 for <code>DiagnosticInfoType</code>

Table B.13: Changed Constraints in 4.3.1

B.4.6 Deleted Constraints in 4.3.1

Number	Heading
[constr_1356]	Value of <code>recordNumber</code> shall be unique
[constr_1358]	Value of <code>recordNumber</code> shall be unique

Table B.14: Deleted Constraints in 4.3.1

B.5 Constraint History of this Document according to AUTOSAR R4.4.0

B.5.1 Added Traceables in 4.4.0

Number	Heading
[TPS_DEXT_01141]	Definition of a collection of test results
[TPS_DEXT_01142]	Standardized values for <code>DiagnosticDemProvidedDataMapping.dataProvider</code>
[TPS_DEXT_01143]	Definition of a custom trigger for an extended data record
[TPS_DEXT_01144]	Definition of a custom trigger for a freeze frame
[TPS_DEXT_01145]	Semantics of meta-class <code>DiagnosticEventToTroubleCodeJ1939Mapping</code>
[TPS_DEXT_01146]	Support for service <code>ReadScalingDataByIdentifier</code> (0x24)

Table B.15: Added Traceables in 4.4.0

B.5.2 Changed Traceables in 4.4.0

Number	Heading
[TPS_DEXT_01004]	<code>DiagnosticContributionSet</code> defines the scope of the <code>DiagnosticExtract</code>
[TPS_DEXT_01041]	Semantics of attribute <code>DiagnosticServiceDataMapping.diagnosticDataElement</code>
[TPS_DEXT_01055]	Standardized values of <code>DiagnosticContributionSet.category</code>
[TPS_DEXT_01079]	Modeling of the arguments to a <code>DiagnosticRoutine</code>
[TPS_DEXT_03011]	Clearing request for a <code>DiagnosticEvent</code>
[TPS_DEXT_03020]	Semantics of <code>DiagnosticDemProvidedDataMapping</code>

Table B.16: Changed Traceables in 4.4.0

B.5.3 Deleted Traceables in 4.4.0

Number	Heading
[TPS_DEXT_01137]	Applicability of <code>DiagnosticDataIdentifier.didSize</code>

Table B.17: Deleted Traceables in 4.4.0

B.5.4 Added Constraints in 4.4.0

Number	Heading
[constr_1552]	<code>DiagnosticDataIdentifier</code> referenced by <code>DiagnosticDataIdentifierSet</code>
[constr_1584]	<code>DiagnosticDataElement</code> shall not be used more than once in I/O Control instance



△

Number	Heading
[constr_1590]	DiagnosticEvent referenced in the role <code>masterEvent</code> or <code>slaveEvent</code>
[constr_1591]	DiagnosticEvent referenced as <code>slaveEvent</code> shall not be reported by diagnostic monitor
[constr_1612]	Reference from <code>DiagnosticRoutineControl</code> to <code>DiagnosticAccessPermission</code> has no meaning
[constr_1616]	Existence of attribute <code>DiagnosticExtendedDataRecord.customTrigger</code>
[constr_1617]	Existence of attribute <code>DiagnosticFreezeFrame.customTrigger</code>
[constr_1623]	Restriction on <code>DiagnosticReadScalingDataByIdentifier.dataIdentifier</code>
[constr_1624]	Existence of <code>DiagnosticDataElement.scalingInfoSize</code>
[constr_1633]	Existence of <code>DiagnosticResponseOnEvent.event</code> vs. <code>DiagnosticResponseOnEvent.responseOnEventAction</code>

Table B.18: Added Constraints in 4.4.0

B.5.5 Changed Constraints in 4.4.0

Number	Heading
[constr_1325]	Allowed attributes of <code>SwDataDefProps</code> for <code>DiagnosticDataElement.swDataDefProps</code>
[constr_1328]	Consistency of <code>DiagnosticEcuInstanceProps.ecuInstance</code> and <code>DiagnosticServiceTable.ecuInstance</code>

Table B.19: Changed Constraints in 4.4.0

B.5.6 Deleted Constraints in 4.4.0

Number	Heading
[constr_1471]	Existence of <code>DiagnosticDataIdentifier.didSize</code>
[constr_1515]	Reference from <code>DiagnosticRoutineControl</code> to <code>DiagnosticAccessPermission</code> has no meaning

Table B.20: Deleted Constraints in 4.4.0

B.6 Constraint History of this Document according to AUTOSAR R19-11

B.6.1 Added Traceables in 19-11

Number	Heading
[TPS_DEXT_01147]	Support for custom service instance
[TPS_DEXT_01148]	Standardized values of <code>DiagnosticIumprGroup.category</code>
[TPS_DEXT_01149]	Standardized values of <code>DiagnosticIumprDenominatorGroup.category</code>
[TPS_DEXT_01150]	Semantics of meta-class <code>DiagnosticControlEnableMaskBit</code>

Table B.21: Added Traceables in 19-11

B.6.2 Changed Traceables in 19-11

Number	Heading
[TPS_DEXT_01060]	Applicable values for <code>DiagnosticReadDTCInformation.category</code>
[TPS_DEXT_01134]	Definition of a <code>DiagnosticDataElement</code> used in the context of a DID obtained by sender-receiver communication
[TPS_DEXT_01135]	Definition of a <code>DiagnosticDataElement</code> used in the context of a DID obtained by client/server communication
[TPS_DEXT_01136]	Definition of a <code>DiagnosticDataElement</code> used in the context of a diagnostic routine

Table B.22: Changed Traceables in 19-11

B.6.3 Deleted Traceables in 19-11

Number	Heading
[TPS_DEXT_01009]	Limited support for the configuration of custom diagnostic services
[TPS_DEXT_01010]	Configuration of custom diagnostic services
[TPS_DEXT_01110]	Standardized values of <code>DiagnosticIumprGroup.category</code>

Table B.23: Deleted Traceables in 19-11

B.6.4 Added Constraints in 19-11

Number	Heading
[constr_1711]	Restriction of applicability of attribute <code>typeOfFreezeFrameRecordNumeration</code>
[constr_1721]	<code>DiagnosticControlEnableMaskBit.bitNumber</code> shall be unique
[constr_1722]	Relation between reference <code>DiagnosticIOControl.dataIdentifier</code> and attribute <code>DiagnosticIOControl.controlEnableMaskBit</code>



△

Number	Heading
[constr_1725]	Applicability of attribute <code>DiagnosticMemoryDestination.dtcStatusAvailabilityMask</code>

Table B.24: Added Constraints in 19-11

B.6.5 Changed Constraints in 19-11

Number	Heading
[constr_1344]	Condition for the identification of data types of attributes <code>DiagnosticService-DataMapping.mappedDataElement</code>
[constr_1349]	Value of <code>udsDtcValue</code> shall be unique
[constr_1354]	Existence of attribute <code>DiagnosticTroubleCodeProps.snapshotRecordContent</code>
[constr_1459]	Existence of attributes of <code>DiagnosticTroubleCodeProps</code>

Table B.25: Changed Constraints in 19-11

B.6.6 Deleted Constraints in 19-11

none

B.7 Constraint History of this Document according to AUTOSAR R20-11

B.7.1 Added Traceables in R20-11

Number	Heading
[TPS_DEXT_01151]	Semantics of attribute <code>DiagnosticEvent.associatedEventIdentification</code>
[TPS_DEXT_01152]	Semantics of meta-class <code>DiagnosticSecurityEventReporting-ModeMapping</code>
[TPS_DEXT_01153]	Semantics of meta-class <code>DiagnosticEventToSecurityEventMapping</code>

Table B.26: Added Traceables in R20-11

B.7.2 Changed Traceables in R20-11

Number	Heading
[TPS_DEXT_01041]	Semantics of attribute <code>DiagnosticServiceDataMapping.diagnostic-DataElement</code>

▽



Number	Heading
[TPS_DEXT_01142]	Standardized values for <code>DiagnosticDemProvidedDataMapping.dataProvider</code>

Table B.27: Changed Traceables in R20-11

B.7.3 Deleted Traceables in R20-11

Number	Heading
[TPS_DEXT_01052]	Existence of attribute <code>DiagnosticServiceInstance.accessPermission</code>
[TPS_DEXT_01061]	Supported scenarios for the definition of <i>access permission</i>
[TPS_DEXT_01062]	Existence of <code>DiagnosticServiceClass.accessPermissionValidity</code> in an incomplete model
[TPS_DEXT_01063]	Existence of <code>DiagnosticServiceClass.accessPermissionValidity</code> in a complete model
[TPS_DEXT_01076]	Identification of sub-functions of diagnostic service <code>ControlDTCSetting</code>

Table B.28: Deleted Traceables in R20-11

B.7.4 Added Constraints in R20-11

Number	Heading
[constr_1745]	Indirect reference to <code>DiagnosticCommonElement</code>
[constr_1749]	Existence of <code>DiagnosticInfoType.dataElement</code>
[constr_1750]	Existence of attribute <code>DiagnosticParameterIdentifier.pidSize</code>
[constr_1752]	Existence of references owned by <code>DiagnosticEnableConditionPortMapping</code>
[constr_1753]	Existence of references owned by <code>DiagnosticStorageConditionPortMapping</code>
[constr_1756]	Existence of attributes <code>DiagnosticExtendedDataRecord.trigger</code> and <code>update</code>
[constr_1757]	Existence of attribute <code>DiagnosticTroubleCodeUds.udsDtcValue</code>
[constr_1758]	Existence of attribute <code>DiagnosticTroubleCodeObd.obdDTCValue</code>
[constr_1759]	Existence of references owned by <code>DiagnosticOperationCyclePortMapping</code>
[constr_1760]	Existence of <code>DiagnosticExtendedDataRecord.recordElement</code>
[constr_1761]	Existence of attribute <code>DiagnosticConnectedIndicator.healingCycle</code>
[constr_1762]	Existence of references owned by <code>DiagnosticEventPortMapping</code>
[constr_1763]	Existence of attribute <code>DiagnosticPeriodicRate.periodicRateCategory</code>
[constr_1766]	Existence of <code>DiagEventDebounceCounterBased.counterJumpDownValue</code>
[constr_1767]	Existence of <code>DiagEventDebounceCounterBased.counterJumpUpValue</code>
[constr_1768]	Existence of attribute <code>DiagnosticEvent.associatedEventIdentification</code>
[constr_1772]	Unique <code>DiagnosticSession</code> and <code>DiagnosticSecurityLevel</code> for diagnostic routines that have the same identifier
[constr_1780]	Existence of attribute <code>DiagnosticTroubleCodeJ1939.fmi</code>





Number	Heading
[constr_1781]	Existence of attribute <code>DiagnosticTroubleCodeJ1939.spn</code>
[constr_1782]	Usage of internal data elements only for extended data records
[constr_1790]	Existence of attribute <code>DiagnosticParameter.bitOffset</code>
[constr_1791]	Existence of attribute <code>DiagnosticParameter.dataElement</code>
[constr_1792]	Existence of <code>DiagnosticDataIdentifier.dataElement</code>
[constr_1793]	Existence of attribute <code>DiagnosticAbstractDataIdentifier.id</code>
[constr_1794]	Existence of attribute <code>DiagnosticProtocol.priority</code>
[constr_1795]	Existence of attribute <code>DiagnosticProtocol.protocolKind</code>
[constr_1796]	Existence of attribute <code>DiagnosticServiceTable.serviceInstance</code>
[constr_1797]	Existence of attribute <code>DiagnosticServiceTable.protocolKind</code>
[constr_1798]	Existence of <code>DiagnosticServiceInstance.serviceClass</code>
[constr_1799]	Existence of <code>DiagnosticEnvironmentalCondition.formula</code>
[constr_1800]	Existence of <code>DiagnosticEnvConditionFormula.op</code>
[constr_1801]	Existence of <code>DiagnosticEnvCompareCondition.compareType</code>
[constr_1802]	Existence of <code>DiagnosticEnvDataCondition.compareValue</code>
[constr_1803]	Existence of <code>DiagnosticEnvDataCondition.dataElement</code>
[constr_1804]	Existence of <code>DiagnosticEnvModeCondition.modeElement</code>
[constr_1805]	Existence of <code>DiagnosticEnvSwcModeElement.mode</code>
[constr_1806]	Existence of <code>DiagnosticEnvBswModeElement.mode</code>
[constr_1807]	Existence of reference <code>DiagnosticDataByIdentifier.dataIdentifier</code>
[constr_1808]	Existence of reference <code>DiagnosticDynamicallyDefineDataIdentifier.dataIdentifier</code>
[constr_1810]	Existence of aggregation <code>DiagnosticReadDataByPeriodicIDClass.periodicRate</code>
[constr_1811]	Existence of attribute <code>DiagnosticReadDataByPeriodicIDClass.maxPeriodicDidToRead</code>
[constr_1812]	Existence of attribute <code>DiagnosticReadDataByPeriodicIDClass.schedulerMaxNumber</code>
[constr_1813]	Existence of reference <code>DiagnosticEventWindow.eventWindowTime</code>
[constr_1814]	Existence of reference <code>DiagnosticEventWindow.storageStateEvaluation</code>
[constr_1815]	Existence of attribute <code>DiagnosticRoutine.id</code>
[constr_1816]	Existence of attribute <code>DiagnosticSecurityAccess.requestSeedId</code>
[constr_1817]	Existence of attribute <code>DiagnosticSecurityAccess.securityLevel</code>
[constr_1818]	Existence of reference <code>DiagnosticSessionControl.diagnosticSession</code>
[constr_1819]	Existence of attribute <code>DiagnosticParameterIdentifier.id</code>
[constr_1820]	Existence of reference <code>DiagnosticRequestCurrentPowertrainData.pid</code>
[constr_1821]	Existence of reference <code>DiagnosticRequestPowertrainFreezeFrameData.freezeFrame</code>
[constr_1822]	Existence of reference <code>DiagnosticRequestControlOfOnBoardDevice.testId</code>



△

Number	Heading
[constr_1823]	Existence of attribute <code>DiagnosticTestRoutineIdentifier.id</code>
[constr_1824]	Existence of attribute <code>DiagnosticTestRoutineIdentifier.requestDataSize</code>
[constr_1825]	Existence of attribute <code>DiagnosticTestRoutineIdentifier.responseDataSize</code>
[constr_1826]	Existence of reference <code>DiagnosticRequestVehicleInfo.infoType</code>
[constr_1827]	Existence of attribute <code>DiagnosticInfoType.id</code>
[constr_1828]	Existence of referenced from <code>DiagnosticServiceDataMapping</code>
[constr_1829]	Existence of reference <code>DiagnosticConnectedIndicator.indicator</code>
[constr_1830]	Existence of <code>DiagnosticTroubleCodeGroup.groupNumber</code>
[constr_1831]	Existence of <code>DiagnosticTroubleCodeProps.priority</code>
[constr_1832]	Existence of <code>DiagnosticExtendedDataRecord.recordNumber</code>
[constr_1833]	Existence of <code>DiagnosticFreezeFrame.trigger</code>
[constr_1834]	Existence of <code>DiagnosticCondition.initValue</code>
[constr_1835]	Existence of <code>DiagEventDebounceCounterBased.counterDecrementStepSize</code>
[constr_1836]	Existence of <code>DiagEventDebounceCounterBased.counterIncrementStepSize</code>
[constr_1837]	Existence of <code>DiagEventDebounceCounterBased.counterFailedThreshold</code>
[constr_1838]	Existence of <code>DiagEventDebounceCounterBased.counterPassedThreshold</code>
[constr_1839]	Existence of attribute <code>DiagEventDebounceTimeBased.timeFailedThreshold</code>
[constr_1840]	Existence of attribute <code>DiagEventDebounceTimeBased.timePassedThreshold</code>
[constr_1841]	Existence of <code>DiagnosticEnableConditionGroup.enableCondition</code>
[constr_1842]	Existence of <code>DiagnosticStorageConditionGroup.storageCondition</code>
[constr_1843]	Existence of reference <code>DiagnosticEventPortMapping.diagnosticEvent</code>
[constr_1844]	Existence of reference <code>DiagnosticOperationCyclePortMapping.operationCycle</code>
[constr_1845]	Existence of reference <code>DiagnosticEnableConditionPortMapping.enableCondition</code>
[constr_1846]	Existence of reference <code>DiagnosticStorageConditionPortMapping.diagnosticStorageCondition</code>
[constr_1847]	Existence of reference <code>DiagnosticDemProvidedDataMapping.dataElement</code>
[constr_1848]	Existence of attribute <code>DiagnosticAging.agingCycle</code>
[constr_1849]	Existence of attribute <code>DiagnosticAging.threshold</code>
[constr_1850]	Existence of aggregation <code>DiagnosticTestResult.testIdentifier</code>
[constr_1851]	Existence of reference <code>DiagnosticTestResult.monitoredIdentifier</code>
[constr_1852]	Existence of attribute <code>DiagnosticEcuInstanceProps.obdSupport</code>
[constr_1853]	Existence of attribute <code>DiagnosticIumprGroup.iumprGroupIdentifier</code>
[constr_1854]	Existence of attribute <code>DiagnosticIumprGroupIdentifier.groupId</code>
[constr_1855]	Existence of attribute <code>DiagnosticFunctionIdentifierInhibit.inhibitionMask</code>

▽

△

Number	Heading
[constr_1856]	Existence of attribute <code>DiagnosticJ1939Spn.spn</code>
[constr_1857]	Existence of the reference <code>DiagnosticEventToTroubleCodeJ1939Mapping.diagnosticEvent</code>
[constr_1858]	Existence of the attribute <code>DiagnosticEventToTroubleCodeJ1939Mapping.troubleCodeJ1939</code>
[constr_1859]	Usage of <code>DiagnosticRecordTriggerEnum.testFailedThisOperationCycle</code>
[constr_10024]	Existence of reference in the role <code>DiagnosticSecurityEventReportingModeMapping.dataElement</code>
[constr_10025]	Existence of reference in the role <code>DiagnosticSecurityEventReportingModeMapping.securityEvent</code>
[constr_10026]	Existence of reference in the role <code>DiagnosticEventToSecurityEventMapping.diagnosticEvent</code>
[constr_10027]	Existence of reference in the role <code>DiagnosticEventToSecurityEventMapping.securityEventProps</code>

Table B.29: Added Constraints in R20-11

B.7.5 Changed Constraints in R20-11

none

B.7.6 Deleted Constraints in R20-11

Number	Heading
[constr_1360]	Usage of <code>DiagEventDebounceMonitorInternal</code> is not supported in the context of <code>DiagnosticDebounceAlgorithmProps</code>

Table B.30: Deleted Constraints in R20-11

C Glossary

Artifact This is a Work Product Definition that provides a description and definition for tangible work product types. Artifacts may be composed of other artifacts ([23]).

At a high level, an artifact is represented as a single conceptual file.

AUTOSAR Tool This is a software tool which supports one or more tasks defined as AUTOSAR tasks in the methodology. Depending on the supported tasks, an AUTOSAR tool can act as an authoring tool, a converter tool, a processor tool or as a combination of those (see separate definitions).

AUTOSAR Authoring Tool An AUTOSAR Tool used to create and modify AUTOSAR XML Descriptions. Example: System Description Editor.

AUTOSAR Converter Tool An AUTOSAR Tool used to create AUTOSAR XML files by converting information from other AUTOSAR XML files. Example: ECU Flattener

AUTOSAR Definition This is the definition of parameters which can have values. One could say that the parameter values are Instances of the definitions. But in the meta model hierarchy of AUTOSAR, definitions are also instances of the meta model and therefore considered as a description. Examples for AUTOSAR definitions are: EcucParameterDef, PostBuildVariantCriterion, SwSystemConst.

AUTOSAR XML Description In AUTOSAR this means "filled Template". In fact an AUTOSAR XML description is the XML representation of an AUTOSAR model.

The AUTOSAR XML description can consist of several files. Each individual file represents an AUTOSAR partial model and shall validate successfully against the AUTOSAR XML schema.

AUTOSAR Meta-Model This is an UML2.0 model that defines the language for describing AUTOSAR systems. The AUTOSAR meta-model is an UML representation of the AUTOSAR templates. UML2.0 class diagrams are used to describe the attributes and their interrelationships. Stereotypes, UML tags and OCL expressions (object constraint language) are used for defining specific semantics and constraints.

AUTOSAR Meta-Model Tool The AUTOSAR Meta-Model Tool is the tool that generates different views (class tables, list of constraints, diagrams, XML Schema etc.) on the AUTOSAR meta-model.

AUTOSAR Model This is a representation of an AUTOSAR product. The AUTOSAR model represents aspects suitable to the intended use according to the AUTOSAR methodology.

Strictly speaking, this is an instance of the AUTOSAR meta-model. The information contained in the AUTOSAR model can be anything that is representable according to the AUTOSAR meta-model.

AUTOSAR Partial Model In AUTOSAR, the possible partitioning of models is marked in the meta-model by <<atpSplittable>>. One partial model is represented in an AUTOSAR XML description by one file. The partial model does not need to fulfill all semantic constraints applicable to an AUTOSAR model.

AUTOSAR Processor Tool An AUTOSAR Tool used to create non-AUTOSAR files by processing information from AUTOSAR XML files. Example: RTE Generator

AUTOSAR Specification Element An AUTOSAR Specification Element is a named element that is part of an AUTOSAR specification. Examples: requirement, constraint, specification item, class or attribute in the meta model, methodology, deliverable, methodology activity, model element, bsw module etc.

AUTOSAR Template The term "Template" is used in AUTOSAR to describe the format different kinds of descriptions. The term template comes from the idea, that

AUTOSAR defines a kind of form which shall be filled out in order to describe a model. The filled form is then called the description.

In fact the AUTOSAR templates are now defined as a meta-model.

AUTOSAR Validation Tool A specialized AUTOSAR Tool which is able to check an AUTOSAR model against the rules defined by a profile.

AUTOSAR XML Schema This is a W3C XML schema that defines the language for exchanging AUTOSAR models. This Schema is derived from the AUTOSAR meta-model. The AUTOSAR XML Schema defines the AUTOSAR data exchange format.

Blueprint This is a model from which other models can be derived by copy and refinement. Note that in contrast to meta model resp. types, this process is *not* an instantiation.

Instance Generally this is a particular exemplar of a model or of a type.

Life Cycle Life Cycle is the course of development/evolutionary stages of a model element during its life time.

Meta-Model This defines the building blocks of a model. In that sense, a Meta-Model represents the language for building models.

Meta-Data This includes pertinent information about data, including information about the authorship, versioning, access-rights, timestamps etc.

Model A Model is an simplified representation of reality. The model represents the aspects suitable for an intended purpose.

Partial Model This is a part of a model which is intended to be persisted in one particular artifact.

Pattern in GST This is an approach to simplify the definition of the meta model by applying a model transformation. This transformation creates an enhanced model out of an annotated model.

Profile Authoring Support Data Data that is used for efficient authoring of a profile. E.g. list of referable constraints, meta-classes, meta-attributes or other reusable model assets (blueprints)

Profile Authoring Tool A specialized AUTOSAR Tool which focuses on the authoring of profiles for data exchange points. It e.g. provides support for the creation of profiles from scratch, modification of existing profiles or composition of existing profiles.

Profile Compatibility Checker Tool A specialized AUTOSAR Tool which focuses on checking the compatibility of profiles for data exchange. Note that this compatibility check includes manual compatibility checks by engineers and automated assistance using more formal algorithms.

Profile Consistency Checker Tool A specialized AUTOSAR Tool which focuses on checking the consistency of profiles.

Property A property is a structural feature of an object. As an example a “connector” has the properties “receive port” and “send port”

Properties are made variant by the `<<atpVariation>>`.

Prototype This is the implementation of a role of a type within the definition of another type. In other words a type may contain Prototypes that in turn are typed by “Types”. Each one of these prototypes becomes an instance when this type is instantiated.

Type A type provides features that can appear in various roles of this type.

Value This is a particular value assigned to a “Definition”.

Variability Variability of a system is its quality to describe a set of variants. These variants are characterized by variant specific property settings and / or selections. As an example, such a system property selection manifests itself in a particular “receive port” for a connection.

This is implemented using the `<<atpVariation>>`.

Variant A system variant is a concrete realization of a system, so that all its properties have been set respectively selected. The software system has no variability anymore with respect to the binding time.

This is implemented using `EvaluatedVariantSet`.

Variation Binding A variant is the result of a variation binding process that resolves the variability of the system by assigning particular values/selections to all the system’s properties.

This is implemented by `VariationPoint`.

Variation Binding Time The variation binding time determines the step in the methodology at which the variability given by a set of variable properties is resolved.

This is implemented by `vh.LatestBindingtime` at the related properties.

Variation Definition Time The variation definition time determines the step in the methodology at which the variation points are defined.

Variation Point A variation point indicates that a property is subject to variation. Furthermore, it is associated with a condition and a binding time which define the system context for the selection / setting of a concrete variant.

This is implemented by `VariationPoint`.

D Modeling of InstanceRef

D.1 Introduction

The existence of so-called `InstanceRefs` is a direct consequence to the usage of the type-prototype pattern for modeling within AUTOSAR. When referencing a `prototype` it is also necessary to include a reference to the `prototypes` typed by their corresponding `types` that in turn aggregate further `prototypes` to set up the context.

In other words, `InstanceRefs` are representing **structured references** that, on the one hand, consist of references to context `prototypes` (indicated by a subsetting or redefinition of `atpContextElement`) and finally a reference to the applicable target `prototype` (indicated by a redefinition of `atpTarget`).

Note that it is not uncommon to have more than a single context in the modeling of particular `InstanceRefs`.

For the reader of specifications, the modeling of `InstanceRefs` manifests as a UML dependency stereotyped `<<instanceRef>>` drawn from one meta-class to another.

This is a simplified indication that the source of the dependency implements an `InstanceRef` to the meta-class at the target of the dependency. Again, in most cases this is everything a reader needs to understand in order to figure out the modeling.

The formal modeling of `InstanceRefs` is done by creating subclasses of the abstract meta-class `AtpInstanceRef`.

Wherever a more detailed understanding of the modeling is advised in the context of the specific chapter of this document, the modeling of a specific subclasses of `AtpInstanceRef` is explained directly in the context of the corresponding chapter.

In all other cases, a deeper understanding of the modeling of particular subclasses of `AtpInstanceRefs` can be obtained from reading this chapter.

Class tables included in this chapter are not fully filled out in the sense that most of the notes inside the class tables are missing.

The **primary** purpose of these class tables is to **provide information about the intended order** in which `InstanceRefs` are **serialized in M1 AUTOSAR models**.

In particular, the information about the order in serialized M1 models can be obtained from the value of the tag `xml.sequenceOffset` of each attribute of an `InstanceRef` meta-class.

For more information about the general concept of modeling `AtpInstanceRef` (e.g. the conceptual background of redefining or subsetting an association from a subclass of `AtpInstanceRef` to other meta-classes) please refer to [24].

D.2 Modeling

Class	DataPrototypeInSystemInstanceRef			
Package	M2::AUTOSARTemplates::DiagnosticExtract::InstanceRefs			
Note				
Base	ARObject, AtpInstanceRef			
Attribute	Type	Mult.	Kind	Note
base	System	0..1	ref	<p>This represents the base of the InstanceRef</p> <p>Stereotypes: atpDerived</p> <p>Tags:xml.sequenceOffset=10</p>
context Component	SwComponent Prototype	*	ref	Tags: xml.sequenceOffset=30
contextData Prototype (ordered)	ApplicationComposite ElementDataPrototype	*	ref	Tags: xml.sequenceOffset=50
contextPort	PortPrototype	0..1	ref	<p>This represents the PortPrototype that is contained in the InstanceRef.</p> <p>Tags:xml.sequenceOffset=40</p>
contextRoot Composition	RootSwComposition Prototype	0..1	ref	Tags: xml.sequenceOffset=20
targetData Prototype	DataPrototype	0..1	ref	<p>This represents the target of the InstanceRef</p> <p>Tags:xml.sequenceOffset=60</p>

Table D.1: DataPrototypeInSystemInstanceRef

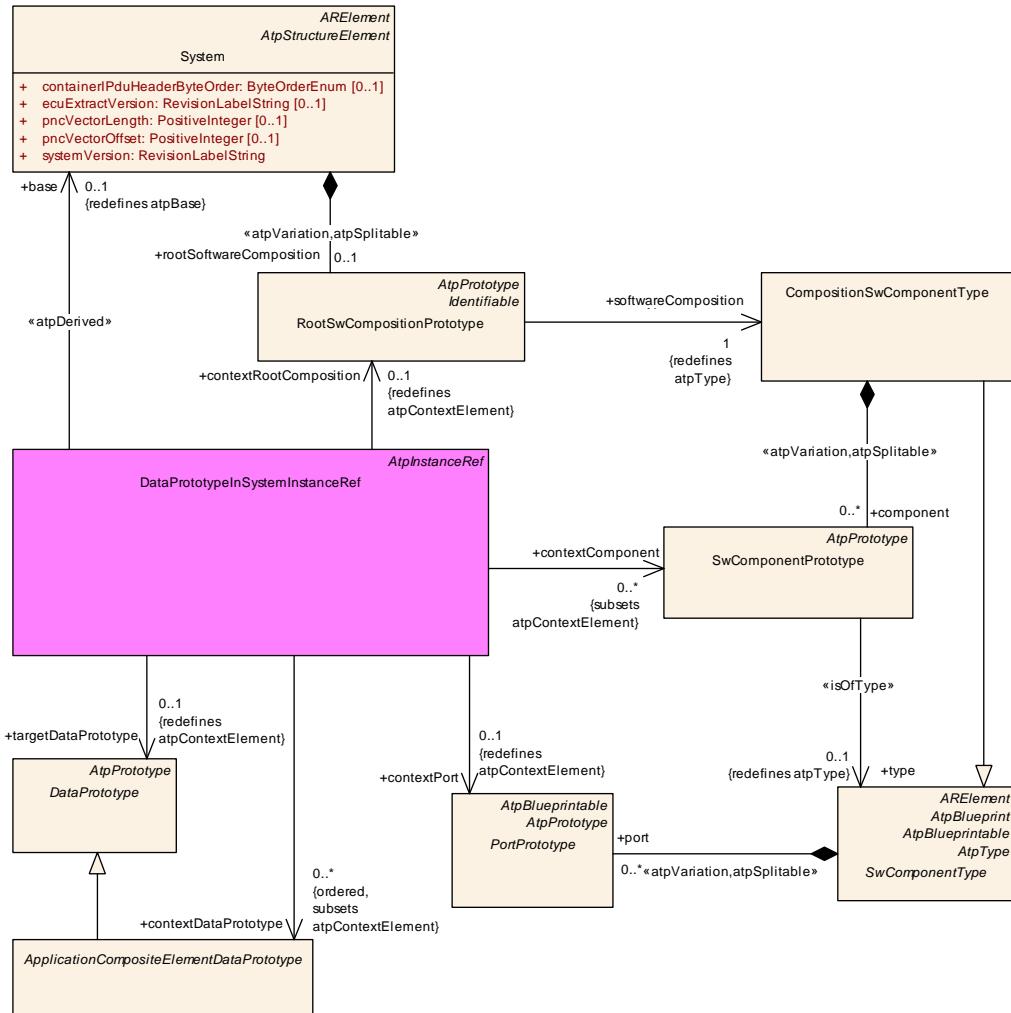


Figure D.1: Modeling of `DataPrototypeInSystemInstanceRef`

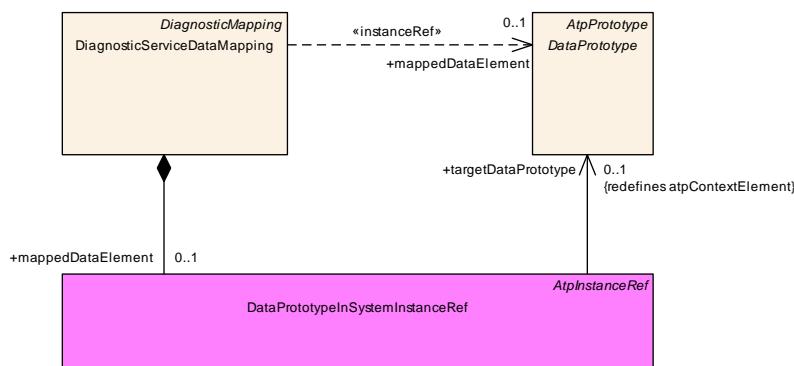
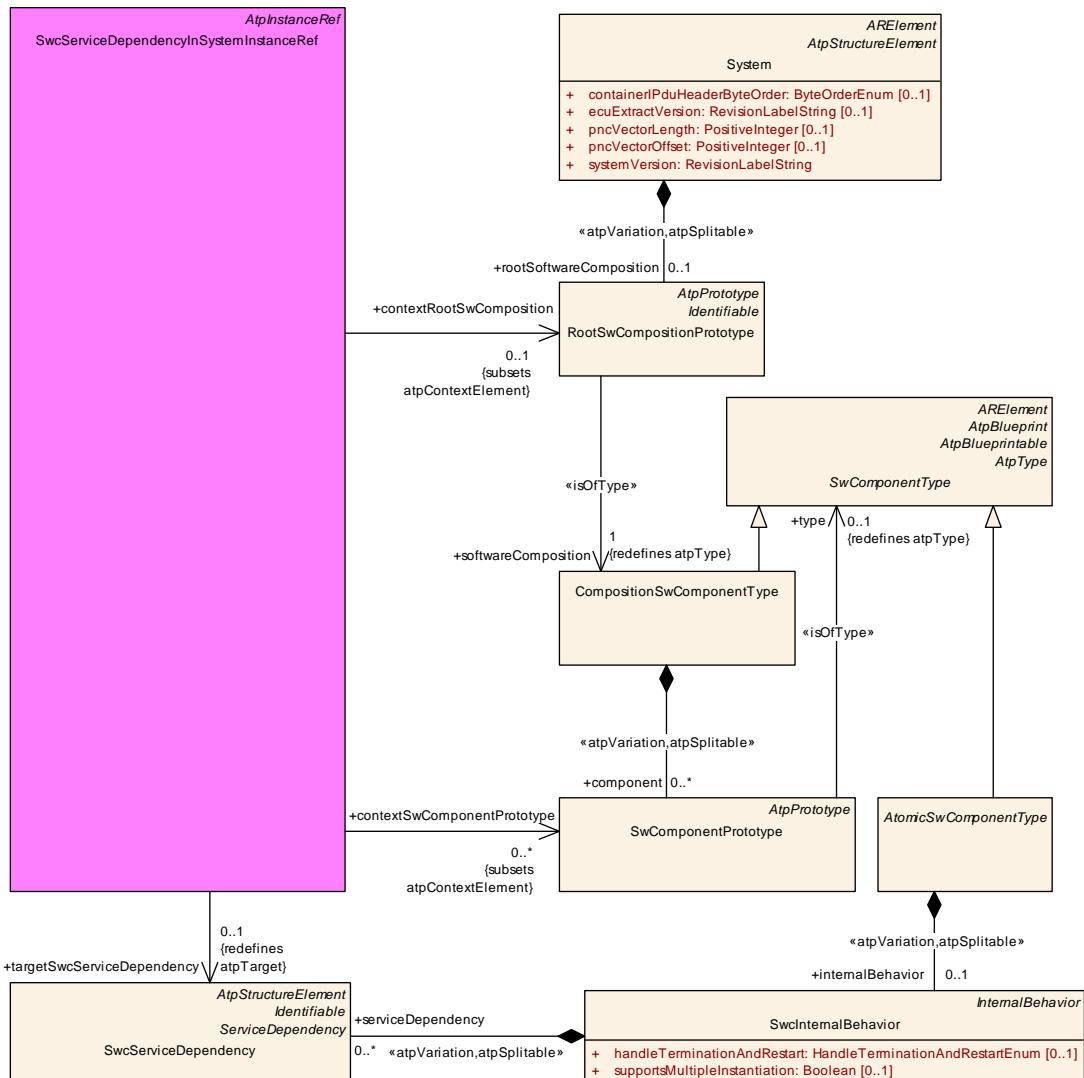


Figure D.2: Modeling of `DiagnosticServiceDataMapping`

Class	SwcServiceDependencyInSystemInstanceRef			
Package	M2::AUTOSARTemplates::DiagnosticExtract::InstanceRefs			
Note				
Base	<i>ARObject, AtpInstanceRef</i>			
Attribute	Type	Mult.	Kind	Note
contextRootSwComposition	RootSwComposition Prototype	0..1	ref	
contextSwComponentPrototype	SwComponent Prototype	*	ref	
targetSwcServiceDependency	SwcService Dependency	0..1	ref	

Table D.2: SwcServiceDependencyInSystemInstanceRef

Figure D.3: Modeling of SwcServiceDependencyInSystemInstanceRef

Class	PModelInSystemInstanceRef			
Package	M2::AUTOSARTemplates::DiagnosticExtract::InstanceRefs			
Note				
Base	ARObject, AtlInstanceRef			
Attribute	Type	Mult.	Kind	Note
base	System	0..1	ref	Stereotypes: atpDerived Tags: xml.sequenceOffset=10
context Component	SwComponent Prototype	*	ref	Tags: xml.sequenceOffset=30
context Composition	RootSwComposition Prototype	0..1	ref	Tags: xml.sequenceOffset=20
contextMode Declaration Group	ModeDeclarationGroup Prototype	0..1	ref	Tags: xml.sequenceOffset=50
contextPPort	AbstractProvidedPort Prototype	0..1	ref	Tags: xml.sequenceOffset=40
targetMode	ModeDeclaration	0..1	ref	Tags: xml.sequenceOffset=60

Table D.3: PModelInSystemInstanceRef

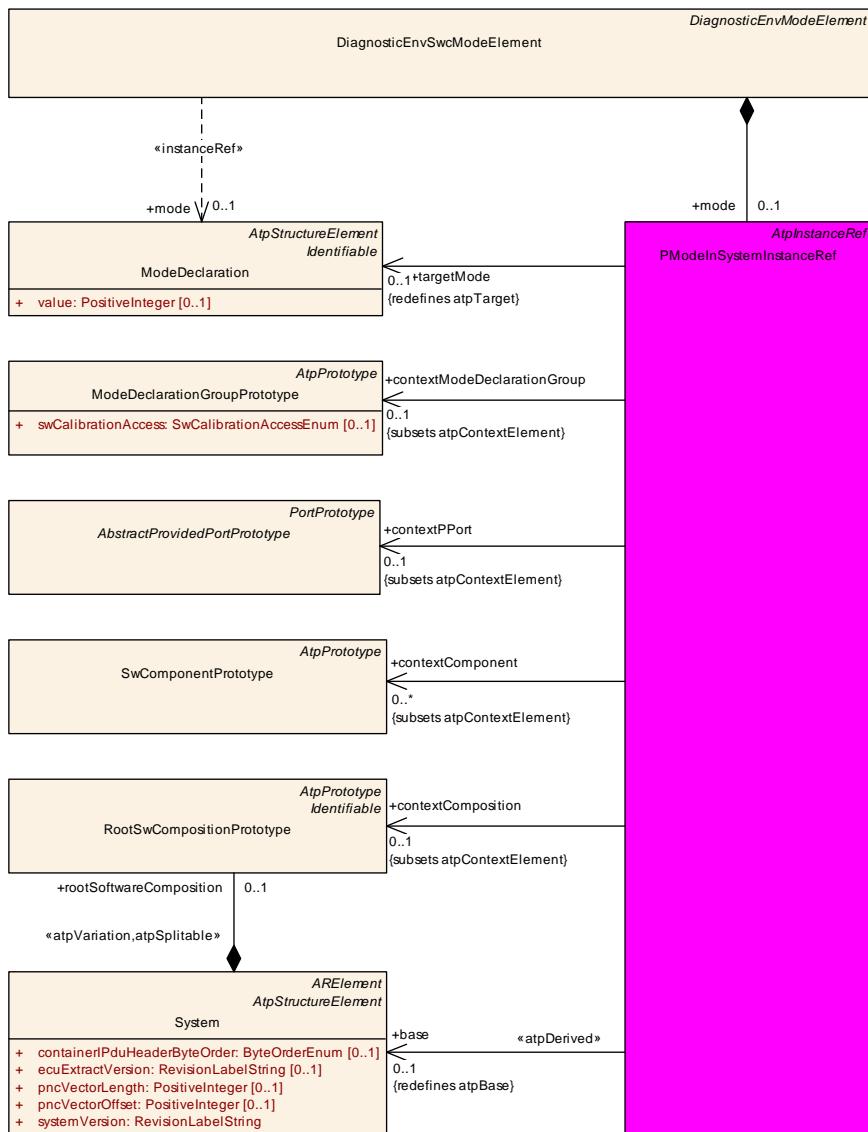


Figure D.4: Formal modeling of the comparison of a [ModeDeclarationGroupPrototype](#) with a [ModeDeclaration](#)

E Upstream Mapping

E.1 Introduction

This chapter describes the mapping of the ECU Configuration parameters (M1 model) onto the meta-classes and attributes of the AUTOSAR upstream templates (System Template, SW Component Template and ECU Resource Template).

The relationships between upstream templates and ECU Configuration are described in order to answer typical questions like:

- How shall a supplier use the information in a System Description in order to fulfill the needs defined by the systems engineer?
- How is a tool vendor supposed to generate an ECU Configuration Description out of ECU Extract of System Description?

Please note that the tables contain the following columns:

bsw module: Name of BSW module

bsw context: Reference to parameter container

bsw type: Type of parameter

bsw param: Name of the BSW parameter

bsw desc: Description from the configuration document

m2 template: System Template, SW Component Template, ECU Resource Template

m2 param: Name of the upstream template parameter

m2 description: Description from the upstream template definition

mapping rule: Textual description on how to transform between M2 and BSW domains

mapping type:

- local: no mapping needed since parameter local to BSW
- partial: some data can be automatically mapped but not all
- full: all data can be automatically mapped

E.2 Dcm

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsd	
BSW Parameter	BSW Type	
DcmDsdServiceTable	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description	<p>This container contains the configuration (DSD parameters) for a Service Identifier Table.</p> <p>Note: It is allowed to add OBD services to a DcmDsdServiceTable related to a UDS Protocol. But it is not allowed to add UDS services to a DcmDsdServiceTable related to an OBD Protocol.</p>	
Template Description	<p>This meta-class represents a model of a diagnostic service table, i.e. the UDS services applicable for a given ECU.</p>	
M2 Parameter	<p>DiagnosticExtract::DiagnosticContribution::DiagnosticServiceTable</p>	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00732]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService	
BSW Parameter	BSW Type	
DcmDsdSidTabSecurityLevelRef	ECUC-REFERENCE-DEF	
BSW Description	<p>Reference to a Security Level in which the service is allowed to be executed. Multiple references are allowed for a service.</p> <p>Please refer to ISO 14229-1, ISO 15031-5 and chapter "Verification of the Service Security Access levels."</p> <p>If there is no reference configured, no service security verification shall be performed.</p>	
Template Description	<p>This represents the associated DiagnosticSecurityLevels</p>	
M2 Parameter	<p>DiagnosticExtract::Dcm::DiagnosticAccessPermission.securityLevel</p>	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00733]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService	
BSW Parameter	BSW Type	
DcmDsdSidTabServiceId	ECUC-INTEGER-PARAM-DEF	
BSW Description	<p>Identifier of the service.</p> <p>The possible service identifiers are defined in ISO 14229-1 and ISO 15031-5.</p>	
Template Description	<p>This meta-class provides the ability to define common properties that are shared among all instances of sub-classes of DiagnosticServiceInstance.</p>	





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommonService:: DiagnosticServiceClass	
Mapping Rule	Mapping Type
Service identifiers of the used DiagnosticServiceClass	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00735]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService
BSW Parameter	BSW Type
DcmDsdSidTabSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Session Level in which the service is allowed to be executed. Multiple references are allowed for a service. Please refer to ISO 14229-1, ISO 15031-5 and chapter "Verification of the Diagnostic Session". If there is no reference configured, no diagnostic session verification shall be performed.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00734]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService
BSW Parameter	BSW Type
DcmDsdSidTabSubfuncAvail	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Information about whether the service has subfunctions or not. This parameter is used for the handling of the "suppressPosRspMsgIndicationBit" as defined in ISO 14229-1, which can be used as a reference for the configuration. true - service has subfunctions, suppressPosRspMsgIndicationBit is available false - service has no subfunctions, suppressPosRspMsgIndicationBit is not available	
Template Description	
The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.	
M2 Parameter	
GenericStructure::GeneralTemplateClasses::Identifiable::Identifiable. category	
Mapping Rule	Mapping Type
Standardized sub-functions of diagnostic services are mainly identified by the category. There are further specific attributes in the meta-model that allow for handling custom subfunctions,	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00737]

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService/DcmDsdSubService			
BSW Parameter	BSW Type			
DcmDsdSubServiceFnc	ECUC-FUNCTION-NAME-DEF			
BSW Description				
Callback function of the ECU Supplier specific component for the particular service. The function's prototype is as described for <Module>_<DiagnosticService>_<SubService>.				
If this parameter is not configured, the subservice is handled Dcm-internally.				
Template Description				
This attribute shall be used to define a custom sub-function number if none of the standardized values of category shall be used.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControl. customSubFunctionNumber				
Mapping Rule	Mapping Type			
The existence of a custom subfunction number shall trigger the creation of a custom processor.		full		
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00942]			

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService/DcmDsdSubService			
BSW Parameter	BSW Type			
DcmDsdSubServiceId	ECUC-INTEGER-PARAM-DEF			
BSW Description				
Identifier of the subservice.				
The possible subservice identifiers are defined in ISO 14229-1 and ISO 15031-5.				
Template Description				
The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.				
M2 Parameter				
GenericStructure::GeneralTemplateClasses::Identifiable::Identifiable. category				
Mapping Rule	Mapping Type			
Numerical values of diagnostic service according to ISO 14229 correspond to values of DiagnosticServiceInstance.category.		partial		
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00803]			

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService/DcmDsdSubService			
BSW Parameter	BSW Type			
DcmDsdSubServiceSecurityLevelRef	ECUC-REFERENCE-DEF			
BSW Description				
Reference to a Security Level in which the subservice is allowed to be executed. Multiple references are allowed for a subservice.				
Please refer to ISO 14229-1, ISO 15031-5 and chapter "Verification of the Service Security Access levels."				
If there is no reference configured, no subservice security verification shall be performed.				
Template Description				





This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00812]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsd/DcmDsdServiceTable/DcmDsdService/DcmDsdSubService
BSW Parameter	BSW Type
DcmDsdSubServiceSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Session Level in which the subservice is allowed to be executed. Multiple references are allowed for a subservice.	
Please refer to ISO 14229-1, ISO 15031-5 and chapter "Verification of the Diagnostic Session".	
If there is no reference configured, no diagnostic session verification shall be performed.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00804]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslDiagResp
BSW Parameter	BSW Type
DcmDslDiagRespMaxNumRespPend	ECUC-INTEGER-PARAM-DEF
BSW Description	
Maximum number of negative responses with response code 0x78 (requestCorrectlyReceivedResponsePending) allowed for a request. If Dcm reaches this limit, an automatic 0x10 (generalReject) final response will be transmitted and the service processing will be cancelled. Value 0x00 means that no NRC 0x78 response will be transmitted.	
Template Description	
Maximum number of negative responses with response code 0x78 (requestCorrectlyReceived-ResponsePending) allowed per request. DCM will send a negative response with response code 0x10 (generalReject), in case the limit value gets reached. Value 0xFF means that no limit number of NRC 0x78 response apply.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. maxNumberOfRequestCorrectlyReceivedResponsePending	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00693]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslDiagResp	
BSW Parameter	BSW Type	
DcmDslDiagRespOnSecondDeclinedRequest	ECUC-BOOLEAN-PARAM-DEF	
BSW Description		
Defines the reaction upon a second request (ClientB) that can not be processed (e.g. due to priority assessment). TRUE: when the second request (Client B) can not be processed, it shall be answered with NRC21 BusyRepeatRequest. FALSE: when the second request (Client B) can not be processed, it shall not be responded.		
Template Description		
Defines the reaction upon a second request (ClientB) that can not be processed (e.g. due to priority assessment). TRUE: when the second request (Client B) can not be processed, it shall be answered with NRC21 BusyRepeatRequest. FALSE: when the second request (Client B) can not be processed, it shall not be responded.		
M2 Parameter		
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. responseOnSecondDeclinedRequest		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00914]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol	
BSW Parameter	BSW Type	
DcmDslProtocolRow	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description		
This container contains the configuration of one particular diagnostic protocol used in Dcm.		
Template Description		
This meta-class represents the ability to define a diagnostic protocol.		
M2 Parameter		
DiagnosticExtract::DiagnosticContribution:: DiagnosticProtocol		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00695]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection	
BSW Parameter	BSW Type	
DcmDslProtocolComMChannelRef	ECUC-REFERENCE-DEF	
BSW Description		
Reference to the ComMChannel on which the DcmDslProtocolRxPdu is received and the DcmDslProtocolTxPdu is transmitted.		
Template Description		





The CommunicationCluster is the main element to describe the topological connection of communicating ECUs.

A cluster describes the ensemble of ECUs, which are linked by a communication medium of arbitrary topology (bus, star, ring, ...). The nodes within the cluster share the same communication protocol, which may be event-triggered, time-triggered or a combination of both.

A CommunicationCluster aggregates one or more physical channels.

M2 Parameter

SystemTemplate::Fibex::FibexCore::CoreTopology::CommunicationCluster

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00952]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection/DcmDslProtocolRx/DcmDslProtocolRxAddrType

BSW Parameter

DCM_FUNCTIONAL_TYPE ECUC-ENUMERATION-LITERAL-DEF

BSW Description

FUNCTIONAL = 1 to n communication

Template Description

Reference to functional request messages.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.functionalRequest

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection/DcmDslProtocolRx/DcmDslProtocolRxAddrType

BSW Parameter

DCM_PHYSICAL_TYPE ECUC-ENUMERATION-LITERAL-DEF

BSW Description

PHYSICAL = 1 to 1 communications using physical addressing

Template Description

Reference to a physical request message.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.physicalRequest

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection/DcmDslProtocolRx
BSW Parameter	BSW Type
DcmDslProtocolRxPduRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Pdu in EcuC that is used for this reception channel.	
Template Description	
The IPdu (Interaction Layer Protocol Data Unit) element is used to sum up all Pdus that are routed by the PduR.	
M2 Parameter	
SystemTemplate::Fibex::FibexCore::CoreCommunication::IPdu	
Mapping Rule	Mapping Type
Reference to IPdu of xxxTpConnection for DiagnosticConnection.physicalRequest / DiagnosticConnection.functionalRequest	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00770]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection
BSW Parameter	BSW Type
DcmDslProtocolTx	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration parameters of a transmission channel in a diagnostic connection.	
The PDU referenced by this transmission channel can produce meta data items of type TARGET_ADDRESS_16 and SOURCE_ADDRESS_16.	
Template Description	
In the vast majority of cases a response is required. However, there are also cases where providing the response is not possible and/or not allowed.	
M2 Parameter	
SystemTemplate::DiagnosticConnection::DiagnosticConnection.response	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00711]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslMainConnection/DcmDslProtocolTx
BSW Parameter	BSW Type
DcmDslProtocolTxPduRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Pdu in EcuC that is used for this transmission channel.	
Template Description	
The IPdu (Interaction Layer Protocol Data Unit) element is used to sum up all Pdus that are routed by the PduR.	
M2 Parameter	
SystemTemplate::Fibex::FibexCore::CoreCommunication::IPdu	





Mapping Rule		Mapping Type
Reference to IPdu of xxxTpConnection for DiagnosticConnection.response		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00772]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslPeriodicTransmission/DcmDslPeriodicConnection
BSW Parameter	BSW Type
DcmDslPeriodicTxPduRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Pdu in EcuC that is used for this periodic transmission channel.	
Template Description	
The IPdu (Interaction Layer Protocol Data Unit) element is used to sum up all Pdus that are routed by the PduR.	
M2 Parameter	
SystemTemplate::Fibex::FibexCore::CoreCommunication::IPdu	
Mapping Rule	Mapping Type
Reference to IPdu of xxxTpConnection in case of DiagnosticConnection.periodicResponseTp or IPdu of PduTriggering in case of DiagnosticConnection.periodicResponseUudt	
Mapping Status	ECUC Parameter ID
valid	
[ECUC_Dcm_00742]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslConnection/DcmDslResponseOnEvent
BSW Parameter	BSW Type
DcmDslRoeTxPduRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Pdu in EcuC that is used for this ResponseOnEvent transmission connection.	
Template Description	
The IPdu (Interaction Layer Protocol Data Unit) element is used to sum up all Pdus that are routed by the PduR.	
M2 Parameter	
SystemTemplate::Fibex::FibexCore::CoreCommunication::IPdu	
Mapping Rule	Mapping Type
Reference to IPdu of xxxTpConnection for DiagnosticConnection.responseOnEvent	
Mapping Status	ECUC Parameter ID
valid	
[ECUC_Dcm_00743]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow
BSW Parameter	BSW Type
DcmDslProtocolPriority	ECUC-INTEGER-PARAM-DEF
BSW Description	





Protocol priority used during protocol preemption. A higher priority protocol may preempt a lower priority protocol. Lower numeric values represent higher protocol priority:

- 0 - Highest protocol priority
 - 255 - Lowest protocol priority
- | Template Description | |
|---|--|
| This represents the priority of the diagnostic protocol in comparison to other diagnostic protocols. Lower numeric values represent higher protocol priority: | |
| <ul style="list-style-type: none"> • 0 - Highest protocol priority • 255 - Lowest protocol priority | |

M2 Parameter

DiagnosticExtract::DiagnosticContribution::DiagnosticProtocol.[priority](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00699]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolTransType
BSW Parameter	BSW Type
TYPE1	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Messages on the DcmTxPduld already used for normal diagnostic responses. The outgoing messages must be synchronized with 'normal outgoing messages', which have a higher priority.

Template Description

Reference to a ROE message.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.[responseOnEvent](#)

Mapping Rule	Mapping Type
TYPE1 : periodicResponseTp / responseOnEvent using same reference as the normal response	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolTransType
BSW Parameter	BSW Type
TYPE2	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Messages on a separate DcmTxPduld.

Template Description

Reference to a ROE message.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.[responseOnEvent](#)

Mapping Rule	Mapping Type
TYPE2: periodicResponseTp / responseOnEvent using other reference as the normal response	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_PERIODICTRANS_ON_CAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
AbstractCanPhysicalChannel: Abstract class that is used to collect the common TtCAN and CAN PhysicalChannel attributes.	
DiagnosticConnection.periodicResponseUudt: Reference to UUDT responses.	
M2 Parameter	
SystemTemplate::Fibex::Fibex4Can::CanTopology::AbstractCanPhysicalChannel, SystemTemplate::DiagnosticConnection::DiagnosticConnection.periodicResponseUudt	
Mapping Rule	Mapping Type
If DiagnosticConnection.periodicResponseUudt exists and PhysicalChannel given as AbstractCanPhysicalChannel.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_PERIODICTRANS_ON_IP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
StaticSocketConnection: Definition of static SocketConnection between the Socket that is defined by the aggregating SocketAddress and the remote Address.	
DiagnosticConnection.periodicResponseUudt: Reference to UUDT responses.	
EthernetPhysicalChannel: The EthernetPhysicalChannel represents a VLAN or an untagged channel. An untagged channel is modeled as an EthernetPhysicalChannel without an aggregated VLAN.	
M2 Parameter	
SystemTemplate::Fibex::Fibex4Ethernet::ServiceInstances::StaticSocketConnection, SystemTemplate::DiagnosticConnection::DiagnosticConnection.periodicResponseUudt, SystemTemplate::Fibex::Fibex4Ethernet::EthernetTopology::EthernetPhysicalChannel	
Mapping Rule	Mapping Type
If DiagnosticConnection.periodicResponseUudt exists and PhysicalChannel given as EthernetPhysicalChannel.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_ROE_ON_CAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticConnection.responseOnEvent:	
Reference to a ROE message.	
CanTpConnection:	
A connection identifies the sender and the receiver of this particular communication. The CanTp module routes a Pdu through this connection.	
atpVariation: Derived, because TpNode can vary.	
M2 Parameter	
SystemTemplate::DiagnosticConnection::DiagnosticConnection. responseOnEvent , SystemTemplate::TransportProtocols::CanTpConnection	
Mapping Rule	Mapping Type
In case DiagnosticConnection.responseOnEvent exists and TpConnectionIdent.ident belongs to a CanTpConnection.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_ROE_ON_FLEXRAY	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticConnection.responseOnEvent:	
Reference to a ROE message.	
FlexrayTpConnection:	
A connection identifies the sender and the receiver of this particular communication. The FlexRayTp module routes a Pdu through this connection.	
In a System Description the references to the PduPools are mandatory. In an ECU Extract these references can be optional: On unicast connections these references are always mandatory. On multicast the txPduPool is mandatory on the sender side. The rxPduPool is mandatory on the receiver side. On Gateway ECUs both references are mandatory.	
M2 Parameter	
SystemTemplate::DiagnosticConnection::DiagnosticConnection. responseOnEvent , SystemTemplate::TransportProtocols::FlexrayTpConnection	
Mapping Rule	Mapping Type
In case DiagnosticConnection.responseOnEvent exists and TpConnectionIdent.ident belongs to FlexRayTpConnection	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type





DCM_ROE_ON_IP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticConnection.responseOnEvent: Reference to a ROE message.	
StaticSocketConnection: Definition of static SocketConnection between the Socket that is defined by the aggregating SocketAddress and the remote Address.	
M2 Parameter	
SystemTemplate::DiagnosticConnection::DiagnosticConnection. responseOnEvent , SystemTemplate::Fibex::Fibex4Ethernet::ServiceInstances::StaticSocketConnection	
Mapping Rule	
In case DiagnosticConnection.responseOnEvent exists and TpConnectionIdent.ident belongs to SocketConnection	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_UDS_ON_CAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
UDS on CAN (ISO15765-3; ISO14229-1)	
Template Description	
DiagnosticConnection.physicalRequest: Reference to a physical request message.	
CanTpConnection: A connection identifies the sender and the receiver of this particular communication. The CanTp module routes a Pdu through this connection. atpVariation: Derived, because TpNode can vary.	
M2 Parameter	
SystemTemplate::DiagnosticConnection::DiagnosticConnection. physicalRequest , SystemTemplate::TransportProtocols::CanTpConnection	
Mapping Rule	
In case DiagnosticConnection.physicalRequest exists and TpConnectionIdent.ident belongs to CanTpConnection	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_UDS_ON_FLEXRAY	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
UDS on FlexRay (Manufacturer specific; ISO14229-1)	
Template Description	




DiagnosticConnection.physicalRequest:

Reference to a physical request message.

FlexrayTpConnection:

A connection identifies the sender and the receiver of this particular communication. The FlexRayTp module routes a Pdu through this connection.

In a System Description the references to the PduPools are mandatory. In an ECU Extract these references can be optional: On unicast connections these references are always mandatory. On multicast the txPduPool is mandatory on the sender side. The rxPduPool is mandatory on the receiver side. On Gateway ECUs both references are mandatory.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.physicalRequest, SystemTemplate::TransportProtocols::FlexrayTpConnection

Mapping Rule	Mapping Type
In case DiagnosticConnection.physicalRequest exists and TpConnectionIdent.ident belongs to FlexRayTpConnection	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsl/DcmDslProtocol/DcmDslProtocolRow/DcmDslProtocolType
BSW Parameter	BSW Type
DCM_UDS_ON_IP	ECUC-ENUMERATION-LITERAL-DEF

BSW Description
Template Description
DiagnosticConnection.physicalRequest:

Reference to a physical request message.

StaticSocketConnection:

Definition of static SocketConnection between the Socket that is defined by the aggregating SocketAddress and the remote Address.

M2 Parameter

SystemTemplate::DiagnosticConnection::DiagnosticConnection.physicalRequest, SystemTemplate::Fibex::Fibex4Ethernet::ServiceInstances::StaticSocketConnection

Mapping Rule	Mapping Type
In case DiagnosticConnection.physicalRequest exists and TpConnectionIdent.ident belongs to a SocketConnection	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl/DcmDspComControlAllChannel
BSW Parameter	BSW Type
DcmDspAllComMChannelRef	ECUC-REFERENCE-DEF

BSW Description

Reference to ComM channel.

Template Description

This reference represents the semantics that all available channels shall be affected. It is still necessary to refer to individual CommunicatuionClusters because there could be private CommunicationClusters in the System Extract that are not subject to the service "communication control".

By referring to the applicable CommunicationClusters it can be made sure that only the affected CommunicationClusters are accessed.





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlClass. allChannels	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00902]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl/DcmDspComControlSpecificChannel
BSW Parameter	BSW Type
DcmDspSpecificComMchannelRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to ComM channel.	
Template Description	
This represents the ability to add additional attributes to the case that only specific channels are supposed to be considered,	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlClass. specificChannel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00904]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl/DcmDspComControlSpecificChannel
BSW Parameter	BSW Type
DcmDspSubnetNumber	ECUC-INTEGER-PARAM-DEF
BSW Description	
Subnet Number which controls the specific ComMChannel.	
Template Description	
This represents the applicable subnet number (which is an arbitrary number ranging from 1..14)	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlSpecificChannel. subnetNumber	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00905]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl
BSW Parameter	BSW Type
DcmDspComControlSubNode	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container gives information about the node identification number and the ComM channel used to address a sub-network.	
Template Description	





This attribute represents the ability to add further attributes to the definition of a specific sub-node channel that is subject to the diagnostic service "communication control".

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlClass.[subNodeChannel](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01033]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl/DcmDspComControlSubNode
BSW Parameter	BSW Type
DcmDspComControlSubNodeComMChannelRef	ECUC-REFERENCE-DEF
BSW Description	
This parameter references a ComM channel where this node is connected to.	
Template Description	
This represents the affected CommunicationClusters in the role subNodeChannel	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlSubNodeChannel. subNodeChannel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01030]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspComControl/DcmDspComControlSubNode
BSW Parameter	BSW Type
DcmDspComControlSubNodeld	ECUC-INTEGER-PARAM-DEF
BSW Description	
The node identification number DcmDspComControlSubNodeld is addressed by the CommunicationControl (0x28) request.	
Template Description	
This represents the applicable subNode number. The value corresponds to the request message parameter node IdentificationNumber of diagnostic service CommunicationControl (0x28).	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::CommunicationControl::DiagnosticComControlSubNodeChannel. subNodeNumber	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01031]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type





DcmDspCommonAuthorization	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for the common Authorization being equal for several services / sub-services.	
Template Description	
This represents an instance of the "Routine Control" diagnostic service.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::RoutineControl::DiagnosticRoutineControl	
Mapping Rule	Mapping Type
1:1 mapping	
Mapping Status	ECUC Parameter ID
valid	
[ECUC_Dcm_01025]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspControlDTCSetting
BSW Parameter	BSW Type
DcmSupportDTCSettingControlOptionRecord	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
This configuration switch defines if the DTCSettingControlOptionRecord is in general supported in the request message or not.	
Template Description	
This represents the decision whether the DTCSettingControlOptionRecord (see ISO 14229-1) is in general supported in the request message.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ControlDTCSetting::DiagnosticControlDTCSettingClass. controlOptionRecordPresent	
Mapping Rule	Mapping Type
1:1 mapping	
Mapping Status	ECUC Parameter ID
valid	
[ECUC_Dcm_00965]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspDDIDcheckPerSourceDID	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Defines the check for session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22). true: Dcm module shall check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF false: Dcm module shall not check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF.	
Template Description	
If set to TRUE, the Dcm module shall check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF. If set to FALSE, the Dcm module shall not check the session, security and mode dependencies per source DIDs with a ReadDataByIdentifier (0x22) with DID in the range 0xF200 to 0xF3FF.	





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier::DiagnosticDynamicallyDefineDataIdentifier Class. checkPerSourceId	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00966]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspData	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) of a Data belonging to a DID	
Template Description	
DiagnosticSecurityEventReportingModeMapping: This meta-class represents the ability to associate a location in a DID with a security event. The purpose of this mapping is that the location in the DID contains the setting of the reporting mode for the specific security event. This means that the reporting mode of the security event can be set via the diagnostic service WriteDataByIdentifier.	
DiagnosticSecurityEventReportingModeMapping.securityEvent: This reference identifies the mapped security event.	
DiagnosticSecurityEventReportingModeMapping.dataElement: This reference identifies the data element that carries the information about the reporting mode.	
M2 Parameter	
DiagnosticExtract::ServiceMapping:: DiagnosticSecurityEventReportingModeMapping , DiagnosticExtract::Service Mapping::DiagnosticSecurityEventReportingModeMapping. securityEvent , DiagnosticExtract::Service Mapping::DiagnosticSecurityEventReportingModeMapping. dataElement	
Mapping Rule	Mapping Type
If a DiagnosticSecurityEventReportingModeMapping exists then: * DcmDspDataType shall be set to UINT8_N * DcmDspDataByteSize shall be set to the number of bytes in the DiagnosticData Identifier * DcmDspDataUsePort shall be set to USE_DATA_SYNCH_FNC * DcmDspDataReadFnc shall be set to the name of the read API for reporting mode at the IdSM * DcmDspDataWriteFnc shall be set to the name of the write API for reporting mode at the IdSM	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00869]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataByteSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the array length in bytes or the maximum array length for variable datalengths.	
Template Description	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	





DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#)

Mapping Rule	Mapping Type
S/R via array: DcmDspDataByteSize= maxNumberOfElements * (baseTypeSize / 8) C/S of FNC callback: DcmDspDataByteSize= maxNumberOfElements Note: 8 is the baseTypeSize of UINT8	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01106]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataConditionCheckReadFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to demand application if the conditions (e.g. System state) to read the DID are correct. (ConditionCheck Read-function).	
Multiplicity shall be equal to parameter DcmDspDataReadFnc. This parameter is related to the interface Xxx_ConditionCheck Read.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00677]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the endianness of the data belonging to a DID in a diagnostic request or response message.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. byteOrder	
Mapping Rule	Mapping Type
baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticDataIdentifier.dataElement	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00986]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type





DcmDspDataFreezeCurrentStateFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request to application to freeze the current state of an IOControl. (FreezeCurrentState-function). This parameter is related to the interface Xxx_FreezeCurrentState.	
Template Description	
DiagnosticServiceSwMapping.mappedBswServiceDependency: This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
DiagnosticIocControlNeeds.freezeCurrentStateSupported: This attribute determines, if the referenced port supports temporary freezing of I/O value.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency, Common Structure::ServiceNeeds::DiagnosticIocControlNeeds.freezeCurrentStateSupported	
Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00674]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	
DcmDspDataReadDataLengthFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request from application the data length of a DID. (ReadDataLength-function). This parameter is related to the interface Xxx_ReadDataLength.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency	
Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00671]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	
DcmDspDataReadFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request from application the data value of a DID. (ReadData-function). This parameter is related to the interface Xxx_ReadData.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	





DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency

Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00669]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataResetToDefaultFnc	ECUC-FUNCTION-NAME-DEF

BSW Description

Function name to request to application to reset an IOControl to default value. (ResetToDefault-function). This parameter is related to the interface Xxx_ResetToDefault.

Template Description

DiagnosticServiceSwMapping.mappedBswServiceDependency:

This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.

DiagnosticIcControlNeeds.resetToDefaultSupported:

This represents a flag for the existence of the ResetToDefault operation in the service interface.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency, Common Structure::ServiceNeeds::DiagnosticIcControlNeeds.resetToDefaultSupported

Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00673]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataReturnControlToEcuFnc	ECUC-FUNCTION-NAME-DEF

BSW Description

Function name to request to application to return control to ECU of an IOControl. (ReturnControlToECU-function). This parameter is related to the interface Xxx_ReturnControlToECU.

Template Description

This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency

Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00672]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData	
BSW Parameter	BSW Type	
DcmDspDataShortTermAdjustmentFnc	ECUC-FUNCTION-NAME-DEF	
BSW Description	<p>Function name to request to application to adjust the IO signal. (ShortTermAdjustment-function).</p> <p>This parameter is related to the interface Xxx_ShortTermAdjustment.</p>	
Template Description	<p>DiagnosticServiceSwMapping.mappedBswServiceDependency: This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.</p> <p>DiagnosticIoControlNeeds.shortTermAdjustmentSupported: This attribute determines, if the referenced port supports temporarily setting of I/O value to a specific value provided by the diagnostic tester.</p>	
M2 Parameter	<p>DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency, Common Structure::ServiceNeeds::DiagnosticIoControlNeeds.shortTermAdjustmentSupported</p>	
Mapping Rule	Mapping Type	
It could be possible to get the FNC name via BswServiceDependency	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00675]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType	
BSW Parameter	BSW Type	
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	<p>Type of the data is boolean.</p>	
Template Description	<p>BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.</p> <p>BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.</p> <p>DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.</p>	
M2 Parameter	<p>AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.fixedLength</p>	
Mapping Rule	Mapping Type	
baseTypeEncoding = BOOLEAN baseTypeSize = 1 maxNumberOfElements shall not exist array SizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type





FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the data is sint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements shall not exist arraySize Semantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Type of the data is sint32.
Template Description	BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.
Template Description	BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.
Template Description	DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements shall not exist arraySize Semantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Type of the data is sint32 array.
Template Description	BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.
Template Description	BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.
Template Description	DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.
Template Description	DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.
Template Description	DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements shall not exist arraySize Semantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type





baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	





AsamHdo::BaseTypes::BaseTypeDirectDefinition.**baseTypeEncoding**, AsamHdo::BaseTypes::BaseTypeDirectDefinition.**baseTypeSize**, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.**arraySizeSemantics**, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.**maxNumberOfElements**, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.**fixedLength**

Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	




DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[arraySizeSemantics](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule

baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type

BSW Description

Type of the data is uint8.

Template Description
BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule
Mapping Type

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type

BSW Description

Type of the data is uint8 array with dynamic length.

Template Description



BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticDataElement.arraySizeSemantics:

This attribute controls the meaning of the value of the array size.

DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[arraySizeSemantics](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySizeSemantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002) Derivation from DiagnosticValueNeeds.fixedLength=0 possible.

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Type of the data is uint8 array.
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding:	
This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize:	
Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics:	
This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements:	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticValueNeeds.fixedLength:	
This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001) Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataUsePort	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines which interface shall be used to access the data.	
Template Description	
This attribute controls whether interaction requires the software-component to react synchronously on a request or whether it processes the request in background but still the DCM has to issue the call again to eventually obtain the result of the request.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagnosticValueNeeds. processingStyle	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00713]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort
BSW Parameter	BSW Type
USE_DATA_ASYNCH_CLIENT_SERVER	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The DCM will access the Data using an R-Port requiring a asynchronous ClientServerInterface DataServices_{Data}. The R-Port is named DataServices_{Data} where {Data} is the name of the container DcmDspData.	
Template Description	
The software-component processes the request in background but still the Dcm has to issue the call again to eventually obtain the result of the request.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagnosticProcessingStyleEnum. processingStyleAsynchronous	
Mapping Rule	Mapping Type
DiagnosticServiceSwMapping is having a SwcServiceDependency and ServiceNeeds::Diagnostic ProcessingStyleEnum is equal to processingStyleAsynchronous	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort
BSW Parameter	BSW Type
USE_DATA_ASYNCH_CLIENT_SERVER_ERROR	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The Dcm will access the Data using an R-Port requiring a asynchronous ClientServerInterface DataServices_{Data}. The parameter ErrorCode can be returned to allow the application to trigger a negative response during the operation. The R-Port is named DataServices_{Data} where {Data} is the name of the container DcmDspData.	
Template Description	





The software-component processes the request in background but still the Dcm has to issue the call again to eventually obtain the result of the request or handle error code.

M2 Parameter

CommonStructure::ServiceNeeds::DiagnosticProcessingStyleEnum.processingStyleAsynchronousWithError

Mapping Rule	Mapping Type
DiagnosticServiceSwMapping is having a SwcServiceDependency and ServiceNeeds::Diagnostic ProcessingStyleEnum is equal to processingStyleAsynchronousWithError	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort
BSW Parameter	BSW Type
USE_DATA_ASYNCH_FNC	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

The DCM will access the Data using the functions that are defined in parameters of type EcucFunctionNameDef (but without DcmDspDataReadDataLengthFnc) in the DcmDspData container. DCM_E_PENDING return is allowed. OpStatus is existing as IN parameter.

Template Description

The software-component processes the request in background but still the Dcm has to issue the call again to eventually obtain the result of the request.

M2 Parameter

CommonStructure::ServiceNeeds::DiagnosticProcessingStyleEnum.processingStyleAsynchronous

Mapping Rule	Mapping Type
DiagnosticServiceSwMapping is having a BswServiceDependency and ServiceNeeds::Diagnostic ProcessingStyleEnum is equal to processingStyleAsynchronous	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort
BSW Parameter	BSW Type
USE_DATA_SENDER_RECEIVER	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

The DCM will access the Data using an Port requiring a SenderReceiverInterface (with isService=false) DataServices_{Data}. The Port is namedDataServices_{Data} where {Data} is the name of the container DcmDspData.

Template Description

This represents the ability to define a mapping of a diagnostic service to a software-component.

This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in Service Interfaces on the adaptive platform.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDataUsePort
BSW Parameter	BSW Type
USE_DATA_SENDER_RECEIVER_AS_SERVICE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The DCM will access the Data using a service Port requiring a SenderReceiverInterface (with isService=true) Data Services_{Data}. The Port is namedDataServices_{Data} where {Data} is the name of the container DcmDspData.	
Template Description	
This represents the ability to define a mapping of a diagnostic service to a software-component. This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in Service Interfaces on the adaptive platform.	
M2 Parameter	
DiagnosticExtract::ServiceMapping:: DiagnosticServiceDataMapping	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDataWriteFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request application to write the data value of a DID. (WriteData-function). This parameter is related to the interface Xxx_WriteData.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency	
Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00670]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDiagnosisScaling/DcmDspAlternativeData
BSW Parameter	BSW Type
DcmDspTextTableMapping	
BSW Description	
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).	
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.	





Template Description	
This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.	
Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuMethod	
Mapping Rule	Mapping Type
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDiagnosisScaling/DcmDspAlternativeData Type/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The data value in the diagnosis representation.	
Template Description	
This represents a textual constant in the computation method.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuConstTextContent.vt	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspDiagnosisScaling/DcmDspAlternativeData Type/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The ECU internal data value.	
Template Description	
CompuScale.lowerLimit: This specifies the lower limit of the scale.	
CompuScale.upperLimit: This specifies the upper limit of a of the scale.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dcm_01000]
-------	------------------

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspDidDataSupportInfo	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	This container defines the supported information.
Template Description	
DiagnosticParameter.supportInfo:	
This attribute represents the ability to define which bit of the support info byte is representing this part of the PID.	
DiagnosticDataIdentifier.supportInfoByte:	
This attribute represents the supported information associated with the DiagnosticDataIdentifier.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. supportInfo , DiagnosticExtract::CommonDiagnostics::DiagnosticDataIdentifier. supportInfoByte	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01104]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspExternalSRDataElementClass/DcmDataElementInstance
BSW Parameter	BSW Type
DcmDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	Instance Reference to the primitive or array data which shall be read or written. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in ParameterInterfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationPrimitiveDataType of category VALUE or BOOLEAN or ApplicationArrayType or if the AutosarDataPrototype is typed with a ImplementationDataType of category VALUE, ARRAY or TYPE_REFERENCE that in turn boils down to VALUE or ARRAY
Template Description	
This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping. mappedDataElement	
Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive data.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00991]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspExternalSRDataElementClass/DcmSubElementInDataElementInstance
BSW Parameter	BSW Type
DcmSubElementInDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	





Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationCompositeData Type.

Template Description

This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.[mappedDataElement](#)

Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00990]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData/DcmDspExternalSRDataElementClass/DcmSubElementInImplDataElementInstance
BSW Parameter	BSW Type
DcmSubElementInImplDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	

Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ImplementationDataType of category STRUCTURE or ARRAY. Please note that in case of ARRAY the index attribute in the target reference has to be set to select a single array element.

Template Description

This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.[mappedDataElement](#)

Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType ImplementationDataType of category STRUCTURE or ARRAY.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00992]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspData
BSW Parameter	BSW Type
DcmDspOdxDataDescription	ECUC-ADD-INFO-PARAM-DEF
BSW Description	
Defines additional description for ODX documentation	
Template Description	
This specifies the long name of the object. Long name is targeted to human readers and acts like a headline.	
M2 Parameter	
GenericStructure::GeneralTemplateClasses::Identifiable::MultilanguageReferable. longName	





Mapping Rule	Mapping Type
Textual description that characterizes the DID element with respect to the ODX long name can be provided by means of the attribute long-Name.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00988]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspDataDefaultEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the default endianness belonging to a DID, RID or PID if the corresponding data does not define an endianness.	
Template Description	
Defines the default endianness of the data belonging to a DID or RID which is applicable if the DiagnosticDataElement does not define the endianness via the swDataDefProps.baseType attribute.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. defaultEndianness	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00987]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspDid	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) of the DID.	
Template Description	
DiagnosticDataIdentifier: This meta-class represents the ability to model a diagnostic data identifier (DID) that is fully specified regarding the payload at configuration-time.	
DiagnosticDynamicDataIdentifier: This meta-class represents the ability to define a diagnostic data identifier (DID) at run-time.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics:: DiagnosticDataIdentifier , DiagnosticExtract::CommonDiagnostics:: DiagnosticDynamicDataIdentifier	
Mapping Rule	Mapping Type
If the DiagnosticDataIdentifier is referenced by DiagnosticDataByIdentifier, DiagnosticIOControl, or DiagnosticReadDataByPeriodicID, DiagnosticDataChangeTrigger	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00601]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDid
BSW Parameter	BSW Type





DcmDspDidIdentifier	ECUC-INTEGER-PARAM-DEF
BSW Description	
2 byte Identifier of the DID Within each DcmConfigSet all DcmDspDidIdentifier values shall be unique.	
Template Description	
DiagnosticAbstractDataIdentifier.id: This is the numerical identifier used to identify the DiagnosticAbstractDataIdentifier in the scope of diagnostic workflow	
DiagnosticValueNeeds.didNumber: This represents a Data identifier for the diagnostic value. This allows to predefine the DID number if the responsible function developer has received a particular requirement from the OEM or from a standardization body.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticAbstractDataIdentifier.id, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.didNumber	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00602]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDid/DcmDspDidSignal
BSW Parameter	BSW Type
DcmDspDidByteOffset	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the absolute byte offset of the data defined by DcmDspDidDataRef reference to DcmDspData container in the DID.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter.bitOffset	
Mapping Rule	Mapping Type
bitOffset / 8	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01105]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDid
BSW Parameter	BSW Type
DcmDspDidSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Length of a DID in byte(s).	
Template Description	
This attribute indicates the size in bytes of the DiagnosticDataIdentifier.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataIdentifier.didSize	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01099]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDid
BSW Parameter	BSW Type
DcmDspDidSupportInfo	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container defines the support information to declare the usability of the data bytes within the DIDs	
Template Description	
This attribute represents the supported information associated with the DiagnosticDataIdentifier.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataIdentifier. supportInfoByte	
Mapping Rule	Mapping Type
	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01102]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo
BSW Parameter	BSW Type
DcmDspDD DIDMaxElements	ECUC-INTEGER-PARAM-DEF
BSW Description	
Maximum number of source elements of a DDDID.	
Template Description	
This represents the maximum number of source elements of the dynamically created DID.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier::DiagnosticDynamicallyDefineDataIdentifier. maxSourceElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00970]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl
BSW Parameter	BSW Type
DcmDspDidControlSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to DcmDspSecurityRow Security levels allowed to control this DID. If there is no reference, no check of security level shall be done.	
Template Description	
This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00620]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl
BSW Parameter	BSW Type
DcmDspDidControlSessionRef	ECUC-REFERENCE-DEF
BSW Description	Reference to DcmDspSessionRow Sessions allowed to control this DID. If there is no reference, no check of session level shall be done.
Template Description	This represents the associated DiagnosticSessions
M2 Parameter	DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00621]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl
BSW Parameter	BSW Type
DcmDspDidGetCurrentState	ECUC-BOOLEAN-PARAM-DEF
BSW Description	This indicates the presence of "GetCurrentState".
Template Description	
DiagnosticIOControl.freezeCurrentState:	Setting this attribute to true represents the ability of the Dcm to execute a freezeCurrentState.
DiagnosticIOControlNeeds.freezeCurrentStateSupported:	This attribute determines, if the referenced port supports temporary freezing of I/O value.
M2 Parameter	DiagnosticExtract::Dcm::DiagnosticService::IOControl::DiagnosticIOControl. freezeCurrentState , Common Structure::ServiceNeeds::DiagnosticIOControlNeeds. freezeCurrentStateSupported
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00624]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl
BSW Parameter	BSW Type
DcmDspDidResetToDefault	ECUC-BOOLEAN-PARAM-DEF
BSW Description	





This indicates the presence of "ResetToDefault".

Template Description

DiagnosticIOControl.resetToDefault:

Setting this attribute to true represents the ability of the Dcm to execute a resetToDefault.

DiagnosticIoControlNeeds.resetToDefaultSupported:

This represents a flag for the existence of the ResetToDefault operation in the service interface.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::IOControl::DiagnosticIOControl.[resetToDefault](#), CommonStructure::ServiceNeeds::DiagnosticIoControlNeeds.[resetToDefaultSupported](#)

Mapping Rule	Mapping Type
1:1 mapping	full

Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00623]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidControl
BSW Parameter	BSW Type

DcmDspDidShortTermAdjustment ECUC-BOOLEAN-PARAM-DEF

BSW Description

This indicates the presence of "ShortTermAdjustment".

Template Description

DiagnosticIOControl.shortTermAdjustment:

Setting this attribute to true represents the ability of the Dcm to execute a shortTermAdjustment.

DiagnosticIoControlNeeds.shortTermAdjustmentSupported:

This attribute determines, if the referenced port supports temporarily setting of I/O value to a specific value provided by the diagnostic tester.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::IOControl::DiagnosticIOControl.[shortTermAdjustment](#), CommonStructure::ServiceNeeds::DiagnosticIoControlNeeds.[shortTermAdjustmentSupported](#)

Mapping Rule	Mapping Type
1:1 mapping	full

Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00625]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo
BSW Parameter	BSW Type

DcmDspDidDynamicallyDefined ECUC-BOOLEAN-PARAM-DEF

BSW Description

Indicates if this DID can be dynamically defined

true = DID can be dynamically defined false = DID can not be dynamically defined

Template Description

DiagnosticDataIdentifier:

This meta-class represents the ability to model a diagnostic data identifier (DID) that is fully specified regarding the payload at configuration-time.

DiagnosticDynamicDataIdentifier:

This meta-class represents the ability to define a diagnostic data identifier (DID) at run-time.





M2 Parameter		
DiagnosticExtract::CommonDiagnostics:: DiagnosticDataIdentifier , DiagnosticExtract::CommonDiagnostics:: DiagnosticDynamicDataIdentifier		
Mapping Rule		Mapping Type
true: in case the DiagnosticAbstractDataIdentifier for the DID value is aggregated by Diagnostic DynamicDataIdentifier false: in case the DiagnosticAbstractDataIdentifier for the DID value is aggregated by DiagnosticDataIdentifier		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00612]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidRead	
BSW Parameter	BSW Type	
DcmDspDidReadSecurityLevelRef	ECUC-REFERENCE-DEF	
BSW Description		
Reference to DcmDspSecurityRow Referenced security levels are allowed to read this DID. If there is no reference, no check of security level shall be done.		
Template Description		
This represents the associated DiagnosticSecurityLevels		
M2 Parameter		
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel		
Mapping Rule		Mapping Type
1:1 mapping		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00614]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidRead	
BSW Parameter	BSW Type	
DcmDspDidReadSessionRef	ECUC-REFERENCE-DEF	
BSW Description		
Reference to DcmDspSessionRow Referenced sessions are allowed to read this DID. If there is no reference, no check of session level shall be done.		
Template Description		
This represents the associated DiagnosticSessions		
M2 Parameter		
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession		
Mapping Rule		Mapping Type
1:1 mapping		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00615]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidWrite
BSW Parameter	BSW Type





DcmDspDidWriteSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to DcmDspSecurityRow Referenced security levels are allowed to write this DID. If there is no reference, no check of security level shall be done.	
Template Description	
This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00617]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspDidInfo/DcmDspDidWrite
BSW Parameter	BSW Type
DcmDspDidWriteSessionRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to DcmDspSessionRow Referenced sessions are allowed to write this DID. If there is no reference, no check of session level shall be done.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00618]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspEcuReset/DcmDspEcuResetRow
BSW Parameter	BSW Type
DcmDspEcuResetId	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the subfunction ID	
Template Description	
This represents the maximum number of source elements of the dynamically created DID.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier::DiagnosticDynamicallyDefineDataIdentifier. maxSourceElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01113]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspEcuReset/DcmDspEcuResetRow
BSW Parameter	BSW Type
DcmResponseToEcuReset	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the answer to EcuReset service should come: Before or after the reset.	
Template Description	
This attribute defines whether the response to the EcuReset service shall be transmitted before or after the actual reset.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EcuReset::DiagnosticEcuResetClass. respondToReset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01039]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspEcuReset/DcmDspEcuResetRow/DcmResponseToEcuReset
BSW Parameter	BSW Type
AFTER_RESET	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Answer to EcuReset service should come after the reset.	
Template Description	
Answer to EcuReset service should come after the reset.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EcuReset::DiagnosticResponseToEcuResetEnum. respondAfterReset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspEcuReset/DcmDspEcuResetRow/DcmResponseToEcuReset
BSW Parameter	BSW Type
BEFORE_RESET	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Answer to EcuReset service should come before the reset.	
Template Description	
Answer to EcuReset service should come before the reset.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EcuReset::DiagnosticResponseToEcuResetEnum. respondBeforeReset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp			
BSW Parameter	BSW Type			
DcmDspMaxDidToRead	ECUC-INTEGER-PARAM-DEF			
BSW Description				
Indicates the maximum allowed DIDs in a single "ReadDataByIdentifier" request.				
Template Description				
This attribute represents the maximum number of allowed DIDs in a single instance of DiagnosticReadDataByIdentifier.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::DataByIdentifier::DiagnosticReadDataByIdentifierClass. maxDidToRead				
Mapping Rule	Mapping Type			
1:1 mapping	full			
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00638]			

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp			
BSW Parameter	BSW Type			
DcmDspMaxPeriodicDidToRead	ECUC-INTEGER-PARAM-DEF			
BSW Description				
Indicates the maximum allowed periodicDIDs which can be read in a single "ReadDataByPeriodicIdentifier" request.				
Template Description				
This represents the maximum number of data identifiers that can be included in one request.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticReadDataByPeriodicIDClass. maxPeriodicDidToRead				
Mapping Rule	Mapping Type			
1:1 mapping	full			
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00956]			

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo			
BSW Parameter	BSW Type			
DcmDspMemoryIdValue	ECUC-INTEGER-PARAM-DEF			
BSW Description				
Value of the memory device identifier used.				
Each DcmDspMemoryIdInfo should have a unique ID.				
The MemoryIdValue is retrieved from the request messages (RMBA,WMBA,RD,RU,DDDI) according to ISO-14229-1 with the most significant byte of the request parameter memoryAddress.				
Template Description				
This represents the identification of the memory segment.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. id				
Mapping Rule	Mapping Type			





1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00913]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeByLabelHigh	ECUC-STRING-PARAM-DEF
BSW Description	
High memory address as label (string) of a range allowed for reading.	
Template Description	
This represents a symbolic label for the upper bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryHighAddressLabel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01070]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeByLabelLow	ECUC-STRING-PARAM-DEF
BSW Description	
Low memory address as label (string) of a range allowed for reading.	
Template Description	
This represents a symbolic label for the lower bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryLowAddressLabel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01069]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the Security Access Levels needed for read access on this memory address. If there is no reference, no check of security level shall be done.	
Template Description	





This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
DiagnosticMemoryIdentifier referenced in the role memoryRange is referenced by a Diagnostic ReadMemoryByAddress The accessPermission holds the security level information.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01071]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the session level needed for access to this memory address range. If there is no reference, no check of session level shall be done.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01088]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeHigh	ECUC-INTEGER-PARAM-DEF
BSW Description	
High memory address of a range allowed for reading	
Template Description	
This represents the upper bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryHighAddress	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00787]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemory RangeInfo





BSW Parameter	BSW Type
DcmDspReadMemoryRangeLow	ECUC-INTEGER-PARAM-DEF
BSW Description	
Low memory address of a range allowed for reading	
Template Description	
This represents the lower bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryLowAddress	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00786]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemoryRangeInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the Security Access Levels needed for read access on this memory address. If there is no reference, no check of security level shall be done.	
Template Description	
This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
DiagnosticMemoryIdentifier referenced in the role memoryRange is referenced by a Diagnostic ReadMemoryByAddress. The accessPermission holds the security level information.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00788]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspReadMemoryRangeInfo
BSW Parameter	BSW Type
DcmDspReadMemoryRangeSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the session level needed for access to this memory address range.	
If there is no reference, no check of session level shall be done.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01086]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeByLabelHigh	ECUC-STRING-PARAM-DEF
BSW Description	
High memory address as label (string) of a range allowed for writing.	
Template Description	
This represents a symbolic label for the upper bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryHighAddressLabel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01075]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeByLabelLow	ECUC-STRING-PARAM-DEF
BSW Description	
Low memory address as label (string) of a range allowed for writing.	
Template Description	
This represents a symbolic label for the lower bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryLowAddressLabel	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01074]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemory RangeByLabelInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the Security Access Levels needed for write access on this memory address. If there is no reference, no check of security level shall be done.	
Template Description	
This represents the associated DiagnosticSecurityLevels	





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
DiagnosticMemoryIdentifier referenced in the role memoryRange is referenced by a DiagnosticWriteMemoryByAddress. The accessPermission holds the security level information.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01076]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemoryRangeByLabelInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the session level needed for access to this memory address range. If there is no reference, no check of session level shall be done.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01089]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemoryRangeInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeHigh	ECUC-INTEGER-PARAM-DEF
BSW Description	
High memory address of a range allowed for writing.	
Template Description	
This represents the upper bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryHighAddress	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00791]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemoryRangeInfo
BSW Parameter	BSW Type





DcmDspWriteMemoryRangeLow	ECUC-INTEGER-PARAM-DEF
BSW Description	
Low memory address of a range allowed for writing	
Template Description	
This represents the lower bound for addresses of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier. memoryLowAddress	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00790]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemoryRangeInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeSecurityLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the Security Access Levels needed for write access on this memory address. If there is no reference, no check of security level shall be done.	
Template Description	
This represents the associated DiagnosticSecurityLevels	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. securityLevel	
Mapping Rule	Mapping Type
DiagnosticMemoryIdentifier referenced in the role memoryRange is referenced by a Diagnostic WriteMemoryByAddress. The accessPermission holds the security level information.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00793]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemory/DcmDspMemoryIdInfo/DcmDspWriteMemoryRangeInfo
BSW Parameter	BSW Type
DcmDspWriteMemoryRangeSessionLevelRef	ECUC-REFERENCE-DEF
BSW Description	
Link to the session level needed for access to this memory address range. If there is no reference, no check of session level shall be done.	
Template Description	
This represents the associated DiagnosticSessions	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticAccessPermission. diagnosticSession	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dcm_01087]
-------	------------------

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspMemoryTransfer/DcmDspMemoryTransferIdInfo
BSW Parameter	BSW Type
DcmDspMemoryIdValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Value of the memory device identifier used. Each DcmDspMemoryIdInfo should have a unique ID. The MemoryIdValue is retrieved from the request messages (RMBA,WMBA,RD,RU,DDDI) according to ISO-14229-1 with the most significant byte of the request parameter memoryAddress.	
Template Description	
This represents the identification of the memory segment.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::MemoryByAddress::DiagnosticMemoryIdentifier.id	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01138]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPeriodicTransmission
BSW Parameter	BSW Type
DcmDspMaxPeriodicDidScheduler	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the maximum number of periodicDataIdentifiers that can be scheduled concurrently.	
Template Description	
This represents the maximum number of periodic data identifiers that can be scheduled in parallel.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticReadDataByPeriodicIDClass.schedulerMaxNumber	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00962]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPeriodicTransmission
BSW Parameter	BSW Type
DcmDspPeriodicTransmissionFastRate	ECUC-FLOAT-PARAM-DEF
BSW Description	
This parameter give the transmission rate of the requested periodicDataIdentifiers to be used if the parameter transmission Mode given in the ReadDataByPeriodicID request is equal to 0x03 ("sendAtFastRate"). This parameter value in seconds have to be configured as a multiple of DcmTaskTime. min: A negative value and zero is not allowed.	





Template Description	
DiagnosticPeriodicRate.period: This represents the period of the DiagnosticPeriodicRate in seconds.	
DiagnosticPeriodicRate.periodicRateCategory: This attribute represents the category of the periodic rate.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate. <i>period</i> , Diagnostic Extract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate. <i>periodicRateCategory</i>	
Mapping Rule	
The parameter shall exist if DiagnosticPeriodicRate.periodicRateCategory is set to Diagnostic PeriodicRateCategoryEnum.periodicRateFast.	full
Mapping Status	
valid	[ECUC_Dcm_00960]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPeriodicTransmission
BSW Parameter	BSW Type
DcmDspPeriodicTransmissionMediumRate	ECUC-FLOAT-PARAM-DEF
BSW Description	
This parameter give the transmission rate of the requested periodicDataIdentifiers to be used if the parameter transmission Mode given in the ReadDataByPeriodicID request is equal to 0x02 ("sendAtMediumRate"). This parameter value in seconds have to be configured as a multiple of DcmTaskTime.	
min: A negative value and zero is not allowed.	
Template Description	
DiagnosticPeriodicRate.period: This represents the period of the DiagnosticPeriodicRate in seconds.	
DiagnosticPeriodicRate.periodicRateCategory: This attribute represents the category of the periodic rate.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate. <i>period</i> , Diagnostic Extract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate. <i>periodicRateCategory</i>	
Mapping Rule	
The parameter shall exist if DiagnosticPeriodicRate.periodicRateCategory is set to Diagnostic PeriodicRateCategoryEnum.periodicRateMedium.	full
Mapping Status	
valid	[ECUC_Dcm_00959]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPeriodicTransmission
BSW Parameter	BSW Type
DcmDspPeriodicTransmissionSlowRate	ECUC-FLOAT-PARAM-DEF
BSW Description	
This parameter give the transmission rate of the requested periodicDataIdentifiers to be used if the parameter transmission Mode given in the ReadDataByPeriodicID request is equal to 0x01 ("sendAtSlowRate"). This parameter value in seconds have to be configured as a multiple of DcmTaskTime.	
min: A negative value and zero is not allowed.	
Template Description	




DiagnosticPeriodicRate.period:

This represents the period of the DiagnosticPeriodicRate in seconds.

DiagnosticPeriodicRate.periodicRateCategory:

This attribute represents the category of the periodic rate.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate.[period](#), Diagnostic Extract::Dcm::DiagnosticService::ReadDataByPeriodicID::DiagnosticPeriodicRate.[periodicRateCategory](#)

Mapping Rule
Mapping Type

The parameter shall exist if DiagnosticPeriodicRate.periodicRateCategory is set to DiagnosticPeriodicRateCategoryEnum.periodicRateSlow.

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_00958]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp

BSW Parameter
BSW Type

DcmDspPid

ECUC-PARAM-CONF-CONTAINER-DEF

BSW Description

This container defines the availability of a PID to the DCM.

Template Description

This meta-class represents the ability to model a diagnostic parameter identifier (PID) for the purpose of executing on-board diagnostics (OBD).

M2 Parameter

DiagnosticExtract::CommonDiagnostics::[DiagnosticParameterIdentifier](#)

Mapping Rule
Mapping Type

1:1 mapping

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_00626]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid

BSW Parameter
BSW Type

DcmDspPidData

ECUC-PARAM-CONF-CONTAINER-DEF

BSW Description

This container defines the parameter for a Signal in the PID.

Template Description

This represents the data carried by the DiagnosticParameterIdentifier.

M2 Parameter

DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier.[dataElement](#)

Mapping Rule
Mapping Type

1:1 mapping

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_00865]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData
BSW Parameter	BSW Type
DcmDspPidByteOffset	ECUC-INTEGER-PARAM-DEF
BSW Description	
This is the position in bytes of the PID structure and will not start at position 0 in case a support information is available (for packeted PIDs).	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. bitOffset	
Mapping Rule	Mapping Type
bitOffset / 8	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01107]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData
BSW Parameter	BSW Type
DcmDspPidDataByteSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the array length in bytes or the maximum array length for variable datalengths.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
S/R via array: DcmDspPidDataByteSize= maxNumberOfElements * (baseTypeSize / 8) C/S of FNC callback: DcmDspPidDataByteSize= maxNumberOfElements Note: 8 is the baseTypeSize of UINT8	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01108]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData
BSW Parameter	BSW Type
DcmDspPidDataSupportInfo	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container defines the supported information.	
Template Description	
This attribute represents the ability to define which bit of the support info byte is representing this part of the PID.	
M2 Parameter	





DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. supportInfo	
Mapping Rule	Mapping Type
Applicable if the DiagnosticParameter is owned by a DiagnosticParameterIdentifier	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00874]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidDataSupportInfo
BSW Parameter	BSW Type
DcmDspPidDataSupportInfoBit	ECUC-INTEGER-PARAM-DEF
BSW Description	
Referenced Bit of the SupportInfo	
Template Description	
defines the bit in the SupportInfo byte, which represents the PID DataElement pidSize / position / size. Unit: byte.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterSupportInfo. supportInfoBit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00876]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidDataSupportInfo
BSW Parameter	BSW Type
DcmDspPidDataSupportInfoRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to DcmDspPidSupportInfo	
Template Description	
This represents the supported information associated with the DiagnosticParameterIdentifier.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. supportInfoByte	
Mapping Rule	Mapping Type
Shall refer to the DiagnosticParameterIdentifier.supportInfoByte of the enclosing Diagnostic ParameterIdentifier	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00875]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDsp DiagnosisScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	





The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).

In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.

Template Description

This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.

Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.

M2 Parameter

AsamHdo::ComputationMethod::CompuMethod

Mapping Rule

This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.

Mapping Type

full

Mapping Status

ECUC Parameter ID

valid

[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDsp DiagnosisScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping

BSW Parameter

BSW Type

DcmDspDiagnosisRepresentationDataValue

ECUC-INTEGER-PARAM-DEF

BSW Description

The data value in the diagnosis representation.

Template Description

This represents a textual constant in the computation method.

M2 Parameter

AsamHdo::ComputationMethod::CompuConstTextContent.vt

Mapping Rule

Mapping Type

1:1 mapping

full

Mapping Status

ECUC Parameter ID

valid

[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDsp DiagnosisScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping

BSW Parameter

BSW Type

DcmDsplInternalDataValue

ECUC-INTEGER-PARAM-DEF

BSW Description

The ECU internal data value.

Template Description

CompuScale.lowerLimit:

This specifies the lower limit of the scale.

CompuScale.upperLimit:

This specifies the upper limit of a of the scale.





M2 Parameter	
AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01000]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataEndianness
BSW Parameter	BSW Type
BIG_ENDIAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Most significant byte shall be stored at the lowest address.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder	
Mapping Rule	Mapping Type
BaseTypeDirectDefinition.byteOrder == ByteOrderEnum.mostSignificantByteFirst	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataEndianness
BSW Parameter	BSW Type
LITTLE_ENDIAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Most significant byte shall be stored at the highest address	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder	
Mapping Rule	Mapping Type
BaseTypeDirectDefinition.byteOrder == ByteOrderEnum.mostSignificantByteLast	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataEndianness
BSW Parameter	BSW Type
OPAQUE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Opaque data endianness	





Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder	
Mapping Rule	Mapping Type
BaseTypeDirectDefinition.byteOrder == ByteOrderEnum.opaque	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01
BSW Parameter	BSW Type
DcmDspPidDataReadFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name for reading PID data value. This is only relevant if DcmDspPidDataUsePort==USE_DATA_SYNCH_FNC.	
This parameter is related to the interface Xxx_ReadData.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency	
Mapping Rule	Mapping Type
The BswServiceDependency should have aRoleBasedBswModuleEntryAssignment that in turn has attribute role set to xxx_ReadData and points to a BswModuleEntry.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00629]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is boolean.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = BOOLEAN baseTypeSize = 1	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = 2C baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = 2C baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is sint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType	
BSW Parameter	BSW Type	
SINT8	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	Type of the data is sint8.	
Template Description		
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.		
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.		
M2 Parameter		
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize		
Mapping Rule	Mapping Type	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = 2C baseTypeSize = 8		
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType	
BSW Parameter	BSW Type	
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	Type of the data is sint8 array.	
Template Description		
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.		
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.		
DiagnosticDataElement.arraySizeSemantics:		
This attribute controls the meaning of the value of the array size.		
DiagnosticDataElement.maxNumberOfElements:		
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.		
M2 Parameter		
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements		
Mapping Rule	Mapping Type	
baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)		
Mapping Status	ECUC Parameter ID	





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , Diagnostic Extract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , Diagnostic Extract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticParameter Identifier.dataElement baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPid DataType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , Diagnostic Extract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort	
BSW Parameter	BSW Type	
USE_DATA_SENDER_RECEIVER	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
This represents the ability to define a mapping of a diagnostic service to a software-component.		
This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in Service Interfaces on the adaptive platform.		
M2 Parameter		
DiagnosticExtract::ServiceMapping:: DiagnosticServiceDataMapping		
Mapping Rule	Mapping Type	
DiagnosticServiceDataMapping.diagnosticDataElement refers to a DiagnosticDataElement that in turn is aggregated in the PID definition where the PortPrototype referenced in the role mapped DataElement.contextPort refers to a DataInterface where attribute isService is set to false.	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort	
BSW Parameter	BSW Type	
USE_DATA_SENDER_RECEIVER_AS_SERVICE	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
This represents the ability to define a mapping of a diagnostic service to a software-component.		
This kind of service mapping is applicable for the usage of SenderReceiverInterfaces or event/notifier semantics in Service Interfaces on the adaptive platform.		
M2 Parameter		
DiagnosticExtract::ServiceMapping:: DiagnosticServiceDataMapping		
Mapping Rule	Mapping Type	
DiagnosticServiceDataMapping.diagnosticDataElement refers to a DiagnosticDataElement that in turn is aggregated in the PID definition where the PortPrototype referenced in the role mapped DataElement.contextPort refers to a DataInterface where attribute isService is set to true.	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort	
BSW Parameter	BSW Type	
USE_DATA_SYNCH_CLIENT_SERVER	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		





Template Description	
This represents the ability to define a mapping of a diagnostic service to a software-component or a basic-software module. If the former is used then this kind of service mapping is applicable for the usage of ClientServerInterfaces.	
M2 Parameter	
DiagnosticExtract::ServiceMapping:: DiagnosticServiceSwMapping	
Mapping Rule	Mapping Type
DiagnosticServiceSwMapping.diagnosticDataElement refers to a DiagnosticDataElement that in turn is aggregated in the PID definition. DiagnosticServiceSwMapping.mappedSwcService Dependency shall exist.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidDataUsePort
BSW Parameter	BSW Type
USE_DATA_SYNCH_FNC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
This represents the ability to define a mapping of a diagnostic service to a software-component or a basic-software module. If the former is used then this kind of service mapping is applicable for the usage of ClientServerInterfaces.	
M2 Parameter	
DiagnosticExtract::ServiceMapping:: DiagnosticServiceSwMapping	
Mapping Rule	Mapping Type
DiagnosticServiceSwMapping.diagnosticDataElement refers to a DiagnosticDataElement that in turn is aggregated in the PID definition and that also defines the role mappedBswService Dependency.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidService01ExternalSRDataElementClass/DcmDataElementInstance
BSW Parameter	BSW Type
DcmDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	
Instance Reference to the primitive or array data which shall be read or written. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in ParameterInterfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationPrimitiveDataType of category VALUE or BOOLEAN or ApplicationArrayType or if the AutosarDataPrototype is typed with a ImplementationDataType of category VALUE, ARRAY or TYPE_REFERENCE that in turn boils down to VALUE or ARRAY	
Template Description	
This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping. mappedDataElement	
Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive data.	full





Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00991]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidService01ExternalSRDataElementClass/DcmSubElementInDataElementInstance
BSW Parameter	BSW Type
DcmSubElementInDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationCompositeDataType.
Template Description	
This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.	
M2 Parameter	DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.mappedDataElement
Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00990]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService01/DcmDspPidService01ExternalSRDataElementClass/DcmSubElementInImplDataElementInstance
BSW Parameter	BSW Type
DcmSubElementInImplDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ImplementationDataType of category STRUCTURE or ARRAY. Please note that in case of ARRAY the index attribute in the target reference has to be set to select a single array element.
Template Description	
This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.	
M2 Parameter	DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.mappedDataElement
Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType ImplementationDataType of category STRUCTURE or ARRAY.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00992]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidData/DcmDspPidService02
BSW Parameter	BSW Type
DcmDspPidDataDemRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to DemPidDataElement in DEM configuration. Allows to link the DCM PID and DEM PID configuration for Mode \$02.	
Template Description	
This represents the PID associated with this instance of the OBD mode 0x02 service.	
M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData::DiagnosticPowertrainFreezeFrame. pid	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00887]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid
BSW Parameter	BSW Type
DcmDspPidIdentifier	ECUC-INTEGER-PARAM-DEF
BSW Description	
1 byte Identifier of the PID	
Within each DcmConfigSet all DcmDspPidIdentifier values shall be unique.	
Template Description	
OBDPidServiceNeeds.parameterId: Standardized parameter identifier (PID) according to the OBD standard specified in attribute "standard".	
DiagnosticParameterIdentifier.id: This is the numerical identifier used to identify the DiagnosticParameterIdentifier in the scope of diagnostic workflow (see SAE J1979-DA).	
M2 Parameter	
CommonStructure::ServiceNeeds::OBDPidServiceNeeds. parameterId , DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. id	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00627]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidService
BSW Parameter	BSW Type
DCM_SERVICE_01	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
A PID is used with service \$01 only.	
Template Description	
This represents the PID associated with this instance of the OBD mode 0x01 service.	





M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x01_RequestCurrentPowertrainDiagnosticData::DiagnosticRequestCurrentPowertrainData. pid	
Mapping Rule	Mapping Type
Applicable if the DiagnosticParameterIdentifier is only referenced by a DiagnosticRequestCurrentPowertrainData	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidService	
BSW Parameter	BSW Type	
DCM_SERVICE_01_02	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	A PID is used with service \$01 and \$02. Allowed with a PID configuration containing data elements on byte basis.	
Template Description		
DiagnosticRequestCurrentPowertrainData.pid: This represents the PID associated with this instance of the OBD mode 0x01 service.		
DiagnosticPowertrainFreezeFrame.pid: This represents the PID associated with this instance of the OBD mode 0x02 service.		
M2 Parameter		
DiagnosticExtract::Dcm::ObdService::Mode_0x01_RequestCurrentPowertrainDiagnosticData::DiagnosticRequestCurrentPowertrainData. pid , DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData::DiagnosticPowertrainFreezeFrame. pid		
Mapping Rule	Mapping Type	
Applicable if the DiagnosticParameterIdentifier is referenced by both a DiagnosticRequestCurrentPowertrainData and a DiagnosticPowertrainFreezeFrame	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidService	
BSW Parameter	BSW Type	
DCM_SERVICE_02	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	A PID is used with service \$02 only. Allowed with a PID configuration containing data elements on byte basis.	
Template Description		
This represents the PID associated with this instance of the OBD mode 0x02 service.		
M2 Parameter		
DiagnosticExtract::Dcm::ObdService::Mode_0x02_RequestPowertrainFreezeFrameData::DiagnosticPowertrainFreezeFrame. pid		
Mapping Rule	Mapping Type	
Applicable if the DiagnosticParameterIdentifier is only referenced by a DiagnosticPowertrainFreezeFrame	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid
BSW Parameter	BSW Type
DcmDspPidSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Length of a PID in byte(s).	
Template Description	
The size of the entire PID can be greater than the sum of the data elements because padding might be applied. Unit: byte.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. pidSize	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00870]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid
BSW Parameter	BSW Type
DcmDspPidSupportInfo	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container defines the support information (typically byte A) to declare the usability of the data bytes within the so-called packeted PIDs (e.g. PID\$68).	
Template Description	
This represents the supported information associated with the DiagnosticParameterIdentifier.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. supportInfoByte	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00871]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidSupportInfo
BSW Parameter	BSW Type
DcmDspPidSupportInfoLen	ECUC-INTEGER-PARAM-DEF
BSW Description	
Length of the support information in bytes.	
Template Description	
This represents the size of the supportInfo within the PID. Unit: byte.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticSupportInfoByte. size	
Mapping Rule	Mapping Type
	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00873]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspPid/DcmDspPidSupportInfo
BSW Parameter	BSW Type
DcmDspPidSupportInfoPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Position of the support information in bytes.	
Template Description	
This represents the position of the supportInfo in the PID. Unit: byte.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticSupportInfoByte. position	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00872]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspRequestControl	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) of the "Request control of on-board system, test or component" service (Service \$08). The DCM will request the control using an R-Port requiring a PortInterface RequestControlServices_{Tid}. The R-Port is named RequestControlServices_{Tid} where {Tid} is the name of the container DcmDspRequestControl.	
Template Description	
This meta-class represents the ability to model an instance of the OBD mode 0x08 service.	
M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice:: DiagnosticRequestControlOfOnBoardDevice	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00637]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRequestControl
BSW Parameter	BSW Type
DcmDspRequestControlInBufferSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Number of bytes to be provided in the input buffer of the interface RequestControlServices_{Tid} for OBD Service \$08	
Template Description	
This represents the specified data size for the request message. Unit: byte.	
M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice::DiagnosticTestRoutineIdentifier. requestDataSize	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00722]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRequestControl
BSW Parameter	BSW Type
DcmDspRequestControlOutBufferSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Number of bytes to be provided in the output buffer of the interface RequestControlServices_{Tid} for OBD Service \$08	
Template Description	
This represents the specified data size for the response message. Unit:byte.	
M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice::DiagnosticTestRoutineIdentifier. responseContentSize	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00723]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRequestControl
BSW Parameter	BSW Type
DcmDspRequestControlTestId	ECUC-INTEGER-PARAM-DEF
BSW Description	
Test Id for Service \$08	
Template Description	
ObdControlServiceNeeds.testId: Test Identifier (TID) according to ISO 15031-5.	
DiagnosticTestRoutineIdentifier.id: This represents the numerical id of the DiagnosticTestIdentifier (see SAE J1979-DA).	
M2 Parameter	
CommonStructure::ServiceNeeds::ObdControlServiceNeeds. testId , DiagnosticExtract::Dcm::ObdService::Mode_0x08_RequestControlOfOnBoardDevice::DiagnosticTestRoutineIdentifier. id	
Mapping Rule	Mapping Type
The value shall be taken from DiagnosticRequestControlOfOnBoardDevice.testId.id if available.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00656]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspRequestFileTransfer	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration for RequestFileTransfer. This container only exists if RequestFileTransfer is configured.	
Template Description	





This diagnostic service instance implements the UDS service 0x38.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::RequestFileTransfer::DiagnosticRequestFileTransfer

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01034]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEvent/DcmDspRoeEventProperties/DcmDspRoeOnChangeOfDataIdentifier
BSW Parameter	BSW Type
DcmDspRoeDidRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to a Did which is watched.	
Template Description	
This represents the corresponding DiagnosticDataIdentifier.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticDataChangeTrigger.dataIdentifier	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00979]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEvent/DcmDspRoeEventProperties/DcmDspRoeOnDTCStatusChange
BSW Parameter	BSW Type
DcmDspRoeDTCStatusMask	ECUC-INTEGER-PARAM-DEF
BSW Description	
Value of the relevant DTCStatusMask	
Template Description	
This attribute represents the ability to define a status mask for the triggering of an ROE response on the change of a DTC.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticDtcChangeTrigger.dtcStatusMask	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01109]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEvent
BSW Parameter	BSW Type
DcmDspRoeInitialEventStatus	ECUC-ENUMERATION-PARAM-DEF
BSW Description	





Initial Roe status of this RoeEvent	
Template Description	
This represents the initial status of the enclosing DiagnosticResponseOnEventTrigger.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticResponseOnEventTrigger. <i>initialEventStatus</i>	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00980]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEvent/DcmDspRoeInitialEventStatus
BSW Parameter	BSW Type
DCM_ROE_CLEARED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
This means that the ResponseOnEvent is initially cleared.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticInitialEventStatusEnum. <i>returnOnEventCleared</i>	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEvent/DcmDspRoeInitialEventStatus
BSW Parameter	BSW Type
DCM_ROE_STOPPED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
This means that the ResponseOnEvent is initially stopped.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticInitialEventStatusEnum. <i>returnOnEventStopped</i>	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe
BSW Parameter	BSW Type
DcmDspRoeEventWindowTime	ECUC-PARAM-CONF-CONTAINER-DEF





BSW Description	
This container configures the available EventWindowTime in this Ecu.	
This container contains a sub-set of EventWindowTimes supported by the Dcm, to limit the Ecu resources.	
Template Description	
This attribute clarifies the validity of the eventWindow	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticEventWindow.eventWindowTime	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dcm_00981]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEventWindowTime/DcmDspRoeEventWindowTime
BSW Parameter	BSW Type
DCM_ROE_EVENT_WINDOW_CURRENT_AND_FOLLOWING_CYCLE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
This means that the window extends to this and the following cycle.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticEventWindowTimeEnum.eventWindowCurrentAndFollowingCycle	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEventWindowTime/DcmDspRoeEventWindowTime
BSW Parameter	BSW Type
DCM_ROE_EVENT_WINDOW_CURRENT_CYCLE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
This means that the window is limited to the current cycle.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticEventWindowTimeEnum.eventWindowCurrentCycle	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe/DcmDspRoeEventWindowTime/DcmDspRoeEventWindowTime			
BSW Parameter	BSW Type			
DCM_ROE_EVENT_WINDOW_INFINITE	ECUC-ENUMERATION-LITERAL-DEF			
BSW Description				
Template Description				
This means that the window extents without a border.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticEventWindowTimeEnum. eventWindowInfinite				
Mapping Rule	Mapping Type			
1:1 mapping	full			
Mapping Status	ECUC Parameter ID			
valid				

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoe			
BSW Parameter	BSW Type			
DcmDspRoeInterMessageTime	ECUC-FLOAT-PARAM-DEF			
BSW Description				
Provide the minimum time in seconds between two transmissions of ROE event. It is used for the delay between two different consecutive Roe transmissions.				
Template Description				
Provide the minimum time in seconds between two consecutive transmissions of an ROE event.				
M2 Parameter				
DiagnosticExtract::Dcm::DiagnosticService::ResponseOnEvent::DiagnosticResponseOnEventClass. interMessageTime				
Mapping Rule	Mapping Type			
1:1 mapping	full			
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00856]			

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp			
BSW Parameter	BSW Type			
DcmDspRoutine	ECUC-PARAM-CONF-CONTAINER-DEF			
BSW Description				
This container contains the configuration (parameters) for Routines				
Template Description				
This meta-class represents the ability to define a diagnostic routine.				
M2 Parameter				
DiagnosticExtract::CommonDiagnostics:: DiagnosticRoutine				
Mapping Rule	Mapping Type			
1:1 mapping	full			
Mapping Status	ECUC Parameter ID			
valid	[ECUC_Dcm_00640]			

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine
BSW Parameter	BSW Type
DcmDspRequestRoutineResults	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provides the configuration of RequestResult subservice for RoutineControl service. Existence indicates that the Request RoutineResults in the RoutineControl is supported.	
Template Description	
DiagnosticRoutine.requestResult: This represents the ability to request the result of a running routine.	
DiagnosticRoutineNeeds.diagRoutineType: This denotes the type of diagnostic routine which is implemented by the referenced server port.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticRoutine. requestResult , CommonStructure::ServiceNeeds::Diagnostic RoutineNeeds. diagRoutineType	
Mapping Rule	Mapping Type
1:1 mapping for DiagnosticRoutine.requestResult OR DiagnosticRoutineNeeds.diagRoutineTyoe == asynchronous	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01023]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults
BSW Parameter	BSW Type
DcmDspRequestRoutineResultsFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name for request to application the results of a routine. (Routine_RequestResults-function)	
This parameter is related to the interface Xxx_RequestResults.	
Template Description	
Specialization of ServiceDependency in the context of an BswInternalBehavior. It allows to associate BswModuleEntries and data defined for a BSW module or cluster to a given ServiceNeeds element.	
M2 Parameter	
BswModuleTemplate::BswBehavior:: BswServiceDependency	
Mapping Rule	Mapping Type
It could be possible to get the FNC name via BswServiceDependency	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00753]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults
BSW Parameter	BSW Type
DcmDspRequestRoutineResultsIn	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of input parameter of RequestResult subservice for RoutineControl service.	
Template Description	
This represents the request parameters.	





M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticRequestRoutineResults. request	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01116]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn
BSW Parameter	BSW Type
DcmDspRequestRoutineResultsInSignal	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provides description of a routine signal used in RoutineControl service.	
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataIn_n elements in the XXX_RequestResult function call.	
Template Description	
This represents the related dataElement of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01117]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).	
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.	
Template Description	
This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.	
Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.	
M2 Parameter	
AsamHdo::ComputationMethod:: CompuMethod	
Mapping Rule	Mapping Type





This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	The data value in the diagnosis representation.
Template Description	This represents a textual constant in the computation method.
M2 Parameter	AsamHdo::ComputationMethod::CompuConstTextContent.vt
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	The ECU internal data value.
Template Description	
CompuScale.lowerLimit:	This specifies the lower limit of the scale.
CompuScale.upperLimit:	This specifies the upper limit of a of the scale.
M2 Parameter	AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01000]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal
BSW Parameter	BSW Type
DcmDspRoutineParameterSize	ECUC-INTEGER-PARAM-DEF





BSW Description	
Provide the size of a RoutineControl parameter in bytes	
Template Description	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	Mapping Rule
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutineSignalLength = maxNumberOfElements * 8
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01119]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the endianness of the data belonging to a Routine In Signal for RequestResult subfunction.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	Mapping Rule
AsamHdo::BaseTypes::BaseTypeDirectDefinition. byteOrder	baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticRequestRoutineResult.response
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01121]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	Mapping Rule
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. bitOffset	1:1 mapping
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01118]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = BOOLEAN baseTypeSize = 1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type





FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	
valid	ECUC Parameter ID

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 16	full
Mapping Status	
valid	ECUC Parameter ID

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16 array.	





Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	full
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	full
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the signal is sint32 array.

Template Description

BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticDataElement.arraySizeSemantics:

This attribute controls the meaning of the value of the array size.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[arraySizeSemantics](#)

Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding:	
This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize:	
Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF





BSW Description	
Type of the signal is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type





UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-32, UTF-32 baseTypeSize = 32 max NumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8	
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequestRoutineResults.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf.TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemantics Enum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsIn/DcmDspRequestRoutineResultsInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize].	
This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	





M2 Parameter		
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics		
Mapping Rule		Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variableSize maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySizeSemantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)		full
Mapping Status		ECUC Parameter ID
valid		

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults
BSW Parameter	BSW Type
DcmDspRequestRoutineResultsOut	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of output parameter of RequestResult subservice for RoutineControl service.	
Template Description	
This represents the response parameters.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticRequestRoutineResults. response	
Mapping Rule	
1:1 mapping	
Mapping Status	
valid	
[ECUC_Dcm_00831]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut
BSW Parameter	BSW Type
DcmDspRequestRoutineResultsOutSignal	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provides description of a routine signal used in RoutineControl service.	
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataOutN elements in the XXX_RequestResult function call.	
Template Description	
This represents the related dataElement of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement	
Mapping Rule	
1:1 mapping	
Mapping Status	
valid	
[ECUC_Dcm_00836]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).	
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.	
Template Description	
This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.	
Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuMethod	
Mapping Rule	Mapping Type
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The data value in the diagnosis representation.	
Template Description	
This represents a textual constant in the computation method.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuConstTextContent.vt	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type





DcmDsplInternalDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The ECU internal data value.	
Template Description	
CompuScale.lowerLimit: This specifies the lower limit of the scale.	
CompuScale.upperLimit: This specifies the upper limit of a of the scale.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dcm_01000]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal
BSW Parameter	BSW Type
DcmDspRoutineParameterSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the size of a RoutineControl parameter in bytes	
Template Description	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutineSignalLength = maxNumberOfElements * 8	
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00838]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the endianness of the data belonging to a Routine Out Signal for RequestResult subfunction.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. byteOrder	
Mapping Rule	Mapping Type
baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticRequestRoutineResult.response	
	full





Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_01013]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. bitOffset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00837]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = BOOLEAN baseTypeSize = 1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the signal is sint16.

Template Description

BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize

Mapping Rule
Mapping Type

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest
RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 16

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT16_N

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint16 array.

Template Description

BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticDataElement.arraySizeSemantics:

This attribute controls the meaning of the value of the array size.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics

Mapping Rule
Mapping Type

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest
RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements
exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not
exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT32

ECUC-ENUMERATION-LITERAL-DEF





BSW Description	
Type of the signal is sint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 32	
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements:	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics:	
This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, Diagnostic Extract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequest RoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type





SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, UTF-32, UTF-32 baseTypeSize = 32 max NumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_ DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf.TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemantics Enum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID





valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspRequestRoutineResults/DcmDspRequestRoutineResultsOut/DcmDspRequestRoutineResultsOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize]. This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence. BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits. DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take. DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticRequest RoutineResults.response baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variableSize maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySizeSemantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine
BSW Parameter	BSW Type
DcmDspRoutineIdentifier	ECUC-INTEGER-PARAM-DEF
BSW Description	
2 bytes Identifier of the RID Within each DcmConfigSet all DcmDspRoutineIdentifier values shall be unique.	
Template Description	
DiagnosticRoutine.id: This is the numerical identifier used to identify the DiagnosticRoutine in the scope of diagnostic workflow DiagnosticRoutineNeeds.ridNumber: This represents a routine identifier for the diagnostic routine. This allows to predefined the RID number if the a function developer has received a particular requirement from the OEM or from a standardization body.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticRoutine.id, CommonStructure::ServiceNeeds::DiagnosticRoutineNeeds.ridNumber	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00641]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine	
BSW Parameter	BSW Type	
DcmDspRoutineUsePort	ECUC-BOOLEAN-PARAM-DEF	
BSW Description	<p>If this parameter is set to true, the DCM uses a port requiring a PortInterface RoutineServices_{RoutineName}.</p> <p>The R-Port is named RoutineServices_{RoutineName} where {RoutineName} is the name of the container DcmDspRoutine. In that case, the configuration must not provide function names in DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDspRequestResultsRoutineFnc. If this is false, the DCM expects to find the names of the functions to be used in DcmDspStartRoutineFnc, DcmDspStopRoutineFnc or DcmDspRequestResultsRoutineFnc.</p>	
Template Description	<p>This represents the ability to define a mapping of a diagnostic service to a software-component or a basic-software module. If the former is used then this kind of service mapping is applicable for the usage of ClientServerInterfaces.</p>	
M2 Parameter	<p>DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping</p>	
Mapping Rule	Mapping Type	
TRUE: DiagnosticServiceSwMapping is having a SwcServiceDependency FALSE: DiagnosticServiceSwMapping is having a BswServiceDependency	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00724]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine	
BSW Parameter	BSW Type	
DcmDspStartRoutine	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description	<p>Provides the configuration of Start subservice for RoutineControl service.</p>	
Template Description	<p>DiagnosticRoutine.start: This represents the ability to start a routine</p> <p>DiagnosticRoutineNeeds: Specifies the general needs on the configuration of the Diagnostic Communication Manager (Dcm) which are not related to a particular item (e.g. a PID). The main use case is the mapping of service ports to the Dcm which are not related to a particular item.</p>	
M2 Parameter	<p>DiagnosticExtract::CommonDiagnostics::DiagnosticRoutine.start, CommonStructure::ServiceNeeds::DiagnosticRoutineNeeds</p>	
Mapping Rule	Mapping Type	
A routine always comes with a start routine, independently of whether the execution is done synchronously or asynchronously.	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_01021]	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine
BSW Parameter	BSW Type
DcmDspStartRoutineFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name for request to application to start a routine. (Routine_Start-function)	
This parameter is related to the interface Xxx_Start.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00664]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine
BSW Parameter	BSW Type
DcmDspStartRoutineIn	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of input parameter of Start subservice for RoutineControl service	
Template Description	
This represents the request parameters.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticStartRoutine. request	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00834]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn
BSW Parameter	BSW Type
DcmDspStartRoutineInSignal	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of a routine signal used in RoutineControl service.	
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataInN elements in the XXX_Start function call.	
Template Description	
This represents the related dataElement of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement	
Mapping Rule	Mapping Type





1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00845]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).	
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.	
Template Description	
This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.	
Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuMethod	
Mapping Rule	Mapping Type
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The data value in the diagnosis representation.	
Template Description	
This represents a textual constant in the computation method.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuConstTextContent.vt	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping	
BSW Parameter	BSW Type	
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF	
BSW Description		
The ECU internal data value.		
Template Description		
CompuScale.lowerLimit: This specifies the lower limit of the scale.		
CompuScale.upperLimit: This specifies the upper limit of a of the scale.		
M2 Parameter		
AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_01000]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal	
BSW Parameter	BSW Type	
DcmDspRoutineParameterSize	ECUC-INTEGER-PARAM-DEF	
BSW Description		
Provide the size of a RoutineControl parameter in bytes		
Template Description		
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.		
M2 Parameter		
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements		
Mapping Rule	Mapping Type	
"Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutine.SignalLength = maxNumberOfElements * 8.	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dcm_00847]	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal	
BSW Parameter	BSW Type	
DcmDspRoutineSignalEndianness	ECUC-ENUMERATION-PARAM-DEF	
BSW Description		
Defines the endianness of the data belonging to a Routine In Signal for Start subfunction.		
Template Description		
This attribute specifies the byte order of the base type.		





M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder	
Mapping Rule	Mapping Type
baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticStartRoutine.request.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01016]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter.bitOffset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00846]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	
BaseTypeDirectDefinition.byteEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.byteSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStartRoutine.request byteEncoding = BOOLEAN byteSize = 1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either doesnot exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, UTF-32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixed Size (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID



△

valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineIn/DcmDspStartRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize]. This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence. BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits. DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size. DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.request baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variableSize maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySize Semantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine
BSW Parameter	BSW Type
DcmDspStartRoutineOut	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of output parameter of Start subservice for RoutineControl service.	
Template Description	
This represents the response parameters.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticStartRoutine.response	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00835]

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut			
BSW Parameter	BSW Type			
DcmDspStartRoutineOutSignal	ECUC-PARAM-CONF-CONTAINER-DEF			
BSW Description				
Provide description of a routine signal used in RoutineControl service.				
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataOutN elements in the XXX_Start function call.				
Template Description				
This represents the related dataElement of the DiagnosticParameter				
M2 Parameter				
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement				
Mapping Rule		Mapping Type		
1:1 mapping		full		
Mapping Status		ECUC Parameter ID		
valid		[ECUC_Dcm_00848]		

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType			
BSW Parameter	BSW Type			
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF			
BSW Description				
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).				
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.				
Template Description				
This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.				
Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.				
M2 Parameter				
AsamHdo::ComputationMethod:: CompuMethod				
Mapping Rule		Mapping Type		
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.		full		
Mapping Status		ECUC Parameter ID		
valid		[ECUC_Dcm_00999]		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping	
BSW Parameter	BSW Type	





DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The data value in the diagnosis representation.	
Template Description	
This represents a textual constant in the computation method.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuConstTextContent.vt	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
The ECU internal data value.	
Template Description	
CompuScale.lowerLimit: This specifies the lower limit of the scale.	
CompuScale.upperLimit: This specifies the upper limit of a of the scale.	
M2 Parameter	
AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dcm_01000]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal
BSW Parameter	BSW Type
DcmDspRoutineParameterSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the size of a RoutineControl parameter in bytes	
Template Description	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	
Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutineSignalLength = maxNumberOfElements * 8.	full





Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00850]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the endianness of the data belonging to a Routine Out Signal for Start subfunction.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder	
Mapping Rule	Mapping Type
baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticStartRoutine.response	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01017]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter.bitOffset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00867]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	




BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize

Mapping Rule
Mapping Type

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = BOOLEAN baseTypeSize = 1

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

FLOAT

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the data is float.

Template Description
BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.fixedLength

Mapping Rule
Mapping Type

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

FLOAT_N

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the data is float array.

Template Description



BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max
NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic
ValueNeeds.fixedLength=1 possible.

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT16

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint16.

Template Description
BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#)

Mapping Rule
Mapping Type

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart
Routine.response baseTypeEncoding = 2C baseTypeSize = 16

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT16_N

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint16 array.

Template Description



BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticDataElement.arraySizeSemantics:

This attribute controls the meaning of the value of the array size.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[arraySizeSemantics](#)

Mapping Rule

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT32

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint32.

Template Description
BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#)

Mapping Rule
Mapping Type

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = 2C baseTypeSize = 32

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT32_N

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint32 array.





Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	full
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	full
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = 2C baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the signal is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF





BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOf Elements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemanticseither does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type





UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStartRoutine.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStartRoutine.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixed Size (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStartRoutine/DcmDspStartRoutineOut/ DcmDspStartRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize].	
This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	





AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[arraySizeSemantics](#), DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.[maxNumberOfElements](#)

Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStart Routine.response baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variable Size maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySize Semantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine
BSW Parameter	BSW Type
DcmDspStopRoutine	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provides the configuration of Stop subservice for RoutineControl service. Existence indicates that the StopRoutine in the RoutineControl is supported.	
Template Description	
DiagnosticRoutine.stop: This represents the ability to stop a running routine.	
DiagnosticRoutineNeeds.diagRoutineType: This denotes the type of diagnostic routine which is implemented by the referenced server port.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticRoutine. stop , CommonStructure::ServiceNeeds::DiagnosticRoutineNeeds. diagRoutineType	
Mapping Rule	Mapping Type
1:1 mapping for DiagnosticRoutine.stop OR DiagnosticRoutineNeeds.diagRoutineType == asynchronous	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01022]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine
BSW Parameter	BSW Type
DcmDspStopRoutineFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name for request to application to stop a routine. (Routine_Stop-function)	
This parameter is related to the interface Xxx_Stop.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00752]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine
BSW Parameter	BSW Type
DcmDspStopRoutineIn	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of input parameter of Stop subservice for RoutineControl service.	
Template Description	
This represents the request parameters.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticStopRoutine. request	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00832]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn
BSW Parameter	BSW Type
DcmDspStopRoutineInSignal	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of a routine signal used in RoutineControl service.	
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataInN elements in the XXX_Stop function call.	
Template Description	
This represents the related dataElement of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00839]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).	
In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.	
Template Description	





This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.

Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.

M2 Parameter

AsamHdo::ComputationMethod::CompuMethod

Mapping Rule	Mapping Type
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping

BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF

BSW Description

The data value in the diagnosis representation.

Template Description

This represents a textual constant in the computation method.

M2 Parameter

AsamHdo::ComputationMethod::CompuConstTextContent.vt

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping

BSW Parameter	BSW Type
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF

BSW Description

The ECU internal data value.

Template Description
CompuScale.lowerLimit:

This specifies the lower limit of the scale.

CompuScale.upperLimit:

This specifies the upper limit of a of the scale.

M2 Parameter

AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dcm_01000]
-------	------------------

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal
BSW Parameter	BSW Type
DcmDspRoutineParameterSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the size of a RoutineControl parameter in bytes	
Template Description	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutineSignalLength = maxNumberOfElements * 8	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00841]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalEndianness	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the endianness of the data belonging to a Routine In Signal for Stop subfunction.	
Template Description	
This attribute specifies the byte order of the base type.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. byteOrder	
Mapping Rule	Mapping Type
baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticStopRoutine.request	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01014]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	





M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. bitOffset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00840]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = BOOLEAN baseTypeSize = 1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	Mapping Type
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, CommonStructure::ServiceNeeds::DiagnosticValueNeeds.fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from DiagnosticValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either doesnot exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 32	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either doesnot exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 8	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.request baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStopRoutine.request baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineIn/DcmDspStopRoutineInSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize].	
This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type





referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStopRoutine.request baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variableSize maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySize Semantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine
BSW Parameter	BSW Type
DcmDspStopRoutineOut	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of output parameter of Stop subservice for RoutineControl service.	
Template Description	
This represents the response parameters.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticStopRoutine. response	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00833]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut
BSW Parameter	BSW Type
DcmDspStopRoutineOutSignal	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Provide description of a routine signal used in RoutineControl service.	
The ordering defined via the index attribute of the subcontainers in this list represents the order of the dataOutN elements in the XXX_Stop function call.	
Template Description	
This represents the related dataElement of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. dataElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00842]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType
BSW Parameter	BSW Type
DcmDspTextTableMapping	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	





The purpose of the DcmDspTextTableMapping is to associate a texttable value defined in the context of the Dcm to a texttable value defined in the context of a CompuMethod referenced by a DataType that shall be taken to create a dataElement in a SenderReceiverInterface. By this means it is possible to create a primitive version of a TexttableMapping (which can only be applied if a dataElement already exists).

In other words, the DcmDspTextTableMapping provides a similar mechanism to the TexttableMapping in a situation where the TexttableMapping cannot be applied since the SenderReceiverInterface for the PortPrototype on the Dcm ServiceComponent does not yet exist.

Template Description

This meta-class represents the ability to express the relationship between a physical value and the mathematical representation.

Note that this is still independent of the technical implementation in data types. It only specifies the formula how the internal value corresponds to its physical pendant.

M2 Parameter

AsamHdo::ComputationMethod::CompuMethod

Mapping Rule	Mapping Type
This mapping applies if the CompuMethod.category is set to values TEXTTABLE or SCALE_LINEAR_AND_TEXTTABLE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00999]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspDiagnosisRepresentationDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	The data value in the diagnosis representation.
Template Description	This represents a textual constant in the computation method.
M2 Parameter	
AsamHdo::ComputationMethod::CompuConstTextContent.vt	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01001]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspArgumentScaling/DcmDspAlternativeDataType/DcmDspTextTableMapping
BSW Parameter	BSW Type
DcmDspInternalDataValue	ECUC-INTEGER-PARAM-DEF
BSW Description	The ECU internal data value.
Template Description	




CompuScale.lowerLimit:

This specifies the lower limit of the scale.

CompuScale.upperLimit:

This specifies the upper limit of a of the scale.

M2 Parameter

AsamHdo::ComputationMethod::CompuScale.lowerLimit, AsamHdo::ComputationMethod::CompuScale.upperLimit

Mapping Rule

1:1 mapping

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_01000]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal

BSW Parameter

DcmDspRoutineParameterSize

BSW Type

ECUC-INTEGER-PARAM-DEF

BSW Description

Provide the size of a RoutineControl parameter in bytes

Template Description

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

M2 Parameter

DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements

Mapping Rule

"Only in case of variable length required (according to constr_6008). Calculation: DcmDspRoutineSignalLength = maxNumberOfElements * 8

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_00844]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal

BSW Parameter

DcmDspRoutineSignalEndianness

BSW Type

ECUC-ENUMERATION-PARAM-DEF

BSW Description

Defines the endianness of the data belonging to a Routine Out Signal for Stop subfunction.

Template Description

This attribute specifies the byte order of the base type.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.byteOrder

Mapping Rule

baseType.baseTypeDefinition.byteOrder referenced by swDataDefProps of the Diagnostic Parameter with the role DiagnosticStopRoutine.response

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dcm_01015]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal
BSW Parameter	BSW Type
DcmDspRoutineSignalPos	ECUC-INTEGER-PARAM-DEF
BSW Description	
Provide the position of the signal in the RoutineControl request/response. The position is defined in bits.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter. bitOffset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00843]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
BOOLEAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is boolean.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = BOOLEAN baseTypeSize = 1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	




BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max
NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic
ValueNeeds.fixedLength=1 possible.

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

FLOAT_N

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the data is float array.

Template Description
BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticValueNeeds.fixedLength:

This attribute controls whether the data length of the data is fixed.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeEncoding](#), AsamHdo::BaseTypes::BaseTypeDirectDefinition.[baseTypeSize](#), CommonStructure::ServiceNeeds::DiagnosticValueNeeds.[fixedLength](#)

Mapping Rule
Mapping Type

baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max
NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic
ValueNeeds.fixedLength=1 possible.

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter
BSW Type

SINT16

ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint16.

Template Description



BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize

Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType	
BSW Parameter	BSW Type	
SINT16_N	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	Type of the signal is sint16 array.	
Template Description	BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize:	Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements:	The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics:	DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics	
Mapping Rule	Mapping Type	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Type of the signal is sint32.





Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 32	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is sint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
SINT8	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Type of the signal is sint8.

Template Description

BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize

Mapping Rule **Mapping Type**

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 8

Mapping Status

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType

BSW Parameter **BSW Type**

SINT8_N ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Type of the signal is sint8 array.

Template Description

BaseTypeDirectDefinition.baseTypeEncoding:

This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.

BaseTypeDirectDefinition.baseTypeSize:

Describes the length of the data type specified in the container in bits.

DiagnosticDataElement.maxNumberOfElements:

The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.

DiagnosticDataElement.arraySizeSemantics:

This attribute controls the meaning of the value of the array size.

M2 Parameter

AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics

Mapping Rule **Mapping Type**

referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = 2C baseTypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either doesnot exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)

Mapping Status

valid

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16	ECUC-ENUMERATION-LITERAL-DEF





BSW Description	
Type of the signal is uint16.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT16_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint16 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , Diagnostic Extract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, UTF-16 baseTypeSize = 16 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type





UINT32	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32	full
Mapping Status	
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
UINT32_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint32 array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, UTF-32 baseTypeSize = 32 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixedSize (cf. TPS_DEXT_01001)	full
Mapping Status	
valid	

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType			
BSW Parameter	BSW Type			
UINT8	ECUC-ENUMERATION-LITERAL-DEF			
BSW Description				
Type of the signal is uint8.				
Template Description				
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.				
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.				
M2 Parameter				
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize				
Mapping Rule	Mapping Type			
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8	full			
Mapping Status	ECUC Parameter ID			
valid				

BSW Module	BSW Context			
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType			
BSW Parameter	BSW Type			
UINT8_N	ECUC-ENUMERATION-LITERAL-DEF			
BSW Description				
Type of the signal is uint8 array.				
Template Description				
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.				
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.				
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.				
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.				
M2 Parameter				
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. arraySizeSemantics , DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements				
Mapping Rule	Mapping Type			
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP base TypeSize = 8 maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01001) arraySizeSemantics either does not exist or exists and is set to ArraySizeSemanticsEnum.fixed Size (cf. TPS_DEXT_01001)	full			
Mapping Status	ECUC Parameter ID			



△

valid	
-------	--

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspRoutine/DcmDspStopRoutine/DcmDspStopRoutineOut/ DcmDspStopRoutineOutSignal/DcmDspRoutineSignalType
BSW Parameter	BSW Type
VARIABLE_LENGTH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the signal is uint8[DcmDspRoutineParameterSize]. This is only valid for the last signal and when DcmDspRoutineSignalType is set to VARIABLE_LENGTH.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticDataElement.maxNumberOfElements: The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
DiagnosticDataElement.arraySizeSemantics: This attribute controls the meaning of the value of the array size.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeEncoding, AsamHdo::BaseTypes::BaseTypeDirectDefinition.baseTypeSize, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.maxNumberOfElements, DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement.arraySizeSemantics	
Mapping Rule	Mapping Type
referenced by swDataDefProps of the DiagnosticParameter with the role DiagnosticStop Routine.response baseTypeEncoding = NONE baseTypeSize = 8 arraySizeSemantics = variable Size maxNumberOfElements exists and value is greater than 0 (cf. TPS_DEXT_01002) arraySize Semantics exists and is set to ArraySizeSemanticsEnum.variableSize (cf. TPS_DEXT_01002)	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityADRSIZE	ECUC-INTEGER-PARAM-DEF
BSW Description	
Size in bytes of the AccessDataRecord used in GetSeed	
Template Description	
This represents the size of the AccessDataRecord used in GetSeed. Unit:byte.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSecurityLevel.accessDataRecordSize	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00725]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityAttemptCounterEnabled	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
This configuration parameter controls the existence of the APIs to set / get the attempt counter values towards application (Xxx_SetSecurityAttemptCounter() / Xxx_GetSecurityAttemptCounter()). In case of enabled, the security attempt counter values are passed to application, whenever there is a change in the value. This allows storing the values in nonvolatile RAM and restoring them at ECU startup.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01050]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityCompareKeyFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request the result of a key comparison.	
Parameter is only relevant if DcmDspSecurityUsePort=="USE_ASYNCH_FNC". This parameter is related to the interface Xxx_CompareKey.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping.mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00969]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityDelayTime	ECUC-FLOAT-PARAM-DEF
BSW Description	
Delay time after failed security access in seconds.	
This is started after DcmDspSecurityNumAttDelay number of failed security accesses.	
min: A negative value is not allowed.	
Template Description	





This represents the delay time after a failed security access. Unit: second.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticSecurityLevel.[securityDelayTime](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00757]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityDelayTimeOnBoot	ECUC-FLOAT-PARAM-DEF
BSW Description	
Value of the delay timer in case of 'power on' in seconds. This delay indicates the time at ECU boot power-on time during which the Dcm does not accept a security access.	
min: A negative value is not allowed.	
Template Description	
Start delay timer on power on in seconds.	
This delay indicates the time at ECU boot power-on time where the Dcm remains in the default session and does not accept a security access.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. securityDelayTimeOnBoot	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00726]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityGetAttemptCounterFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to request the value of an attempt counter. This parameter is related to the interface Xxx_GetSecurityAttempt Counter.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01048]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityGetSeedFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Callout function name used to request a seed. This parameter is related to the interface Xxx_GetSeed.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00968]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityKeySize	ECUC-INTEGER-PARAM-DEF
BSW Description	
size of the security key (in Bytes).	
Template Description	
This represents the size of the security key. Unit: byte.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSecurityLevel. keySize	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00760]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityLevel	ECUC-INTEGER-PARAM-DEF
BSW Description	
Value of Security level. The locked state cannot be configured explicitly.	
1,2,3...63: configuration dependent - Conversion formula to calculate SecurityLevel out of tester requested	
SecurityAccessType parameter: SecurityLevel = (SecurityAccessType (requestSeed) + 1) / 2	
Type: Dcm_SecLevelType	
Template Description	
This would be 0x01, 0x03, 0x05, ...	
The sendKey id can be computed by adding 1 to the requestSeedId	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::SecurityAccess::DiagnosticSecurityAccess. requestSeedId	





Mapping Rule		Mapping Type
DcmDspSecurityLevel=(requestSeedId+1)/2		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dcm_00754]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecurityNumAttDelay	ECUC-INTEGER-PARAM-DEF
BSW Description	
Number of failed security accesses after which the delay time is activated	
Template Description	
This represents the number of failed security accesses after which the delay time is activated.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSecurityLevel.numFailedSecurityAccess	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00762]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecuritySeedSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
size of the security seed (in Bytes).	
Template Description	
This represents the size of the security seed. Unit: byte.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSecurityLevel.seedSize	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00755]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow
BSW Parameter	BSW Type
DcmDspSecuritySetAttemptCounterFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name to set the value of an attempt counter. This parameter is related to the interface Xxx_SetSecurityAttempt Counter.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	





M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01049]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow/DcmDspSecurityUsePort
BSW Parameter	BSW Type
USE_ASYNCH_CLIENT_SERVER	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The DCM will access the data using an R-Port requiring a asynchronous ClientServerInterface SecurityAccess_{Security Level}.	
The R-Port is described in DcmDspSecurityRow description.	
Template Description	
This represents the ability to point into the component hierarchy (under possible consideration of the rootSoftware Composition)	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedSwcServiceDependencyInSystem	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSecurity/DcmDspSecurityRow/DcmDspSecurityUsePort
BSW Parameter	BSW Type
USE_ASYNCH_FNC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The DCM will access the data using the functions that are defined in the parameters DcmDspSecurityGetSeedFnc and DcmDspSecurityCompareKeyFnc as well as the functions defined in DcmDspSecurityGetAttemptCounterFnc and DcmDspSecuritySetAttemptCounterFnc, if enabled by the parameter DcmDspSecurityAttemptCounterEnabled.	
DCM_E_PENDING return is allowed and OpStatus is existing as IN parameter.	
Template Description	
This is supposed to represent a reference to a BswServiceDependency, the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow/DcmDspSessionForBoot
BSW Parameter	BSW Type
DCM_NO_BOOT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
This diagnostic session doesn't allow to jump to Bootloader.	
Template Description	
This diagnostic session doesn't allow to jump to Bootloader.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticJumpToBootLoaderEnum.noBoot	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow/DcmDspSessionForBoot
BSW Parameter	BSW Type
DCM_OEM_BOOT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
This diagnostic session allows to jump to OEM Bootloader and bootloader sends final response.	
Template Description	
This diagnostic session allows to jump to OEM Bootloader. In this case the bootloader send the final response.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticJumpToBootLoaderEnum.oemBoot	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow/DcmDspSessionForBoot
BSW Parameter	BSW Type
DCM_OEM_BOOT_RESPAPP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
This diagnostic session allows to jump to OEM Bootloader and application sends final response.	
Template Description	
This diagnostic session allows to jump to OEM Bootloader and application sends final response.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticJumpToBootLoaderEnum.oemBootRespApp	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow/DcmDspSessionForBoot
BSW Parameter	BSW Type
DCM_SYS_BOOT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
This diagnostic session allows to jump to System Supplier Bootloader and bootloader sends final response.	
Template Description	
This diagnostic session allows to jump to System Supplier Bootloader. In this case the bootloader send the final response.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticJumpToBootLoaderEnum.systemSupplierBoot	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow/DcmDspSessionForBoot
BSW Parameter	BSW Type
DCM_SYS_BOOT_RESPAPP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
This diagnostic session allows to jump to System Supplier Bootloader and application sends final response.	
Template Description	
This diagnostic session allows to jump to System Supplier Bootloader and application sends final response.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticJumpToBootLoaderEnum.systemSupplierBootRespApp	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow
BSW Parameter	BSW Type
DcmDspSessionLevel	ECUC-INTEGER-PARAM-DEF
BSW Description	
subFunction value of the DiagnosticSession. 0, 127 and all values above 127 are reserved by ISO	
Template Description	
This is the numerical identifier used to identify the DiagnosticSession in the scope of diagnostic workflow	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSession.id	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00765]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow
BSW Parameter	BSW Type
DcmDspSessionP2ServerMax	ECUC-FLOAT-PARAM-DEF
BSW Description	
This is the session value for P2ServerMax in seconds (per Session). The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds. DCM configuration tools must convert this float value to the appropriate value format for the use in the software implementation of DCM. This value is reported to the tester within the response to the 'Session Control' service.	
Template Description	
This is the session value for P2ServerMax in seconds (per Session Control).	
The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSession. p2ServerMax	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00766]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspSession/DcmDspSessionRow
BSW Parameter	BSW Type
DcmDspSessionP2StarServerMax	ECUC-FLOAT-PARAM-DEF
BSW Description	
This is the session value for P2*ServerMax in seconds (per Session). The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds. DCM configuration tools must convert this float value to the appropriate value format for the use in the software implementation of DCM. This value is reported to the tester within the response to the 'Session Control' service.	
Template Description	
This is the session value for P2*ServerMax in seconds (per Session Control).	
The AUTOSAR configuration standard is to use SI units, so this parameter is defined as a float value in seconds.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticSession. p2StarServerMax	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00768]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp
BSW Parameter	BSW Type
DcmDspVehInfo	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for one single VehicleInfoType of service \$09	
Template Description	
This meta-class represents the ability to model an instance of the OBD mode 0x09 service.	





M2 Parameter	
DiagnosticExtract::Dcm::ObdService::Mode_0x09_RequestVehicleInformation::DiagnosticRequestVehicleInfo	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00630]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo
BSW Parameter	BSW Type
DcmDspVehInfoData	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Data Item of an InfoType; ShortName is post-fix of the port interface name.	
Template Description	
This meta-class represents the ability to describe a concrete piece of data to be taken into account for diagnostic purposes.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement	
Mapping Rule	Mapping Type
The value shall be taken from DiagnosticRequestVehicleInfo.infoType.dataElement.dataElement.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00888]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo/DcmDspVehInfoData
BSW Parameter	BSW Type
DcmDspVehInfoDataOrder	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the order of the data item in the InfoType; values: 0..255; first data item having the order number 0; the next 1 and so on. The configuration of order needs to be unique per InfoType.	
Template Description	
This represents the bitOffset of the DiagnosticParameter	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticParameter.bitOffset	
Mapping Rule	Mapping Type
Value shall be taken from DiagnosticRequestVehicleInfo.infoType.dataElement.bitOffset.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00891]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo/DcmDspVehInfoData
BSW Parameter	BSW Type
DcmDspVehInfoDataReadFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Callout function name for reading InfoType data item. Only required in case parameter 'DcmDspVehInfoDataUsePort' is set to 'false'	





Template Description	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency	
Mapping Rule	
The BswServiceDependency should have aRoleBasedBswModuleEntryAssignment that in turn has attribute role set to Xxx_GetInfotypeValueData and points to a BswModuleEntry.	full
Mapping Status	
valid	[ECUC_Dcm_00889]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo/DcmDspVehInfoData
BSW Parameter	BSW Type
DcmDspVehInfoDataSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Size in bytes of the InfoType data item.	
Template Description	
The existence of this attribute turns the data instance into an array of data. The attribute determines the size of the array in terms of how many elements the array can take.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics::DiagnosticDataElement. maxNumberOfElements	
Mapping Rule	
Value shall be taken from DiagnosticRequestVehicleInfo.infoType.dataElement.dataElement.maxNumberOfElements.	full
Mapping Status	
valid	[ECUC_Dcm_00890]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo/DcmDspVehInfoData
BSW Parameter	BSW Type
DcmDspVehInfoDataUsePort	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
When this parameter is set to true the DCM will access the Data using an R-Port requiring a PortInterface IInfotype Services_{VehInfoData}. The R-Port is named InfotypeServices_{VehInfoData} where {VEHINFODATA} is the name of the container DcmDspVehInfoData. In that case, the DcmDspVehInfoDataReadFnc is ignored and the RTE APIs are used.	
When this parameter is set to false, the DCM calls the function defined in DcmDspVehInfoDataReadFnc.	
Template Description	
DiagnosticServiceSwMapping.mappedBswServiceDependency:	
This is supposed to represent a reference to a BswServiceDependency. the latter is not derived from Referrable and therefore this detour needs to be implemented to still let BswServiceDependency become the target of a reference.	
DiagnosticServiceSwMapping.mappedSwcServiceDependencyInSystem:	
This represents the ability to point into the component hierarchy (under possible consideration of the rootSoftware Composition)	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceSwMapping. mappedBswServiceDependency , Diagnostic Extract::ServiceMapping::DiagnosticServiceSwMapping. mappedSwcServiceDependencyInSystem	
Mapping Rule	





Shall be set to TRUE if the reference DiagnosticServiceSwMapping.mappedSwcService Dependency exists. Shall be set to FALSE if the reference DiagnosticServiceSwMapping.mapped BswServiceDependency exists.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00727]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmDsp/DcmDspVehInfo
BSW Parameter	BSW Type
DcmDspVehInfoInfoType	ECUC-INTEGER-PARAM-DEF
BSW Description	<p>value of InfoType.</p> <p>Within each DcmConfigSet all DcmDspVehInfoInfoType values shall be unique.</p>
Template Description	
ObdInfoServiceNeeds.infoType:	The InfoType according to ISO 15031-5
DiagnosticInfoType.id:	This attribute represents the value of InfoType (see SAE J1979-DA).
M2 Parameter	
CommonStructure::ServiceNeeds::ObdInfoServiceNeeds.infoType, DiagnosticExtract::CommonDiagnostics::DiagnosticInfoType.id	
Mapping Rule	Mapping Type
If DiagnosticRequestVehicleInfo, us DiagnosticRequestVehicleInfo.infoType.id.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00631]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions
BSW Parameter	BSW Type
DcmModeCondition	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	<p>This container contains the configuration of a mode condition or an environmental conditions which can be used as argument in DcmModeRules.</p> <p>One DcmModeCondition shall contain either one DcmSwcModeRef or one DcmBswModeRef or one DcmSwcSRDataElementRef.</p> <p>Please note that the Dcm acts as well as mode manager. Therefore the references DcmSwcModeRef or one DcmBswModeRef might point to provided ModeDeclarationGroupPrototypes of the Dcm itself as well as to provided ModeDeclarationGroupPrototypes of other Bsw Modules or software components.</p> <p>In case of a configured DcmSwcModeRef or DcmBswModeRef only the DcmConditionType DCM_EQUALS or DCM_EQUALS_NOT are applicable.</p> <p>In case of DcmSwcSRDataElementRef all literals of DcmConditionType are possible.</p>
Template Description	
DiagnosticCompareConditions are atomic conditions. They are based on the idea of a comparison at runtime of some variable data with something constant. The type of the comparison (==, !=, <, <=, ...) is specified in DiagnosticCompareCondition.compareType.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvCompareCondition	
Mapping Rule	Mapping Type





Depending on the reference a DcmModeCondition is mapped to a DiagnosticEnvModeCondition if only one reference is present and reference is a DcmSwcModeRef or a DcmBswModeRef. If two references are present, a DcmSwcSRDataElementRef and a DcmSwcSRDataElementValueRef, then DcmModeCondition is mapped to a DiagnosticEnvDataCondition.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00928]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition
BSW Parameter	BSW Type
DcmBswModeRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	
This parameter references a mode of a ModeDeclarationGroupPrototype provided by a Basic Software Module used for the condition.	
Please note that such ModeDeclarationGroupPrototype are owned by a Basic Software Module Description in the role providedModeGroup.	
Template Description	
This reference represents both the ModeDeclarationGroupPrototype and the ModeDeclaration relevant for the mode comparison.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvModeCondition.modeElement	
Mapping Rule	Mapping Type
For DcmModeRef a new DiagnosticEnvBswModeElement is used, pointing to the ModeDeclaration via ModelInModuleDescriptionInstanceRef. This new DiagnosticEnvModeElement shall be aggregated by the same DiagnosticEnvironmentalConfition as the DiagnosticEnvModeCondition, in which the target of the reference DiagnosticEnvModeCondition.modeElement points to the this DiagnosticEnvModeElement.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00931]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType
BSW Parameter	BSW Type
DCM_EQUALS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum isEqual: equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula.op, Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum.isEqual	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType	
BSW Parameter	BSW Type	
DCM_EQUALS_NOT	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.		
DiagnosticCompareTypeEnum.isNotEqual: not equal		
M2 Parameter		
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isNotEqual		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType	
BSW Parameter	BSW Type	
DCM_GREATER_OR_EQUAL	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.		
DiagnosticCompareTypeEnum.isGreaterOrEqual: greater than or equal		
M2 Parameter		
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isGreaterOrEqual		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType	
BSW Parameter	BSW Type	
DCM_GREATER_THAN	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.		
DiagnosticCompareTypeEnum.isGreaterThan: greater than		





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isGreaterThan	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType
BSW Parameter	BSW Type
DCM_LESS_OR_EQUAL	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isLessOrEqual: less than or equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isLessOrEqual	
Mapping Rule	Mapping Type
	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmConditionType
BSW Parameter	BSW Type
DCM_LESS_THAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isLessThan: less than	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isLessThan	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmSwcDataElementValue/ DcmSwcDataElementArray/DcmSwcDataElementArrayElement
BSW Parameter	BSW Type
DcmSwcDataElementArrayElementIndex	ECUC-INTEGER-PARAM-DEF
BSW Description	
Index to an element of the compare value array.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is an array.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01127]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmSwcDataElementValue/ DcmSwcDataElementArray/DcmSwcDataElementArrayElement
BSW Parameter	BSW Type
DcmSwcDataElementArrayElementValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Value of an array element compare value.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is an array.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_01128]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition/DcmSwcDataElementValue/ DcmSwcDataElementPrimitive
BSW Parameter	BSW Type
DcmSwcDataElementPrimitiveValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Primitive compare value.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is primitive.	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dcm_01126]
-------	------------------

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition
BSW Parameter	BSW Type
DcmSwcModeRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	This parameter references a mode in a particular mode request port of a software component that is used for the condition.
Template Description	This reference represents both the ModeDeclarationGroupPrototype and the ModeDeclaration relevant for the mode comparison.
M2 Parameter	DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvModeCondition. modeElement
Mapping Rule	Mapping Type
For DcmModeRef a new DiagnosticEnvSwcModeElement is used, pointing to the ModeDeclaration via PModelInSystemInstanceRef. This new DiagnosticEnvModeElement shall be aggregated by the same DiagnosticEnvironmentalCondition as the DiagnosticEnvModeCondition, in which the target of the reference DiagnosticEnvModeCondition.modeElement points to the this DiagnosticEnvMode Element.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00930]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeCondition
BSW Parameter	BSW Type
DcmSwcSRDataElementRef	ECUC-CHOICE-REFERENCE-DEF
BSW Description	Reference to environmental conditions. It is possible to reference a S/R Receiver-Port to read physical values and compare (equal, greater, less,...) them with a configured value that is defined by DcmSwcDataElementValue.
Template Description	This reference represents the related diagnostic data element.
M2 Parameter	DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. dataElement
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_001037]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions
BSW Parameter	BSW Type
DcmModeRule	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	This container contains the configuration of a mode rule which represents a logical expression with DcmModeConditions or other DcmModeRules as arguments. All arguments are processed with the operator defined by DcmLogicalOperator, for instance: Argument_A AND Argument_B AND Argument_C





Template Description	
<p>A DiagnosticEnvConditionFormula embodies the computation instruction that is to be evaluated at runtime to determine if the DiagnosticEnvironmentalCondition is currently present (i.e. the formula is evaluated to true) or not (otherwise). The formula itself consists of parts which are combined by the logical operations specified by DiagnosticEnvConditionFormula.op.</p> <p>If a diagnostic functionality cannot be executed because an environmental condition fails then the diagnostic stack shall send a negative response code (NRC) back to the client. The value of the NRC is directly related to the specific formula and is therefore formalized in the attribute DiagnosticEnvConditionFormula.nrcValue.</p>	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula	
Mapping Rule	Mapping Type
A DcmModeRule is mapped to a DiagnosticEnvConditionFormula, if this DcmModeRule is a subrule, i.e. it is referenced by a DcmArgumentRef. In addition, a new DiagnosticEnvironmental Condition shall be created with DiagnosticEnvironmentalCondition.formula containing a Diagnostic EnvConditionFormula. In both cases, if no DcmLogicalOperator is present in this DcmModeRule, then DiagnosticEnvConditionFormula shall be set to DiagnosticLogicalOperatorEnum.logicalAnd.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00925]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeRule
BSW Parameter	BSW Type
DcmArgumentRef	ECUC-CHOICE-REFERENCE-DEF
BSW Description	
This is a choice reference either to a mode condition or a an other mode rule serving as sub-expression.	
Template Description	
A DiagnosticEnvConditionFormulaPart can either be a atomic condition, e.g. a DiagnosticEnvCompareCondition, or a DiagnosticEnvConditionFormula, again, which allows arbitrary nesting.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormulaPart	
Mapping Rule	Mapping Type
Depending on the destination, one DcmArgumentRef is mapped to a DiagnosticEnvCondition Formula if "destination" is a DcmModeRule, and to a DiagnosticEnvCompareCondition, if "destination" is a DcmModeCondition. The order of the aggregation of the DiagnosticEnvCondition FormulaParts shall correspond to the ordering of the index of the DcmArgumentRefs.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00927]

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeRule/DcmLogicalOperator
BSW Parameter	BSW Type
DCM_AND	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticLogicalOperatorEnum.logicalAnd: Logical AND	
M2 Parameter	





DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula.[op](#), DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticLogicalOperatorEnum.[logicalAnd](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeRule/DcmLogicalOperator
BSW Parameter	BSW Type
DCM_OR	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticLogicalOperatorEnum.logicalOr: Logical OR	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticLogicalOperatorEnum. logicalOr	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dcm	Dcm/DcmConfigSet/DcmProcessingConditions/DcmModeRule
BSW Parameter	BSW Type
DcmModeRuleNrcValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Optional parameter which defines the NRC to be sent in case the mode rule condition is not valid.	
Template Description	
This attribute represents the concrete NRC value that shall be returned if the condition fails.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. nrcValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00949]

BSW Module	BSW Context
Dcm	Dcm/DcmGeneral
BSW Parameter	BSW Type
DcmDD DIDStorage	ECUC-BOOLEAN-PARAM-DEF
BSW Description	





This configuration switch defines, whether DDDID definition is stored non-volatile or not.

true: DDDID are stored non-volatile false: DDDID are only maintained volatile

Template Description

This configuration switch defines whether DDDID definition is handled as non-volatile information or not.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::DynamicallyDefineDataIdentifier::DiagnosticDynamicallyDefineDataIdentifier Class.[configurationHandling](#)

Mapping Rule	Mapping Type
volatile -> false, nonVolatile -> true	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00971]

BSW Module	BSW Context
Dcm	Dcm/DcmGeneral
BSW Parameter	BSW Type
DcmRespondAllRequest	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
If set to FALSE the Dcm will not respond to diagnostic request that contains a service ID which is in the range from 0x40 to 0x7F or in the range from 0xC0 to 0xFF (Response IDs).	
Template Description	
If set to FALSE the DCM will not respond to diagnostic request that contains a service ID which is in the range from 0x40 to 0x7F or in the range from 0xC0 to 0xFF (Response IDs).	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. responseOnAllRequestSids	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00600]

BSW Module	BSW Context
Dcm	Dcm/DcmGeneral
BSW Parameter	BSW Type
DcmVinRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to the Did containing the VIN Information.	
This parameter is needed for function Dcm_GetVin	
Template Description	
This meta-class represents the ability to model a diagnostic data identifier (DID) that is fully specified regarding the payload at configuration-time.	
M2 Parameter	
DiagnosticExtract::CommonDiagnostics:: DiagnosticDataIdentifier	
Mapping Rule	Mapping Type
This reference shall only apply to a DiagnosticDataIdentifier where the attribute representsVin is set to true.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dcm_00984]

E.3 Dem

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTC
BSW Parameter	BSW Type
DemDTCFunctionalUnit	ECUC-INTEGER-PARAM-DEF
BSW Description	
DTCFunctionalUnit is a 1-byte value which identifies the corresponding basic vehicle / system function which reports the DTC. This parameter is necessary for the report of severity information.	
If this parameter is configured for no DTC, the Dem provides no DTC functional unit information.	
Template Description	
This attribute specifies a 1-byte value which identifies the corresponding basic vehicle / system function which reports the DTC. This parameter is necessary for the report of severity information.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeUds. functionalUnit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00643]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTC
BSW Parameter	BSW Type
DemDTCSeverity	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
DTC severity according to ISO 14229-1. This parameter depends on the automotive manufacturer.	
If it is not configured, the value is counted as 'no severity'. If this parameter is configured for no DTC, the Dem provides no DTC severity information.	
Template Description	
DTC severity according to ISO 14229-1.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeUds. severity	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00645]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTC
BSW Parameter	BSW Type
DemWWHOBDDTCClass	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
DTC Class according to ISO 14229-1 [2013 version]. This parameter depends on the automotive manufacturer. If it is not configured, the value is marked as 'unclassified'. If this parameter is configured for no DTC, the Dem provides no DTC WWHOBD class information.	
Template Description	
This attribute is used to identify (if applicable) the corresponding severity class of an WWH-OBD DTC.	





M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeUds. wwhObdDtcClass	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00912]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemAgingAllowed	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Defines if a DTC can be aged. TRUE: aging allowed FALSE: aging not allowed	
Template Description	
Reference to an aging algorithm in case that an aging/unlearning of the event is allowed.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. aging	
Mapping Rule	Mapping Type
Shall be set to true if DiagnosticTroubleCodeProps.aging exists. Shall be set to false if Diagnostic TroubleCodeProps.aging does not exist.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00622]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemAgingCycleCounterThreshold	ECUC-INTEGER-PARAM-DEF
BSW Description	
Number of aging cycles needed to unlearn/delete the event.	
Template Description	
Number of aging cycles needed to unlearn/delete the event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticAging::DiagnosticAging. threshold	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00623]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemAgingCycleRef	ECUC-REFERENCE-DEF
BSW Description	





Reference to the cycle which is triggering the aging of the event.

Template Description

This represents the applicable aging cycle.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticAging::DiagnosticAging.[agingCycle](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00624]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemDTCPriority	ECUC-INTEGER-PARAM-DEF
BSW Description	
Priority of the event/dtc, in view of full event memory. A lower value means higher priority.	
Template Description	
Priority of the event, in view of full event buffer. A lower value means higher priority.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. priority	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00662]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemDTCSignificance	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Significance of the event, which indicates additional information concerning fault classification and resolution.	
It can be mapped as Dem-internal data element. It shall be configured, if it is a part of event related data.	
Template Description	
Significance of the event, which indicates additional information concerning fault classification and resolution.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. significance	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00779]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes/DemDTCSignificance
BSW Parameter	BSW Type





DEM_EVENT_SIGNIFICANCE_OCCURRENCE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
issue, which indicates additional information concerning insufficient system behavior	
Template Description	
Issue, which indicates additional information concerning insufficient system behavior.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticSignificanceEnum. occurrence	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemMaxNumberFreezeFrameRecords	ECUC-INTEGER-PARAM-DEF
BSW Description	
This parameter defines the number of according freeze frame records, which can maximal be stored for this event. Therefore all these freeze frame records have the same freeze frame class.	
This parameter is only required for calculated record numeration (refer to DemTypeOfFreezeFrameRecordNumeration).	
Template Description	
This attribute defines the number of according freeze frame records, which can maximal be stored for this event. Therefore all these freeze frame records have the same freeze frame class.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. maxNumberFreezeFrameRecords	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00605]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDTCAttributes
BSW Parameter	BSW Type
DemMemoryDestinationRef	ECUC-CHOICE-REFERENCE-DEF
BSW Description	
The memory destination assigns DTCs to one or two memory destinations. If more than one memory destination is assigned to a specific DTC, the DTC can be present in the corresponding event memories. In this case one of the references has to be DemMirrorMemory (SWS_Dem_CONSTR_6104).	
Template Description	
The event destination assigns events to none, one or multiple origins.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. memoryDestination	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00890]

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass	
BSW Parameter	BSW Type	
DemCounterBasedFdcThresholdStorageValue	ECUC-INTEGER-PARAM-DEF	
BSW Description		
Threshold to allocate an event memory entry and to capture the Freeze Frame.		
Template Description		
Threshold to allocate an event memory entry and to capture the Freeze Frame.		
M2 Parameter		
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterBasedFdcThresholdStorageValue		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00914]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass	
BSW Parameter	BSW Type	
DemDebounceBehavior	ECUC-ENUMERATION-PARAM-DEF	
BSW Description		
This parameter defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled.		
Template Description		
This attribute defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled.		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceAlgorithmProps. debounceBehavior		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00786]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass/DemDebounceBehavior	
BSW Parameter	BSW Type	
DEM_DEBOUNCE_FREEZE	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
The event debounce counter will be frozen with the current value and will not change while a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. After all related enable conditions are fulfilled and Control DTCSetting of the related event is enabled again, the event qualification will continue with the next report of the event (i.e. Set EventStatus).		
Template Description		
The event debounce counter will be frozen with the current value and will not change while a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. After all related enable conditions are fulfilled and Control DTCSetting of the related event is enabled again, the event qualification will continue with the next report of the event (i.e. Set EventStatus).		
M2 Parameter		




 DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceBehaviorEnum.[freeze](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass/DemDebounceBehavior
BSW Parameter	BSW Type
DEM_DEBOUNCE_RESET	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	

The event debounce counter will be reset to initial value if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. The qualification of the event will be restarted with the next valid event report.

Template Description

The event debounce counter will be reset to initial value if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. The qualification of the event will be restarted with the next valid event report.

M2 Parameter

 DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceBehaviorEnum.[reset](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterDecrementStepSize	ECUC-INTEGER-PARAM-DEF
BSW Description	

Defines the step size for decrementation of the internal debounce counter (PREPASSED).

Template Description

This value shall be taken to decrement the internal debounce counter.

M2 Parameter

 CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased.[counterDecrementStepSize](#)

Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterDecrementStepSize. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00635]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterFailedThreshold	ECUC-INTEGER-PARAM-DEF
BSW Description	





Defines the value of the internal debounce counter, which indicates the failed status.	
Template Description	
This value defines the event-specific limit that indicates the "failed" counter status.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterFailedThreshold	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterFailedThreshold. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00618]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterIncrementStepSize	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the step size for incrementation of the internal debounce counter (PREFAILED).	
Template Description	
This value shall be taken to increment the internal debounce counter.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterIncrementStepSize	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterIncrementStepSize. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00637]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterJumpDown	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Switch for the activation of Jump-Down. true: Jump-Down activated false: Jump-Down deactivated	
Template Description	
This value activates or deactivates the counter jump-down behavior.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterJumpDown	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterJumpDown. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full





Mapping Status		ECUC Parameter ID
valid		[ECUC_Dem_00685]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterJumpDownValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Jump-Down value of the internal debounce counter which is taken as initialization value for the counter when the respective step-down occurs.	
Template Description	
This value represents the initial value of the internal debounce counter if the counting direction changes from incrementing to decrementing.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterJumpDownValue	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterJumpDownValue. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEvent DebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00638]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterJumpUp	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Switch for the activation of Jump-Up. true: Jump-Up activated false: Jump-Up deactivated	
Template Description	
This value activates or deactivates the counter jump-up behavior.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterJumpUp	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterJumpUp. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEvent DebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00686]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterJumpUpValue	ECUC-INTEGER-PARAM-DEF
BSW Description	





Jump-Up value of the internal debounce counter which is taken as initialization value for the counter when the respective step-up occurs.

Template Description

This value represents the initial value of the internal debounce counter if the counting direction changes from decrementing to incrementing.

M2 Parameter

CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased.[counterJumpUpValue](#)

Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterJumpValue. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00639]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterPassedThreshold	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the value of the internal debounce counter, which indicates the passed status.	
Template Description	
This value defines the event-specific limit that indicates the "passed" counter status.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceCounterBased. counterPassedThreshold	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm.counterPassedThreshold. Applicable if DiagnosticExtract::DiagnosticCommonProps.debounceAlgorithmProps.debounceAlgorithm is modeled by means of a DiagEventDebounceCounterBased.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00636]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceCounterBasedClass
BSW Parameter	BSW Type
DemDebounceCounterStorage	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Switch to store the debounce counter value non-volatile or not. true: debounce counter value shall be stored non-volatile false: debounce counter value is volatile	
Template Description	
Switch to store the debounce counter value non-volatile or not. true: debounce counter value shall be stored non-volatile false: debounce counter value is volatile	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceAlgorithmProps. debounceCounterStorage	





Mapping Rule		Mapping Type
1:1 mapping		full
Mapping Status		ECUC Parameter ID
valid		[ECUC_Dem_00791]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass
BSW Parameter	BSW Type
DemDebounceBehavior	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This parameter defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled.	
Template Description	
This attribute defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceAlgorithmProps. debounceBehavior	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00789]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass/DemDebounceBehavior
BSW Parameter	BSW Type
DEM_DEBOUNCE_FREEZE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The event debounce timer will be frozen with the current value and will not change while a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled. After all related enable conditions are fulfilled and Control DTCSetting of the related event is enabled again, the event qualification will continue with the next report of the event (i.e. Set EventStatus).	
Template Description	
The event debounce counter will be frozen with the current value and will not change while a related enable condition is not fulfilled or Control DTCSetting of the related event is disabled. After all related enable conditions are fulfilled and Control DTCSetting of the related event is enabled again, the event qualification will continue with the next report of the event (i.e. Set EventStatus).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceBehaviorEnum. freeze	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass/DemDebounceBehavior
BSW Parameter	BSW Type
DEM_DEBOUNCE_RESET	ECUC-ENUMERATION-LITERAL-DEF





BSW Description	
The event debounce timer will be reset to initial value if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. The qualification of the event will be restarted with the next valid event report.	
Template Description	
The event debounce counter will be reset to initial value if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled. The qualification of the event will be restarted with the next valid event report.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticDebouncingAlgorithm::DiagnosticDebounceBehaviorEnum. reset	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass
BSW Parameter	BSW Type
DemDebounceTimeFailedThreshold	ECUC-FLOAT-PARAM-DEF
BSW Description	
Defines the time out duration for "Event Failed" qualification.	
The AUTOSAR configuration standard is to use SI units, so this parameter is defined as float value in seconds. Dem configuration tools must convert this float value to the appropriate value format for the use in the software implementation of Dem.	
Template Description	
This value represents the event-specific delay indicating the "failed" status.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceTimeBased. timeFailedThreshold	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00716]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass
BSW Parameter	BSW Type
DemDebounceTimePassedThreshold	ECUC-FLOAT-PARAM-DEF
BSW Description	
Defines the time out duration for "Event Passed" qualification.	
The AUTOSAR configuration standard is to use SI units, so this parameter is defined as float value in seconds. Dem configuration tools must convert this float value to the appropriate value format for the use in the software implementation of Dem.	
Template Description	
This value represents the event-specific delay indicating the "passed" status.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceTimeBased. timePassedThreshold	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status		ECUC Parameter ID
valid		[ECUC_Dem_00717]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDebounceTimeBaseClass
BSW Parameter	BSW Type
DemTimeBasedFdcThresholdStorageValue	ECUC-FLOAT-PARAM-DEF
BSW Description	
Threshold to allocate an event memory entry and to capture the Freeze Frame.	
Template Description	
Threshold to allocate an event memory entry and to capture the Freeze Frame.	
M2 Parameter	
CommonStructure::ServiceNeeds::DiagEventDebounceTimeBased. timeBasedFdcThresholdStorageValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00915]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrEventRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to the DemEventParameter this DTR is related to. If the related event is not configured, the Dem cannot ensure consistency between the DTR and the event.	
Template Description	
DiagnosticTestResult: This meta-class represents the ability to define diagnostic test results.	
DiagnosticEvent: This element is used to configure DiagnosticEvents.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult:: DiagnosticTestResult , DiagnosticExtract::Dem::DiagnosticEvent:: DiagnosticEvent	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00808]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrId	ECUC-INTEGER-PARAM-DEF
BSW Description	
The index identifier value assigned to this DTR. The value is generated during the Dem configuration process.	
Template Description	





M2 Parameter	
Mapping Rule	Mapping Type
	local
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00807]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrMid	ECUC-INTEGER-PARAM-DEF
BSW Description	
The OBDMID of the DTR.	
The values 0x00, 0x20, 0x40, 0x60, 0x80, 0xA0, 0xC0, 0xE0 are reserved.	
Template Description	
This represents the numerical measurement Id	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticMeasurementIdentifier. obdMid	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00809]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrTid	ECUC-INTEGER-PARAM-DEF
BSW Description	
The OBDTID of the DTR.	
Template Description	
This represents the numerical id associated with the diagnostic test identifier.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticTestIdIdentifier. id	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00810]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrUasid	ECUC-INTEGER-PARAM-DEF
BSW Description	
The UaSId the DTR data shall be scaled to, and reported together with the rescaled DTR data.	
Template Description	





This represents the unit and scaling Id of the diagnostic test result.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticTestIdentifier.[uasId](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00811]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr
BSW Parameter	BSW Type
DemDtrUpdateKind	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Update conditions applied by the Dem to reports of DTR values. Only supported if a related Event is configured	
Template Description	
This attribute controls the update behavior of the enclosing DiagnosticTestResult.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticTestResult. updateKind	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00812]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr/DemDtrUpdateKind
BSW Parameter	BSW Type
DEM_DTR_UPDATE_ALWAYS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Any DTR result reported by the monitor is used by the Dem.	
Template Description	
Any DTR result reported by the monitor is used by the Dem.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticTestResultUpdateEnum. always	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemDtrs/DemDtr/DemDtrUpdateKind
BSW Parameter	BSW Type
DEM_DTR_UPDATE_STEADY	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The Dem accepts reported DTRs only when the configured debouncing mechanism is stable at the FAIL or PASS limit.	





Template Description	
The Dem accepts reported DTRs only when the configured debouncing mechanism is stable at the FAIL or PASS limit.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTestResult::DiagnosticTestResultUpdateEnum. steady	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemCallbackClearEventAllowed	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
The presence of this container indicates that the Dem has access to a "ClearEventAllowed" callback.	
In case there is a DemCallbackClearEventAllowedFnc, this parameter defines the name of the function that the Dem will call.	
In case there is no DemCallbackClearEventAllowedFnc, the Dem will have an R-Port requiring the interface CallbackClearEventAllowed whose name is generated by using the unique callback-prefix followed by the event name.	
Template Description	
In case the clearing of a Diagnostic Event has to be allowed or prohibited through the SWC interface CallbackClearEventAllowed, the SWC has to indicate this by defining appropriate ServiceNeeds (i.e. DiagnosticEventNeeds).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEventClearAllowedEnum. requiresCallbackExecution	
Mapping Rule	Mapping Type
Shall be taken from DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent::DiagnosticEventClearAllowedEnum.requiresCallbackExecution. If literal requiresCallbackExecution is set, the BSW container DemCallbackClearEventAllowed will be present. Dem will call the function named by configuration parameter DemCallbackClearEventAllowedFnc. If no such function name is provided, Dem will require an R-Port with the interface name using the unique callback-prefix followed by the event name.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00607]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed
BSW Parameter	BSW Type
DemCallbackClearEventAllowedFnc	ECUC-FUNCTION-NAME-DEF
BSW Description	
Function name of prototype "ClearEventAllowed".	
Template Description	
This attribute defines whether the Dem has access to a "ClearEventAllowed" callback.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent.eventClearAllowed	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00609]

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed	
BSW Parameter	BSW Type	
DemClearEventAllowedBehavior	ECUC-ENUMERATION-PARAM-DEF	
BSW Description		
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.		
Template Description		
This attribute defines the resulting UDS status byte for the related event, which shall not be cleared according to the ClearEventAllowed callback		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. clearEventAllowedBehavior		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00788]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed/DemClearEventAllowedBehavior	
BSW Parameter	BSW Type	
DEM_NO_STATUS_BYTE_CHANGE	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
The UDS status byte keeps unchanged.		
Template Description		
The event status byte keeps unchanged.		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticClearEventAllowedBehaviorEnum. noStatusByteChange		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter/DemCallbackClearEventAllowed/DemClearEventAllowedBehavior	
BSW Parameter	BSW Type	
DEM_ONLY_THIS_CYCLE_AND_READINESS	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
The <...>ThisOperationCycle and readiness bits of the UDS status byte are reset.		
Template Description		
The OperationCycle and readiness bits of the event status byte are reset.		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticClearEventAllowedBehaviorEnum. onlyThisCycleAndReadiness		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	





valid	
-------	--

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter	
BSW Parameter	BSW Type	
DemDebounceAlgorithmClass	ECUC-CHOICE-CONTAINER-DEF	
BSW Description	Debounce algorithm class: counter based, time based, or monitor internal.	
Template Description	<p>This class represents the ability to specify the pre-debounce algorithm which is selected and/or required by the particular monitor.</p> <p>This class inherits from Identifiable in order to allow further documentation of the expected or implemented debouncing and to use the category for the identification of the expected / implemented debouncing.</p>	
M2 Parameter	CommonStructure::ServiceNeeds:: DiagEventDebounceAlgorithm	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00604]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass	
BSW Parameter	BSW Type	
DemDebounceCounterBased	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description	This container contains the configuration (parameters) for counter based debouncing.	
Template Description	<p>This meta-class represents the ability to indicate that the counter-based debounce algorithm shall be used by the DEM for this diagnostic monitor.</p> <p>This is related to set the ECUC choice container DemDebounceAlgorithmClass to DemDebounceCounterBased.</p>	
M2 Parameter	CommonStructure::ServiceNeeds:: DiagEventDebounceCounterBased	
Mapping Rule	Mapping Type	
There are two ways to derive the existence of DemDebounceCounterBased: 1. DiagEvent Needs,diagEventDebounceAlgoritm exists and is modeled as a DiagEventDebounceCounter Based. 2. DiagnosticContributionSet.commonProperties.debounceAlgorithmProps.debounce Algorithm exists and is modeled as a DiagEventDebounceCounterBased If both alternatives exist at the same time then the definition of DiagnosticContributionSet.commonProperties.debounce AlgorithmProps.debounceAlgorithm shall be handled with priority.	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00711]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass	
BSW Parameter	BSW Type	
DemDebounceMonitorInternal	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description		





This container contains the configuration (parameters) for monitor internal debouncing.

Template Description

"This meta-class represents the ability to indicate that no Dem pre-debounce algorithm shall be used for this diagnostic monitor. The SWC might implement an internal debouncing algorithm and report qualified (debounced) results to the Dem/DM.

M2 Parameter

CommonStructure::ServiceNeeds::[DiagEventDebounceMonitorInternal](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00712]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass
BSW Parameter	BSW Type
DemDebounceTimeBase	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for time based debouncing.	
Template Description	
This meta-class represents the ability to indicate that the time-based pre-debounce algorithm shall be used by the Dem for this diagnostic monitor.	
This is related to set the EcuC choice container DemDebounceAlgorithmClass to DemDebounceTimeBase.	
M2 Parameter	
CommonStructure::ServiceNeeds:: DiagEventDebounceTimeBased	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00713]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemEnableConditionGroupRef	ECUC-REFERENCE-DEF
BSW Description	
References an enable condition group.	
Template Description	
Defines which EnableConditionGroup is applicable for a DiagnosticEvent.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping:: DiagnosticEventToEnableConditionGroupMapping	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00746]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemEventAssociatedIdentification	ECUC-INTEGER-PARAM-DEF
BSW Description	
Event associated identifier that allows to identify an event. This value can be reported as internal data element in snapshot records or extended data records.	
Template Description	
This attribute represents the identification number that is associated with the enclosing DiagnosticEvent and allows to identify it when placed into a snapshot record or extended data record storage.	
This value can be reported as internal data element in snapshot records or extended data records.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. associatedEventIdentification	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00969]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemEventConfirmationThreshold	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the operation cycle threshold of the DTC confirmation status according "Confirmation Threshold" of ISO 14229-1.	
Template Description	
This attribute defines the number of operation cycles with a failed result before a confirmed DTC is set to 1. The semantic of this attribute is a by "1" increased value compared to the confirmation threshold of the "trip counter" mentioned in ISO 14229-1 in figure D.4. A value of "1" defines the immediate confirmation of the DTC along with the first reported failed. This is also sometimes called "zero trip DTC". A value of "2" defines a DTC confirmation in the operation cycle after the first occurred failed. A value of "2" is typically used in the US for OBD DTC confirmation.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. confirmationThreshold	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00924]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemEventKind	ECUC ENUMERATION-PARAM-DEF
BSW Description	
This parameter is used to distinguish between SW-C and BSW events.	
Template Description	
This attribute is used to distinguish between SWC and BSW events.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. eventKind	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00660]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemEventKind
BSW Parameter	BSW Type
DEM_EVENT_KIND_BSW	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The event is assigned to a BSW module	
Template Description	
The event is assigned to a BSW module.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEventKindEnum. bsw	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemEventKind
BSW Parameter	BSW Type
DEM_EVENT_KIND_SWC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The event is assigned to a SW-C	
Template Description	
The event is assigned to a SWC.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEventKindEnum. swc	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemEventRecoverableInSameOperationCycle	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
If parameter is configured to FALSE, reporting of PASSED will be ignored if the event is already "testfailed this operation cycle".	
Template Description	
If the attribute is set to true then reporting PASSED will reset the indication of a failed test in the current operation cycle. If the attribute is set to false then reporting PASSED will be ignored and not lead to a reset of the indication of a failed test.	





M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. recoverableInSameOperationCycle	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00916]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemFFPrestorageSupported	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
If this parameter is set to true, then the Prestorage of FreezeFrames is supported by the assigned event. This parameter is useful to calculate the buffer size.	
Template Description	
This attribute describes whether the Prestorage of FreezeFrames is supported by the assigned event or not.	
True: Prestorage of FreezeFrames is supported	
False: Prestorage of FreezeFrames is not supported	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent. prestorageFreezeFrame	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00671]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute
BSW Parameter	BSW Type
DemIndicatorBehaviour	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Behaviour of the linked indicator	
Template Description	
Behavior of the linked indicator.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicator. behavior	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00682]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute/DemIndicatorBehaviour
BSW Parameter	BSW Type
DEM_INDICATOR_BLINKING	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





The indicator blinks when the event has status FAILED Not relevant with J1939.

Template Description

The indicator blinks when the event has status FAILED.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicatorBehaviorEnum.[blinkMode](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute/DemIndicatorBehaviour
BSW Parameter	BSW Type
DEM_INDICATOR_BLINK_CONT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The indicator is active and blinks when the event has status FAILED Not relevant with J1939.	
Template Description	
The indicator is active and blinks when the event has status FAILED.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicatorBehaviorEnum. blinkOrContinuousOnMode	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute/DemIndicatorBehaviour
BSW Parameter	BSW Type
DEM_INDICATOR_CONTINUOUS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The indicator is active when the even has status FAILED	
Template Description	
The indicator is active when the event has status FAILED.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicatorBehaviorEnum. continuousOnMode	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute/DemIndicatorBehaviour
BSW Parameter	BSW Type
DEM_INDICATOR_FAST_FLASH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Flash Indicator Lamp should be set to 'Fast Flash'	
Template Description	
Flash Indicator Lamp should be set to "Fast Flash".	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicatorBehaviorEnum. fastFlashingMode	Mapping Type
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute/DemIndicatorBehaviour
BSW Parameter	BSW Type
DEM_INDICATOR_SLOW_FLASH	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Flash Indicator Lamp should be set to 'Slow Flash'	
Template Description	
Flash Indicator Lamp should be set to "Slow Flash".	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicatorBehaviorEnum. slowFlashingMode	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter/DemIndicatorAttribute
BSW Parameter	BSW Type
DemIndicatorHealingCycleCounterThreshold	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines the number of healing cycles for the WarningIndicatorOffCriteria.	
Template Description	
This attribute defines the number of healing cycles for the WarningIndicatorOffCriteria	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticConnectedIndicator.healingCycleCounterThreshold	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00748]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemEventParameter
BSW Parameter	BSW Type
DemStorageConditionGroupRef	ECUC-REFERENCE-DEF





BSW Description	
References a storage condition group.	
Template Description	
Defines which StorageConditionGroup is applicable for a DiagnosticEvent.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping:: DiagnosticEventToStorageConditionGroupMapping	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00769]

BSW Module	BSW Context
Dem	Dem/DemConfigSet
BSW Parameter	BSW Type
DemMultiEventTriggering	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
Configures an event that will trigger other events whenever the event is reported.	
Template Description	
This meta-class provides the ability to map a master diagnostic event with a slave diagnostic event such that reporting of the master event with a given value also reports the slave event with the same value	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping:: DiagnosticMasterToSlaveEventMapping	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00944]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemMultiEventTriggering
BSW Parameter	BSW Type
DemMultiEventTriggeringMasterEventRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to the event that will trigger other events upon reception of this event.	
Template Description	
This represents the master diagnostic event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping:: DiagnosticMasterToSlaveEventMapping.masterEvent	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00945]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemMultiEventTriggering
BSW Parameter	BSW Type
DemMultiEventTriggeringSlaveEventRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to the event that is triggered upon triggering the master event.	
Template Description	
This represents the slave diagnostic event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping::DiagnosticMasterToSlaveEventMapping. slaveEvent	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00946]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemObdDTC
BSW Parameter	BSW Type
DemConsiderPtoStatus	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
This parameter is TRUE, when the event is affected by the Dem PTO handling.	
Template Description	
This attribute describes the affection of the event by the Dem PTO handling.	
True: the event is affected by the Dem PTO handling.	
False: the event is not affected by the Dem PTO handling.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeObd. considerPtoStatus	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00602]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemObdDTC
BSW Parameter	BSW Type
DemDtcValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Unique Diagnostic Trouble Code value for OBD	
Template Description	
Unique Diagnostic Trouble Code value for OBD.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeObd. obdDTCValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dem_00885]
-------	------------------

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemObdDTC
BSW Parameter	BSW Type
DemEventOBDReadinessGroup	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This parameter specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This parameter is only applicable for emission-related ECUs.	
Template Description	
DiagnosticTroubleCodeObd.eventReadinessGroup: This aggregation allows for the variant definition of the attribute eventObdReadinessGroup.	
EventObdReadinessGroup.eventObdReadinessGroup: This attribute specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This attribute is only applicable for emission-related ECUs.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeObd.eventReadinessGroup, Diagnostic Extract::Dem::DiagnosticTroubleCode::EventObdReadinessGroup.eventObdReadinessGroup	
Mapping Rule	Mapping Type
Configuration is only possible if DemOBDSupport is set to DEM_OBD_MASTER_ECU (see up_Dem_00131)	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00755]

BSW Module	BSW Context
Dem	Dem/DemConfigSet/DemObdDTC
BSW Parameter	BSW Type
DemJ1939DTCValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Unique Diagnostic Trouble Code value for J1939 (consisting of SPN and FMI). The SPN is encoded in the lower number range (0xFFFF) and the FMI is encoded in the higher range (0xF80000).	
Template Description	
DiagnosticTroubleCodeJ1939.spn: This represents the releated SPN.	
DiagnosticTroubleCodeJ1939.fmi: This attribute represents the behavior of the Failure Mode Indicator.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeJ1939.spn, DiagnosticExtract::Dem::Diagnostic TroubleCode::DiagnosticTroubleCodeJ1939.fmi	
Mapping Rule	Mapping Type
The value is created out of a combination of the two attribute fmi and spn. The details are explained in the J1939-73 document	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00892]

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemPidClass	
BSW Parameter	BSW Type	
DemPidDataElement	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description		
This container contains the different data elements contained in the specific PID.		
Template Description		
This represents the data carried by the DiagnosticParameterIdentifier.		
M2 Parameter		
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. dataElement		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00896]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemPidClass/DemPidDataElement	
BSW Parameter	BSW Type	
DemPidDataElementClassRef	ECUC-REFERENCE-DEF	
BSW Description		
This reference contains the link to a data element class.		
Template Description		
This meta-class represents the ability to describe a concrete piece of data to be taken into account for diagnostic purposes.		
M2 Parameter		
DiagnosticExtract::CommonDiagnostics:: DiagnosticDataElement		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00733]	

BSW Module	BSW Context	
Dem	Dem/DemConfigSet/DemPidClass	
BSW Parameter	BSW Type	
DemPidIdentifier	ECUC-INTEGER-PARAM-DEF	
BSW Description		
identifier of the PID		
Template Description		
This is the numerical identifier used to identify the DiagnosticParameterIdentifier in the scope of diagnostic workflow (see SAE J1979-DA).		
M2 Parameter		
DiagnosticExtract::CommonDiagnostics::DiagnosticParameterIdentifier. id		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00705]	

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemAgingRequiresTestedCycle	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Defines if the aging cycle counter is processed every aging cycles or if only tested aging cycle are considered. true: only tested aging cycle are considered for aging cycle counter false: aging cycle counter is processed every aging cycle	
Template Description	
Defines whether the aging cycle counter is processed every aging cycles or else only tested aging cycle are considered. If the attribute is set to TRUE: only tested aging cycle are considered for aging cycle counter. If the attribute is set to FALSE: aging cycle counter is processed every aging cycle.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. agingRequiresTestedCycle	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00877]

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemClearDTCLimitation	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the supported Dem_<...>ClearDTC API scope.	
Template Description	
Defines the scope of the DEM_ClearDTC Api.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. clearDtcLimitation	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00790]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemClearDTCLimitation
BSW Parameter	BSW Type
DEM_ALL_SUPPORTED_DTCS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Dem_<...>ClearDTC accepts all supported DTC values, as well as all DTC values which are configured in DemGroupDTCs and DEM_DTC_GROUP_ALL_DTCS.	
Template Description	
DEM_ClearDtc API accepts all supported DTC values.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticClearDtcLimitationEnum. allSupportedDtcs	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemClearDTCLimitation
BSW Parameter	BSW Type
DEM_ONLY_CLEAR_ALL_DTCS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Dem_<...>ClearDTC accepts ClearAllDTCs only.	
Template Description	
DEM_ClearDtc API accepts ClearAllDTCs only.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticClearDtcLimitationEnum. clearAllDtcs	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemExternalCSDDataElementClass/DemDataElement Data Type
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemExternalCSDDataElementClass/DemDataElement Data Type
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemExternalSRDataElementClass/DemDataElement Data Type
BSW Parameter	BSW Type
FLOAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemExternalSRDataElementClass/DemDataElement Data Type
BSW Parameter	BSW Type
FLOAT_N	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Type of the data is float array.	
Template Description	
BaseTypeDirectDefinition.baseTypeEncoding: This specifies, how an object of the current BaseType is encoded, e.g. in an ECU within a message sequence.	
BaseTypeDirectDefinition.baseTypeSize: Describes the length of the data type specified in the container in bits.	
DiagnosticValueNeeds.fixedLength: This attribute controls whether the data length of the data is fixed.	
M2 Parameter	
AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeEncoding , AsamHdo::BaseTypes::BaseTypeDirectDefinition. baseTypeSize , CommonStructure::ServiceNeeds::DiagnosticValueNeeds. fixedLength	
Mapping Rule	Mapping Type
baseTypeEncoding = NONE, WINDOWS-1252, UTF-8, BCD-P, BCD-UP baseTypeSize = 8 max NumberOfElements shall not exist arraySizeSemantics shall not exist Derivation from Diagnostic ValueNeeds.fixedLength=1 possible.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemInternalDataElementClass
BSW Parameter	BSW Type
DemInternalDataElement	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This parameter defines the Dem-internal data value, which is mapped to the data element.	
Template Description	
This represents the ability to further specify the access within the Dem.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticDemProvidedDataMapping. dataProvider	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00616]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDataElementClass/DemInternalDataElementClass/DemInternalData Element
BSW Parameter	BSW Type
DEM_EVENT_ASSOCIATED_IDENTIFICATION	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Represents the static value associated to an event by DemEventAssociatedIdentification.	
Template Description	





This attribute represents the identification number that is associated with the enclosing DiagnosticEvent and allows to identify it when placed into a snapshot record or extended data record storage.

This value can be reported as internal data element in snapshot records or extended data records.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticEvent.[associatedEventIdentification](#)

Mapping Rule

If attribute DiagnosticEvent.associatedEventIdentification exists then the corresponding Dem InternalDataElement shall be set to DEM_EVENT_ASSOCIATED_IDENTIFICATION.

Mapping Type

full

Mapping Status
ECUC Parameter ID

valid

BSW Module	BSW Context
Dem	Dem/DemGeneral

BSW Parameter
BSW Type

DemDidClass

ECUC-PARAM-CONF-CONTAINER-DEF

BSW Description

This container contains the configuration (parameters) for a data Id class. It is assembled out of one or several data elements.

Template Description

This is the numerical identifier used to identify the DiagnosticAbstractDataIdentifier in the scope of diagnostic workflow

M2 Parameter

DiagnosticExtract::CommonDiagnostics::DiagnosticAbstractDataIdentifier.[id](#)

Mapping Rule
Mapping Type

If the subclass of DiagnosticAbstractDataIdentifier is referenced as DiagnosticTroubleCode Props.freezeFrameContent.dataIdentifier

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dem_00706]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemDidClass

BSW Parameter
BSW Type

DemDidIdentifier

ECUC-INTEGER-PARAM-DEF

BSW Description

Identifier of the Data ID.

Template Description

This is the numerical identifier used to identify the DiagnosticAbstractDataIdentifier in the scope of diagnostic workflow

M2 Parameter

DiagnosticExtract::CommonDiagnostics::DiagnosticAbstractDataIdentifier.[id](#)

Mapping Rule
Mapping Type

If the DiagnosticDataIdentifier is referenced as DiagnosticTroubleCodeProps.freezeFrame Content.dataIdentifier

full

Mapping Status
ECUC Parameter ID

valid

[ECUC_Dem_00650]

BSW Module	BSW Context
Dem	Dem/DemGeneral

BSW Parameter
BSW Type




DemEnableCondition	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for enable conditions.	
Template Description	
Specification of an enable condition.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticCondition::DiagnosticEnableCondition	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00653]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEnableCondition
BSW Parameter	BSW Type
DemEnableConditionId	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines a unique enable condition Id.	
This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The enable conditions should be sequentially ordered beginning with 0 and no gaps in between.	
Template Description	
M2 Parameter	
Mapping Rule	Mapping Type
	local
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00654]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEnableCondition
BSW Parameter	BSW Type
DemEnableConditionStatus	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Defines the initial status for enable or disable of acceptance of event reports of a diagnostic event.	
The value is the initialization after power up (before this condition is reported the first time). true: acceptance of a diagnostic event enabled false: acceptance of a diagnostic event disabled	
Template Description	
Defines the initial status for enable or disable of acceptance/storage of event reports of a diagnostic event. The value is the initialization after power up (before this condition is reported the first time).	
true: acceptance/storage of a diagnostic event enabled	
false: acceptance/storage of a diagnostic event disabled	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticCondition::DiagnosticCondition.initValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dem_00656]
-------	------------------

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemEnableConditionGroup	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for enable condition groups.	
Template Description	
Enable condition group which includes one or several enable conditions.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticConditionGroup::DiagnosticEnableConditionGroup	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00745]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEnableConditionGroup
BSW Parameter	BSW Type
DemEnableConditionRef	ECUC-REFERENCE-DEF
BSW Description	
References an enable condition.	
Template Description	
Reference to enableConditions that are part of the EnableConditionGroup.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticConditionGroup::DiagnosticEnableConditionGroup.enableCondition	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00655]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemIndicator	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for Indicators.	
Template Description	
Definition of an indicator.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticIndicator::DiagnosticIndicator	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID





valid	[ECUC_Dem_00680]
-------	------------------

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemMILIndicatorRef	ECUC-REFERENCE-DEF
BSW Description	
This parameter defines the indicator representing the MIL.	
This parameter is mandatory for ECUs supporting OBD (refer to DemOBDSupport).	
Template Description	
Defines the type of the indicator.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticIndicator::DiagnosticIndicator.type	
Mapping Rule	Mapping Type
DignosticIndicator.type == DiagnosticIndicatorTypeEnum.malfunction	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00723]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemMirrorMemory	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the mirror event memory specific parameters of the Dem module.	
Template Description	
This represents a mirror memory for a diagnostic event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestinationMirror	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00902]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemMirrorMemory
BSW Parameter	BSW Type
DemMaxNumberEventEntryMirror	ECUC-INTEGER-PARAM-DEF
BSW Description	
Maximum number of events which can be stored in the mirror memory	
Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.maxNumberOfEventEntries	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00688]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemPrimaryMemory	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the primary event memory specific parameters of the Dem module.	
Template Description	
This represents a primary memory for a diagnostic event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestinationPrimary	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00901]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemDtcStatusAvailabilityMask	ECUC-INTEGER-PARAM-DEF
BSW Description	
Mask for the supported DTC status bits by the Dem. This mask is used in the positive response of UDS service 0x19.	
Template Description	
Mask for the supported DTC status bits by the Dem.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination.dtcStatusAvailabilityMask	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00652]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemEnvironmentDataCapture	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
DemEnvironmentDataCapture defines the point in time, when the data actually is captured.	
Template Description	
This attribute determines the point in time, when the data actually is captured.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps.environmentCaptureToReporting	
Mapping Rule	Mapping Type





1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00895]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemEnvironmentDataCapture
BSW Parameter	BSW Type
DEM_CAPTURE_ASYNCROUS_TO_REPORTING	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The data capturing is postponed to the next cycle of the Dem_Mainfunction. (This means that there is a minimum delay between report of the failure and capturing the data).	
Template Description	
The data capturing is postponed to the next cycle of the Dem_Mainfunction. (This means that there is a minimum delay between report of the failure and capturing the data).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::EnvironmentCaptureToReportingEnum. captureAsynchronousToReporting	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemEnvironmentDataCapture
BSW Parameter	BSW Type
DEM_CAPTURE_SYNCHRONOUS_TO_REPORTING	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The data is captured immediately within the context of Dem_SetEventStatus.	
Template Description	
The data is captured immediately within the reporting function (i.e. in the context of the setEventStatus/reportErrorStatus function).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::EnvironmentCaptureToReportingEnum. captureSynchronousToReporting	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemEventDisplacementStrategy	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This configuration switch defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.	





Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.eventDisplacementStrategy	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00742]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemEventDisplacementStrategy
BSW Parameter	BSW Type
DEM_DISPLACEMENT_FULL	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event memory entry displacement is enabled, by consideration of priority active/passive status, and occurrence.	
Template Description	
Event memory entry displacement is enabled, by consideration of priority active/passive status, and occurrence.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. full	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemEventDisplacementStrategy
BSW Parameter	BSW Type
DEM_DISPLACEMENT_NONE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event memory entry displacement is disabled.	
Template Description	
Event memory entry displacement is disabled.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. none	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemEventDisplacementStrategy
BSW Parameter	BSW Type
DEM_DISPLACEMENT_PRIO_OCC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event memory entry displacement is enabled, by consideration of priority and occurrence (but without active/passive status).	





Template Description	
Event memory entry displacement is enabled, by consideration of priority and occurrence (but without active/passive status).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. prioOcc	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemEventMemoryEntryStorageTrigger	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Configures the primary trigger to allocate an event memory entry.	
Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. memoryEntryStorageTrigger	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00797]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemMaxNumberEventEntryPrimary	ECUC-INTEGER-PARAM-DEF
BSW Description	
Maximum number of events which can be stored in the primary memory	
Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. maxNumberOfEventEntries	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00690]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory
BSW Parameter	BSW Type
DemOccurrenceCounterProcessing	ECUC-ENUMERATION-PARAM-DEF
BSW Description	





This configuration switch defines the consideration of the fault confirmation process for the occurrence counter. For OBD and mixed systems (OBD/non OBD, refer to DemOBDSupport) configuration switch shall always set to DEM_PROCESS_OCCCTR_TF.

Template Description

This attribute defines the consideration of the fault confirmation process for the occurrence counter.

M2 Parameter

DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.[occurrenceCounterProcessing](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00767]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemOccurrenceCounter Processing
BSW Parameter	BSW Type
DEM_PROCESS_OCCCTR_CDTC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
the occurrence counter is triggered by the TestFailed bit if the fault confirmation was successful (ConfirmedDTC bit is set)	
Template Description	
The occurrence counter is triggered by the TestFailed bit if the fault confirmation was successful (ConfirmedDTC bit is set).	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticOccurrenceCounterProcessingEnum. confirmedDtcBit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemOccurrenceCounter Processing
BSW Parameter	BSW Type
DEM_PROCESS_OCCCTR_TF	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
the occurrence counter is only triggered by the TestFailed bit (and the fault confirmation is not considered). This parameter is mandatory in case of J1939.	
Template Description	
The occurrence counter is only triggered by the TestFailed bit (and the fault confirmation is not considered).	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticOccurrenceCounterProcessingEnum. testFailedBit	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context			
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory			
BSW Parameter	BSW Type			
DemTypeOfFreezeFrameRecordNumeration	ECUC-ENUMERATION-PARAM-DEF			
BSW Description				
This parameter defines the type of assigning freeze frame record numbers for event-specific freeze frame records.				
Template Description				
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.				
M2 Parameter				
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination. typeOfFreezeFrameRecordNumeration				
Mapping Rule		Mapping Type		
1:1 mapping		full		
Mapping Status		ECUC Parameter ID		
valid		[ECUC_Dem_00778]		

BSW Module	BSW Context			
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemTypeOfFreezeFrameRecord Numeration			
BSW Parameter	BSW Type			
DEM_FF_RECNUM_CALCULATED	ECUC-ENUMERATION-LITERAL-DEF			
BSW Description				
freeze frame records will be numbered consecutive starting by 1 in their chronological order				
Template Description				
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.				
M2 Parameter				
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination. typeOfFreezeFrameRecordNumeration				
Mapping Rule		Mapping Type		
If DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration is set to DiagnosticTypeOf FreezeFrameRecordNumerationEnum.calculated		full		
Mapping Status		ECUC Parameter ID		
valid				

BSW Module	BSW Context			
Dem	Dem/DemGeneral/DemEventMemorySet/DemPrimaryMemory/DemTypeOfFreezeFrameRecord Numeration			
BSW Parameter	BSW Type			
DEM_FF_RECNUM_CONFIGURED	ECUC-ENUMERATION-LITERAL-DEF			
BSW Description				
freeze frame records will be numbered based on the given configuration in their chronological order				
Template Description				
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.				
M2 Parameter				
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination. typeOfFreezeFrameRecordNumeration				
Mapping Rule		Mapping Type		
If DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration is set to DiagnosticTypeOf FreezeFrameRecordNumerationEnum.configured.		full		





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemTypeOfDTCSupported	ECUC-ENUMERATION-PARAM-DEF

BSW Description

This parameter defines the format returned by Dem_GetTranslationType and does not relate to/influence the supported Dem functionality.

Template Description
M2 Parameter

DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.typeOfDtcSupported

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00720]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemTypeOfDTCSupported
BSW Parameter	BSW Type
DEM_DTC_TRANSLATION_ISO11992_4	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

ISO11992-4 DTC format

Template Description

ISO11992-4 DTC format

M2 Parameter

DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTypeOfDtcSupportedEnum.[iso11992_4](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemTypeOfDTCSupported
BSW Parameter	BSW Type
DEM_DTC_TRANSLATION_ISO14229_1	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

ISO14229-1 DTC format (3 byte format)

Template Description

ISO14229-1 DTC format (3 byte format)

M2 Parameter

DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTypeOfDtcSupportedEnum.[iso14229_1](#)

Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemTypeOfDTCSupported
BSW Parameter	BSW Type
DEM_DTC_TRANSLATION_SAEJ1939_73	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
SAEJ1939-73 DTC format	
Template Description	
SAEJ1939-73 DTC format	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTypeOfDtcSupportedEnum. saeJ1939_73	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemTypeOfDTCSupported
BSW Parameter	BSW Type
DEM_DTC_TRANSLATION_SAE_J2012_DA_DTCFORMAT_04	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
SAE_J2012-DA_DTCFormat_00 (3 byte format)	
Template Description	
SAE_J2012-DA_DTCFormat_00 (3 byte format)	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTypeOfDtcSupportedEnum. saeJ2012_da	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet
BSW Parameter	BSW Type
DemUserDefinedMemory	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the user defined event memory specific parameters of the Dem module.	
Template Description	
This represents a user-defined memory for a diagnostic event.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestinationUserDefined	
Mapping Rule	Mapping Type





1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00910]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemDtcStatusAvailabilityMask	ECUC-INTEGER-PARAM-DEF
BSW Description	
Mask for the supported DTC status bits by the Dem. This mask is used in the positive response of UDS service 0x19.	
Template Description	
Mask for the supported DTC status bits by the Dem.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination. dtcStatusAvailabilityMask	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00652]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemEnvironmentDataCapture	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
DemEnvironmentDataCapture defines the point in time, when the data actually is captured.	
Template Description	
This attribute determines the point in time, when the data actually is captured.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps. environmentCaptureToReporting	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00895]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemEnvironmentDataCapture
BSW Parameter	BSW Type
DEM_CAPTURE_ASYNCROUS_TO_REPORTING	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
The data capturing is postponed to the next cycle of the Dem_Mainfunction. (This means that there is a minimum delay between report of the failure and capturing the data).	
Template Description	
The data capturing is postponed to the next cycle of the Dem_Mainfunction. (This means that there is a minimum delay between report of the failure and capturing the data).	
M2 Parameter	





DiagnosticExtract::Dem::DiagnosticTroubleCode::EnvironmentCaptureToReportingEnum.
 captureAsynchronousToReporting

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemEnvironmentDataCapture	
BSW Parameter	BSW Type	
DEM_CAPTURE_SYNCHRONOUS_TO_REPORTING	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	The data is captured immediately within the context of Dem_SetEventStatus.	
Template Description	The data is captured immediately within the reporting function (i.e. in the context of the setEventStatus/reportErrorStatus function).	
M2 Parameter	DiagnosticExtract::Dem::DiagnosticTroubleCode::EnvironmentCaptureToReportingEnum. captureSynchronousToReporting	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory	
BSW Parameter	BSW Type	
DemEventDisplacementStrategy	ECUC-ENUMERATION-PARAM-DEF	
BSW Description	This configuration switch defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.	
Template Description		
M2 Parameter	DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.eventDisplacementStrategy	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00742]	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemEventDisplacementStrategy	
BSW Parameter	BSW Type	
DEM_DISPLACEMENT_FULL	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	Event memory entry displacement is enabled, by consideration of priority active/passive status, and occurrence.	





Template Description	
Event memory entry displacement is enabled, by consideration of priority active/passive status, and occurrence.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. full	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemEventDisplacementStrategy
BSW Parameter	BSW Type
DEM_DISPLACEMENT_NONE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event memory entry displacement is disabled.	
Template Description	
Event memory entry displacement is disabled.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. none	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemEventDisplacementStrategy
BSW Parameter	BSW Type
DEM_DISPLACEMENT_PRIO_OCC	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event memory entry displacement is enabled, by consideration of priority and occurrence (but without active/passive status).	
Template Description	
Event memory entry displacement is enabled, by consideration of priority and occurrence (but without active/passive status).	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticEventDisplacementStrategyEnum. priorOcc	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemEventMemoryEntryStorageTrigger	ECUC-ENUMERATION-PARAM-DEF



△

BSW Description	
Configures the primary trigger to allocate an event memory entry.	
Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.memoryEntryStorageTrigger	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00797]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemMaxNumberEventEntryUserDefined	ECUC-INTEGER-PARAM-DEF
BSW Description	
Maximum number of events which can be stored in the user defined memory.	
Template Description	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.maxNumberOfEventEntries	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00691]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemOccurrenceCounterProcessing	ECUC ENUMERATION-PARAM-DEF
BSW Description	
This configuration switch defines the consideration of the fault confirmation process for the occurrence counter. For OBD and mixed systems (OBD/non OBD, refer to DemOBDSupport) configuration switch shall always set to DEM_PROCESS_OCCCTR_TF.	
Template Description	
This attribute defines the consideration of the fault confirmation process for the occurrence counter.	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps.occurrenceCounterProcessing	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00767]

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemOccurrenceCounter Processing	
BSW Parameter	BSW Type	
DEM_PROCESS_OCCCTR_CDTC	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
the occurrence counter is triggered by the TestFailed bit if the fault confirmation was successful (ConfirmedDTC bit is set)		
Template Description		
The occurrence counter is triggered by the TestFailed bit if the fault confirmation was successful (ConfirmedDTC bit is set).		
M2 Parameter		
DiagnosticExtract::DiagnosticCommonProps::DiagnosticOccurrenceCounterProcessingEnum. confirmedDtcBit		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemOccurrenceCounter Processing	
BSW Parameter	BSW Type	
DEM_PROCESS_OCCCTR_TF	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
the occurrence counter is only triggered by the TestFailed bit (and the fault confirmation is not considered) This parameter is mandatory in case of J1939.		
Template Description		
The occurrence counter is only triggered by the TestFailed bit (and the fault confirmation is not considered).		
M2 Parameter		
DiagnosticExtract::DiagnosticCommonProps::DiagnosticOccurrenceCounterProcessingEnum. testFailedBit		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory	
BSW Parameter	BSW Type	
DemTypeOfFreezeFrameRecordNumeration	ECUC-ENUMERATION-PARAM-DEF	
BSW Description		
This parameter defines the type of assigning freeze frame record numbers for event-specific freeze frame records.		
Template Description		
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination. typeOfFreezeFrameRecordNumeration		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	





valid	[ECUC_Dem_00778]
-------	------------------

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemTypeOfFreezeFrameRecordNumeration
BSW Parameter	BSW Type
DEM_FF_RECNUM_CALCULATED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
freeze frame records will be numbered consecutive starting by 1 in their chronological order	
Template Description	
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration	
Mapping Rule	Mapping Type
If DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration is set to DiagnosticTypeOfFreezeFrameRecordNumerationEnum.calculated	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory/DemTypeOfFreezeFrameRecordNumeration
BSW Parameter	BSW Type
DEM_FF_RECNUM_CONFIGURED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
freeze frame records will be numbered based on the given configuration in their chronological order	
Template Description	
This attribute defines the type of assigning freeze frame record numbers for event-specific freeze frame records.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration	
Mapping Rule	Mapping Type
If DiagnosticMemoryDestination.typeOfFreezeFrameRecordNumeration is set to DiagnosticTypeOfFreezeFrameRecordNumerationEnum.configured.	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemEventMemorySet/DemUserDefinedMemory
BSW Parameter	BSW Type
DemUserDefinedMemoryIdentifier	ECUC-INTEGER-PARAM-DEF
BSW Description	
Identifier used by external tester to identify the User defined event memory.	
Template Description	
This represents the identifier of the user-defined memory.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticMemoryDestinationUserDefined.memoryId	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00903]

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemExtendedDataRecordClass	
BSW Parameter	BSW Type	
DemExtendedDataRecordNumber	ECUC-INTEGER-PARAM-DEF	
BSW Description	<p>This configuration parameter specifies an unique identifier for an extended data record.</p> <p>One or more extended data records can be assigned to one diagnostic event/DTC.</p> <p>0x00 is reserved by ISO (therefore the minimal value equals 1)</p> <p>0xF0 to 0xFF are reserved by ISO (therefore the maximal value equals 239)</p>	
Template Description	<p>This attribute specifies an unique identifier for an extended data record.</p>	
M2 Parameter	<p>DiagnosticExtract::Dem::DiagnosticExtendedDataRecord::DiagnosticExtendedDataRecord.recordNumber</p>	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00666]	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemExtendedDataRecordClass	
BSW Parameter	BSW Type	
DemExtendedDataRecordTrigger	ECUC-ENUMERATION-PARAM-DEF	
BSW Description	<p>Defines the trigger to store the ExtendedDataRecord.</p>	
Template Description	<p>This attribute specifies the primary trigger to allocate an event memory entry.</p>	
M2 Parameter	<p>DiagnosticExtract::Dem::DiagnosticExtendedDataRecord::DiagnosticExtendedDataRecord.trigger</p>	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00804]	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemExtendedDataRecordClass/DemExtendedDataRecordTrigger	
BSW Parameter	BSW Type	
DEM_TRIGGER_ON_CONFIRMED	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description	<p>ExtendedDataRecord will be stored when the UDS status confirmed bit changes from 0 to 1.</p>	





Template Description	
capture on "Confirmed"	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticRecordTriggerEnum. confirmed	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	
BSW Parameter	
DEM_TRIGGER_ON_FDC_THRESHOLD	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
ExtendedDataRecord will be stored when the FDC reaches its threshold.	
Template Description	
capture on "FDC Threshold"	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticRecordTriggerEnum. fdcThreshold	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	
BSW Parameter	
DEM_TRIGGER_ON_PENDING	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
ExtendedDataRecord will be stored when the UDS status pending bit changes from 0 to 1.	
Template Description	
capture on "Pending"	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticRecordTriggerEnum. pending	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	
BSW Parameter	
DEM_TRIGGER_ON_TEST_FAILED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
ExtendedDataRecord will be stored when the UDS status test failed bit changes from 0 to 1.	





Template Description	
capture on "Test Failed"	
M2 Parameter	
	DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticRecordTriggerEnum. testFailed
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemExtendedDataRecordClass
BSW Parameter	BSW Type
DemExtendedDataRecordUpdate	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This extended data record is captured if the configured trigger condition in "DemExtendedDataRecordTrigger" is fulfilled.	
Template Description	
This attribute defines when an extended data record is captured.	
True: This extended data record is captured every time.	
False: This extended data record is only captured for new event memory entries.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticExtendedDataRecord::DiagnosticExtendedDataRecord. update	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00621]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemFreezeFrameRecordClass
BSW Parameter	BSW Type
DemFreezeFrameRecordNumber	ECUC-INTEGER-PARAM-DEF
BSW Description	
This parameter defines a record number for a freeze frame record. This record number is unique per freeze frame record number class.	
Template Description	
This attribute defines a record number for a freeze frame record.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticFreezeFrame. recordNumber	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00777]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemFreezeFrameRecordClass
BSW Parameter	BSW Type





DemFreezeFrameRecordTrigger	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Defines the trigger to store the FreezeFrameRecord.	
Template Description	
This attribute defines the primary trigger to allocate an event memory entry.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticFreezeFrame. trigger	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00803]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemFreezeFrameRecordClass/DemFreezeFrameRecordTrigger
BSW Parameter	BSW Type
DEM_TRIGGER_ON_TEST_FAILED_THIS_OPERATION_CYCLE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Event Memory entries are triggered if the UDS status bit 1 (testFailedThisOperationCycle) changes from 0 to 1.	
Template Description	
Test Failed This Operation Cycle.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticRecordTriggerEnum. testFailedThisOperationCycle	
Mapping Rule	Mapping Type
	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemFreezeFrameRecordClass
BSW Parameter	BSW Type
DemFreezeFrameRecordUpdate	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This parameter defines the case, when the freeze frame record is stored/updated.	
Template Description	
This attribute defines the approach when the freeze frame record is stored/updated.	
True: FreezeFrame record is captured every time.	
False: FreezeFrame record is only captured for new event memory entries.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticFreezeFrame::DiagnosticFreezeFrame. update	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00802]

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemOBDSupport	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This configuration switch defines OBD support and kind of OBD ECU.	
Template Description	
This attribute is used to specify the role (if applicable) in which the DiagnosticEcuInstance supports OBD.	
M2 Parameter	
DiagnosticExtract::DiagnosticContribution::DiagnosticEcuInstanceProps. obdSupport	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00698]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemOBDSupport
BSW Parameter	BSW Type
DEM_OBD_DEP_SEC_ECU	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Kind of OBD ECU: OBD Dependend / Secondary ECU	
Template Description	
This represents the role "secondary ECU".	
M2 Parameter	
DiagnosticExtract::DiagnosticContribution::DiagnosticObdSupportEnum. secondaryEcu	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemOBDSupport
BSW Parameter	BSW Type
DEM_OBD_MASTER_ECU	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Kind of OBD ECU: Master ECU	
Template Description	
This represent the role "master ECU".	
M2 Parameter	
DiagnosticExtract::DiagnosticContribution::DiagnosticObdSupportEnum. masterEcu	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemOBDSupport	
BSW Parameter	BSW Type	
DEM_OBD_NO_OBD_SUPPORT	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
OBD is not supported within this ECU		
Template Description		
This represents the ability to explicitly specify that no participation in OBD is foreseen.		
M2 Parameter		
DiagnosticExtract::DiagnosticContribution::DiagnosticObdSupportEnum.noObdSupport		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemOBDSupport	
BSW Parameter	BSW Type	
DEM_OBD_PRIMARY_ECU	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Kind of OBD ECU: Primary ECU		
Template Description		
This represents the role "primary ECU".		
M2 Parameter		
DiagnosticExtract::DiagnosticContribution::DiagnosticObdSupportEnum.primaryEcu		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral	
BSW Parameter	BSW Type	
DemOperationCycle	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description		
This container holds all parameters that are relevant to configure an operation cycle.		
Template Description		
Definition of an operation cycle that is the base of the event qualifying and for Dem scheduling.		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticOperationCycle::DiagnosticOperationCycle		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00701]	

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemRatio	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the OBD-specific in-use-monitor performance ratio configuration. It is related to a specific event, a FID, and an IUMPR group.	
Template Description	
ObdRatioServiceNeeds: Specifies the abstract needs of a component or module on the configuration of OBD Services in relation to a particular "ratio monitoring" which is supported by this component or module.	
DiagnosticlumprGroup: This meta-class represents the ability to model a IUMPR groups.	
M2 Parameter	
CommonStructure::ServiceNeeds::ObdRatioServiceNeeds, DiagnosticExtract::Dem::DiagnosticEvent:: DiagnosticIumprGroup	
Mapping Rule	Mapping Type
In case the owner of the ObdRatioServiceNeeds is a BSW module then the DemRatio.shortName = {capitalizedMip}_{ServiceDependency.symbolicNameProps.symbol}. For the Diagnosticlumpr Group the mapping rule is 1:1	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00734]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio
BSW Parameter	BSW Type
DemDiagnosticEventRef	ECUC-REFERENCE-DEF
BSW Description	
This reference contains the link to a diagnostic event.	
Template Description	
DiagnosticlumprGroup.iumpr: This reference collects Diagnosticlumpr to a DiagnosticlumprGroup.	
Diagnosticlumpr.event: This reference represents the DiagnosticEvent that corresponds to the IUMPR computation.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup. iumpr , DiagnosticExtract::Dem::DiagnosticEvent::Diagnosticlumpr. event	
Mapping Rule	Mapping Type
foreach DiagnosticlumprGroup, follow the iumpr reference and then pick the target of the event reference	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00735]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio
BSW Parameter	BSW Type
DemIUMPRDenGroup	ECUC-ENUMERATION-PARAM-DEF
BSW Description	





This parameter specifies the assigned denominator type which is applied in addition to the DEM_IUMPR_GENERAL_INDIVIDUAL_DENOMINATOR conditions.

Template Description

This meta-class represents the ability to model a IUMPR denominator groups.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticEvent::[DiagnosticIumprDenominatorGroup](#)

Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00838]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRDenGroup

BSW Parameter	BSW Type
DEM_IUMPR_DEN_500MILL	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Additional condition based on definition of 500miles conditions as defined for OBD2.

Template Description
DiagnosticIumprDenominatorGroup.iumpr:

This reference collects DiagnosticIumpr to a DiagnosticIumprDenominatorGroup.

Identifiable.category:

The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticIumprDenominatorGroup.[iumpr](#), GenericStructure::GeneralTemplate Classes::Identifiable::Identifiable.category

Mapping Rule	Mapping Type
DiagnosticIumprDenominatorGroup.category ==IUMPR_DENOMINATOR_500_MILES	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRDenGroup

BSW Parameter	BSW Type
DEM_IUMPR_DEN_COLDSTART	ECUC-ENUMERATION-LITERAL-DEF

BSW Description

Additional condition based on definition of "cold start" as defined for EU5+

Template Description
DiagnosticIumprDenominatorGroup.iumpr:

This reference collects DiagnosticIumpr to a DiagnosticIumprDenominatorGroup.

Identifiable.category:

The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticIumprDenominatorGroup.[iumpr](#), GenericStructure::GeneralTemplate Classes::Identifiable::Identifiable.category

Mapping Rule	Mapping Type
--------------	--------------





DiagnosticlumprDenominatorGroup == IUMPR_DENOMINATOR_COLDSTART	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRDenGroup
BSW Parameter	BSW Type
DEM_IUMPR_DEN_EVAP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Additional condition based on definition of "EVAP" conditions as defined for OBD2.	
Template Description	
DiagnosticlumprDenominatorGroup.iump: This reference collects Diagnosticlumpr to a DiagnosticlumprDenominatorGroup.	
Identifiable.category: The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprDenominatorGroup.iump, GenericStructure::GeneralTemplate Classes::Identifiable::Identifiable.category	
Mapping Rule	Mapping Type
DiagnosticlumprDenominatorGroup.category == IUMPR_DENOMINATOR_EVAP	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRDenGroup
BSW Parameter	BSW Type
DEM_IUMPR_DEN_NONE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
No further condition. Denominator increments based on GENERAL_INDIVIDUAL_DENOMINATOR only.	
Template Description	
DiagnosticlumprDenominatorGroup.iump: This reference collects Diagnosticlumpr to a DiagnosticlumprDenominatorGroup.	
Identifiable.category: The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprDenominatorGroup.iump, GenericStructure::GeneralTemplate Classes::Identifiable::Identifiable.category	
Mapping Rule	Mapping Type
DiagnosticlumprDenominatorGroup.category == IUMPR_DENOMINATOR_NONE	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRDenGroup
BSW Parameter	BSW Type





DEM_IUMPR_DEN_PHYS_API	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Additional physical condition (component activity) computed within the SW-C and reported via Dem_ReplUMPRDenRelease.	
Template Description	
DiagnosticlumprDenominatorGroup.iumpri: This reference collects Diagnosticlumpr to a DiagnosticlumprDenominatorGroup.	
Identifiable.category: The category is a keyword that specializes the semantics of the Identifiable. It affects the expected existence of attributes and the applicability of constraints.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprDenominatorGroup. iumpri , GenericStructure::GeneralTemplate Classes::Identifiable::Identifiable. category	
Mapping Rule	
DiagnosticlumprDenominatorGroup.category == IUMPR_DENOMINATOR_PHYSICAL_API	full
Mapping Status	
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio
BSW Parameter	BSW Type
DemIUMPRGroup	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
This parameter specifies the assigned IUMPR group of the ratio Id.	
Template Description	
DiagnosticlumprGroup.iumpriGroupIdentifier: This aggregation allows for the variant modeling of the groupIdentifier.	
DiagnosticlumprGroupIdentifier.groupId: This attribute shall be taken to define an identifier for the IUMPR group. Please note that the value of this identifier is driven by regulations outside the scope of AUTOSAR and can therefore not be limited to the set of characters suitable for a shortName.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup. iumpriGroupIdentifier , Diagnostic Extract::Dem::DiagnosticEvent::DiagnosticlumprGroupIdentifier. groupId	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00737]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_AFRI1	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Air Fuel Ratio Imbalance Monitor Bank 1	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup. groupIdentifier	
Mapping Rule	





If groupIdentifier is set to DEM_IUMPR_AFRI1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_AFRI2	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Air Fuel Ratio Imbalance Monitor Bank 2
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_AFRI2	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_BOOSTPRS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_BOOSTPRS	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_CAT1	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_CAT1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup	
BSW Parameter	BSW Type	
DEM_IUMPR_CAT2	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier		
Mapping Rule	Mapping Type	
If groupIdentifier is set to DEM_IUMPR_CAT2	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup	
BSW Parameter	BSW Type	
DEM_IUMPR_EGR	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier		
Mapping Rule	Mapping Type	
if groupIdentifier is set to DEM_IUMPR_EGR	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup	
BSW Parameter	BSW Type	
DEM_IUMPR_EGSENSOR	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier		
Mapping Rule	Mapping Type	
If groupIdentifier is set to DEM_IUMPR_EGSENSOR.	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type





DEM_IUMPR_EVAP	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_EVAP	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_FLSYS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_FLSYS	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_NMHCCAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_NMHCCAT	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_NOXADSORB	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	





Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_NOXADSORB	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_NOXCAT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_NOXCAT	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_OXS1	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier ist set to DEM_IUMPR_OXS1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_OXS2	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	





Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_OSX2	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_PF1	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Particulate Filter Monitor Bank 1
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_PF1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_PF2	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Particulate Filter Monitor Bank 2
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_PF2	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_PMFILTER	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_PMFILTER	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_PRIVATE	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_PRIVATE	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_SAIR	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_SAIR	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup
BSW Parameter	BSW Type
DEM_IUMPR_SECOXS1	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier	
Mapping Rule	Mapping Type
If groupIdentifier is set to DEM_IUMPR_SECOXS1	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context	
Dem	Dem/DemGeneral/DemRatio/DemIUMPRGroup	
BSW Parameter	BSW Type	
DEM_IUMPR_SECOXS2	ECUC-ENUMERATION-LITERAL-DEF	
BSW Description		
Template Description		
M2 Parameter		
DiagnosticExtract::Dem::DiagnosticEvent::DiagnosticlumprGroup.groupIdentifier		
Mapping Rule	Mapping Type	
If groupIdentifier is set to DEM_IUMPR_SECOXS2	full	
Mapping Status	ECUC Parameter ID	
valid		

BSW Module	BSW Context	
Dem	Dem/DemGeneral	
BSW Parameter	BSW Type	
DemResetConfirmedBitOnOverflow	ECUC-BOOLEAN-PARAM-DEF	
BSW Description		
This configuration switch defines, whether the confirmed bit is reset or not while an event memory entry will be displaced.		
Template Description		
This attribute defines, whether the confirmed bit is reset or not while an event memory entry will be displaced.		
M2 Parameter		
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. resetConfirmedBitOnOverflow		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00799]	

BSW Module	BSW Context	
Dem	Dem/DemGeneral	
BSW Parameter	BSW Type	
DemStatusBitHandlingTestFailedSinceLastClear	ECUC-ENUMERATION-PARAM-DEF	
BSW Description		
This configuration switch defines, whether the aging and displacement mechanism shall be applied to the "TestFailedSinceLastClear" status bits.		
Template Description		
This attribute defines, whether the aging and displacement mechanism shall be applied to the "TestFailedSinceLastClear" status bits.		
M2 Parameter		
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. statusBitHandlingTestFailedSinceLastClear		
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_Dem_00784]	

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemStatusBitStorageTestFailed	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Activate/Deactivate the permanent storage of the "TestFailed" status bits. true: storage activated false: storage deactivated	
Template Description	
This parameter is used to activate/deactivate the permanent storage of the "TestFailed" status bits. true: storage activated false: storage deactivated	
M2 Parameter	
DiagnosticExtract::DiagnosticCommonProps::DiagnosticCommonProps. statusBitStorageTestFailed	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00714]

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemStorageCondition	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for storage conditions.	
Template Description	
Specification of a storage condition.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticCondition:: DiagnosticStorageCondition	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00728]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemStorageCondition
BSW Parameter	BSW Type
DemStorageConditionId	ECUC-INTEGER-PARAM-DEF
BSW Description	
Defines a unique storage condition Id. This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The storage conditions should be sequentially ordered beginning with 0 and no gaps in between.	
Template Description	
M2 Parameter	
Mapping Rule	Mapping Type





Mapping Status	local
valid	[ECUC_Dem_00730]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemStorageCondition
BSW Parameter	BSW Type
DemStorageConditionReplacementEventRef	ECUC-REFERENCE-DEF
BSW Description	
Specifies the reference to an event which is stored to event memory and supports failure analysis.	
Template Description	
Reference to a DiagnosticEvent to which a StorageConditionGroup is assigned.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticMapping::DiagnosticEventToStorageConditionGroupMapping. diagnosticEvent	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00893]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemStorageCondition
BSW Parameter	BSW Type
DemStorageConditionStatus	ECUC-BOOLEAN-PARAM-DEF
BSW Description	
Defines the initial status for enable or disable of storage of a diagnostic event.	
The value is the initialization after power up (before this condition is reported the first time). true: storage of a diagnostic event enabled false: storage of a diagnostic event disabled	
Template Description	
Defines the initial status for enable or disable of acceptance/storage of event reports of a diagnostic event. The value is the initialization after power up (before this condition is reported the first time).	
true: acceptance/storage of a diagnostic event enabled	
false: acceptance/storage of a diagnostic event disabled	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticCondition::DiagnosticCondition. initValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_Dem_00731]

BSW Module	BSW Context
Dem	Dem/DemGeneral
BSW Parameter	BSW Type
DemStorageConditionGroup	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration (parameters) for storage condition groups.	





Template Description	
Storage condition group which includes one or several storage conditions.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticConditionGroup:: DiagnosticStorageConditionGroup	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00773]

BSW Module	BSW Context
Dem	Dem/DemGeneral/DemStorageConditionGroup
BSW Parameter	BSW Type
DemStorageConditionRef	ECUC-REFERENCE-DEF
BSW Description	
References an enable condition.	
Template Description	
Reference to storageConditions that are part of the StorageConditionGroup.	
M2 Parameter	
DiagnosticExtract::Dem::DiagnosticConditionGroup::DiagnosticStorageConditionGroup. storageCondition	
Mapping Rule	
1:1 mapping	full
Mapping Status	
valid	[ECUC_Dem_00768]

E.4 Fim

BSW Module	BSW Context
FIM	FIM/FIMConfigSet
BSW Parameter	BSW Type
FiMFID	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container includes symbolic names of all FIDs.	
Template Description	
FunctionInhibitionNeeds: Specifies the abstract needs on the configuration of the Function Inhibition Manager for one Function Identifier (FID). This class currently contains no attributes. Its name can be regarded as a symbol identifying the FID from the viewpoint of the component or module which owns this class.	
DiagnosticFunctionIdentifier: This meta-class represents a diagnostic function identifier (a.k.a. FID).	
M2 Parameter	
CommonStructure::ServiceNeeds:: FunctionInhibitionNeeds , DiagnosticExtract::Fim:: DiagnosticFunctionIdentifier	
Mapping Rule	
In case the owner of the FunctionInhibitionNeeds is a BSW module then the FiMFID.shortName= {capitalizedMip}_{ServiceDependency.symbolicNameProps.symbol}.	





Mapping Status	ECUC Parameter ID
valid	[ECUC_FiM_00039]

BSW Module	BSW Context	
FiM	FiM/FiMConfigSet	
BSW Parameter	BSW Type	
FiMIInhibitionConfiguration	ECUC-PARAM-CONF-CONTAINER-DEF	
BSW Description	This container includes all configuration parameters concerning the relationship between event and FID.	
Template Description	This meta-class represents the ability to define the inhibition of a specific function identifier within the Fim configuration.	
M2 Parameter	DiagnosticExtract::Fim::DiagnosticFunctionIdentifierInhibit	
Mapping Rule	Mapping Type	
	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_FiM_00038]	

BSW Module	BSW Context	
FiM	FiM/FiMConfigSet/FiMIInhibitionConfiguration	
BSW Parameter	BSW Type	
FiMIInhEventRef	ECUC-REFERENCE-DEF	
BSW Description	Selection of an single DEM Event.	
Template Description	This represents the alias event applicable for the referencing inhibition source.	
M2 Parameter	DiagnosticExtract::Fim::DiagnosticFunctionInhibitSource.event	
Mapping Rule	Mapping Type	
1:1 mapping	full	
Mapping Status	ECUC Parameter ID	
valid	[ECUC_FiM_00100]	

BSW Module	BSW Context	
FiM	FiM/FiMConfigSet/FiMIInhibitionConfiguration	
BSW Parameter	BSW Type	
FiMIInhInhibitionMask	ECUC-ENUMERATION-PARAM-DEF	
BSW Description	The configuration parameter is used to specify the inhibition mask for an event - FID relation.	
Template Description	This represents the value of the inhibition mask behavior.	
M2 Parameter	DiagnosticExtract::Fim::DiagnosticFunctionIdentifierInhibit.inhibitionMask	
Mapping Rule	Mapping Type	





Mapping Status	full
valid	[ECUC_FiM_00096]

BSW Module	BSW Context
FiM	FiM/FiMConfigSet/FiMInhibitionConfiguration/FiMInhInhibitionMask
BSW Parameter	BSW Type
FIM_LAST_FAILED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Last Failed - DEM_UDS_STATUS_TF flag of Dem Eventstatus is set Use case: Re-configuration, avoiding follow-up errors	
Template Description	
This represents the inhibition mask behavior "last failed".	
M2 Parameter	
DiagnosticExtract::Fim::DiagnosticInhibitionMaskEnum. lastFailed	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
FiM	FiM/FiMConfigSet/FiMInhibitionConfiguration/FiMInhInhibitionMask
BSW Parameter	BSW Type
FIM_NOT_TESTED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Not Tested this cycle - DEM_UDS_STATUS_TNCTOC flag of Dem Eventstatus is set. Use case: Scheduling of monitors.	
Template Description	
This represents the inhibition mask behavior "not tested".	
M2 Parameter	
DiagnosticExtract::Fim::DiagnosticInhibitionMaskEnum. notTested	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
FiM	FiM/FiMConfigSet/FiMInhibitionConfiguration/FiMInhInhibitionMask
BSW Parameter	BSW Type
FIM_TESTED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Tested - DEM_UDS_STATUS_TNCTOC flag of Dem Eventstatus is not set. Use case: Self deactivation, check during driving cycle.	
Template Description	
This represents the inhibition mask behavior "tested".	
M2 Parameter	
DiagnosticExtract::Fim::DiagnosticInhibitionMaskEnum. tested	





Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
FIM	FiM/FiMConfigSet/FiMInhibitionConfiguration/FiMInhInhibitionMask
BSW Parameter	BSW Type
FIM_TESTED_AND_FAILED	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	Tested and Failed - DEM_UDS_STATUS_TF flag of Dem Eventstatus is set and DEM_UDS_STATUS_TNCTOC flag is not set Use case: Avoiding deadlocks, repeated monitoring.
Template Description	This represents the inhibition mask behavior "tested and failed".
M2 Parameter	DiagnosticExtract::Fim::DiagnosticInhibitionMaskEnum. testedAndFailed
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
FIM	FiM/FiMConfigSet
BSW Parameter	BSW Type
FiMSummaryEvent	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	The summarized EventId definition record consists of a summarized event ID and specific Dem Events. This record means that a particular FID that has to be disabled in case of summarized event (defined above) is to be disabled in any of the specific events. A possible solution could be assigning events as summarized events along with a list of specific events. During the configuration process the summarized event substitutes the referenced single events. However, it is not outlined how this requirement is solved - whether by configuration process or by implementation within the FIM. The FIM configuration tool could also build up a suitable data structure for summarized events and deal with it in the FIM implementation.
Template Description	This meta-class represents the ability to model a Fim event group, also known as a summary event in Fim terminology. This represents a group of single diagnostic events.
M2 Parameter	DiagnosticExtract::Fim::DiagnosticFimEventGroup
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_FiM_00603]

E.5 J1939 Dcm

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmChannel
BSW Parameter	BSW Type
J1939DcmBusType	ECUC-ENUMERATION-PARAM-DEF
BSW Description	
Identifies the communication port	
Template Description	
This represents the network ID for the J1939 cluster.	
M2 Parameter	
SystemTemplate::Fibex::Fibex4Can::CanTopology::J1939Cluster. networkId	
Mapping Rule	Mapping Type
value 1 maps to J1939DCM_J1939_NETWORK_1 value 2 maps to J1939DCM_J1939_NETWORK_2 value 3 maps to J1939DCM_J1939_NETWORK_3 value 4 maps to J1939DCM_J1939_NETWORK_4	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00039]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmDspExternalSRDataElementClass/J1939DcmDataElementInstance
BSW Parameter	BSW Type
J1939DcmDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	
Instance Reference to the primitive data which shall be read or written. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in ParameterInterfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationPrimitiveDataType of category VALUE or BOOLEAN or if the AutosarDataPrototype is typed with a ImplementationDataType of category VALUE or TYPE_REFERENCE that in turn boils down to VALUE	
Template Description	
This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.	
M2 Parameter	
DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping. mappedDataElement	
Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive data.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00067]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmDspExternalSRDataElementClass/J1939DcmSubElementInDataElementInstance
BSW Parameter	BSW Type
J1939DcmSubElementInDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	





Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationCompositeDataType.

Template Description

This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.mappedDataElement

Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00066]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmDspExternalSRDataElementClass/J1939DcmSubElementInImplDataElementInstance
BSW Parameter	BSW Type
J1939DcmSubElementInImplDataElementInstanceRef	ECUC-INSTANCE-REFERENCE-DEF

BSW Description

Instance Reference to the primitive sub-element (at any level) of composite data in a port which shall be read. Supported are VariableDataPrototypes in SenderReceiverInterfaces and NvDataInterfaces and ParameterDataPrototypes in Parameter Interfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ImplementationDataType of category STRUCTURE or ARRAY. Please note that in case of ARRAY the index attribute in the target reference has to be set to select a single array element.

Template Description

This represents the dataElement in the application software that is accessed for diagnostic purpose. This role is applicable on the classic platform.

M2 Parameter

DiagnosticExtract::ServiceMapping::DiagnosticServiceDataMapping.mappedDataElement

Mapping Rule	Mapping Type
DiagnosticServiceDataMapping maps to a primitive element within a composite data, where the AutosarDataPrototype is typed with a ApplicationCompositeDataType ImplementationDataType of category STRUCTURE or ARRAY.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00068]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmNode
BSW Parameter	BSW Type
J1939DcmServiceOnlyDTCsMemoryDestinationRef	ECUC-REFERENCE-DEF
BSW Description	Reference to the user defined memory used for the Service Only DTCs handled by DM53, DM54, and DM55.
Template Description	The event destination assigns events to none, one or multiple origins.
M2 Parameter	





DiagnosticExtract::Dem::DiagnosticTroubleCode::DiagnosticTroubleCodeProps.[memoryDestination](#)

Mapping Rule	Mapping Type
This upstream mapping shall only exist for a DiagnosticTroubleCodeJ1939 with attribute kind set to serviceOnly that references the DiagnosticTroubleCodeProps that owns the memoryDestination.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00051]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions
BSW Parameter	BSW Type
J1939DcmModeCondition	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration of a mode condition or an environmental conditions which can be used as argument in J1939DcmModeRules.	
One J1939DcmModeCondition shall contain either one J1939DcmSwcModeRef or one J1939DcmBswModeRef or one J1939DcmSwcSRDataElementRef.	
Please note that the J1939Dcm acts as well as mode manager. Therefore the references J1939DcmSwcModeRef or one J1939DcmBswModeRef might point to provided ModeDeclarationGroupPrototypes of the J1939Dcm itself as well as to provided ModeDeclarationGroupPrototypes of other Bsw Modules or software components.	
In case of a configured J1939DcmSwcModeRef or J1939DcmBswModeRef only the J1939DcmConditionType J1939DCM_EQUALS or J1939DCM_EQUALS_NOT are applicable.	
In case of J1939DcmSwcSRDataElementRef all literals of J1939DcmConditionType are possible.	
Template Description	
DiagnosticCompareConditions are atomic conditions. They are based on the idea of a comparison at runtime of some variable data with something constant. The type of the comparison (==, !=, <, <=, ...) is specified in DiagnosticCompareCondition.compareType.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition:: DiagnosticEnvCompareCondition	
Mapping Rule	Mapping Type
Depending on the reference a DcmModeCondition is mapped to a DiagnosticEnvModeCondition if only one reference is present and reference is a DcmSwcModeRef or a DcmBswModeRef. If two references are present, a DcmSwcSRDataElementRef and a DcmSwcSRDataElementValueRef, then DcmModeCondition is mapped to a DiagnosticEnvDataCondition.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00071]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition
BSW Parameter	BSW Type
J1939DcmBswModeRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	
This parameter references a mode of a ModeDeclarationGroupPrototype provided by a Basic Software Module used for the condition.	
Please note that such ModeDeclarationGroupPrototype are owned by a Basic Software Module Description in the role providedModeGroup.	
Template Description	





This reference represents both the ModeDeclarationGroupPrototype and the ModeDeclaration relevant for the mode comparison.

M2 Parameter

DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvModeCondition.[modeElement](#)

Mapping Rule	Mapping Type
For DcmModeRef a new DiagnosticEnvBswModeElement is used, pointing to the ModeDeclaration via ModelInModuleDescriptionInstanceRef. This new DiagnosticEnvModeElement shall be aggregated by the same DiagnosticEnvironmentalConfition as the DiagnosticEnvModeCondition, in which the target of the reference DiagnosticEnvModeCondition.modeElement points to the this DiagnosticEnvModeElement.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00059]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmConditionType
BSW Parameter	BSW Type
J1939DCM_EQUALS	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum isEqual: equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isEqual	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmConditionType
BSW Parameter	BSW Type
J1939DCM_EQUALS_NOT	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isNotEqual: not equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isNotEqual	
Mapping Rule	Mapping Type





1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmConditionType
BSW Parameter	BSW Type
J1939DCM_GREATER_OR_EQUAL	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isGreaterOrEqual: greater than or equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isGreaterOrEqual	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmConditionType
BSW Parameter	BSW Type
J1939DCM_GREATER_THAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isGreaterThan: greater than	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isGreaterThan	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmConditionType
BSW Parameter	BSW Type





J1939DCM_LESS_OR_EQUAL	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isLessOrEqual: less than or equal	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isLessOrEqual	
Mapping Rule	Mapping Type
	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmConditionType
BSW Parameter	
J1939DCM_LESS_THAN	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticCompareTypeEnum.isLessThan: less than	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticCompareTypeEnum. isLessThan	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition
BSW Parameter	
J1939DcmSwcModeRef	ECUC-INSTANCE-REFERENCE-DEF
BSW Description	
This parameter references a mode in a particular mode request port of a software component that is used for the condition.	
Template Description	
This reference represents both the ModeDeclarationGroupPrototype and the ModeDeclaration relevant for the mode comparison.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvModeCondition. modeElement	
Mapping Rule	Mapping Type





For DcmModeRef a new DiagnosticEnvSwcModeElement is used, pointing to the ModeDeclaration via PModelInSystemInstanceRef. This new DiagnosticEnvModeElement shall be aggregated by the same DiagnosticEnvironmentalCondition as the DiagnosticEnvModeCondition, in which the target of the reference DiagnosticEnvModeCondition.modeElement points to the this DiagnosticEnvMode Element.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00058]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition
BSW Parameter	BSW Type
J1939DcmSwcSRDataElementRef	ECUC-REFERENCE-DEF
BSW Description	
Reference to environmental conditions. It is possible to reference a S/R Receiver-Port to read physical values and compare (equal, greater, less,...) them with a configured value that is defined by J1939DcmSwcSRDataElementValue.	
Template Description	
This reference represents the related diagnostic data element.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. dataElement	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00060]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmSwcSRDataElementValue/J1939DcmSwcSRDataElementArray/J1939DcmSwcSRDataElementArrayElement
BSW Parameter	BSW Type
J1939DcmSwcSRDataElementArrayElementIndex	ECUC-INTEGER-PARAM-DEF
BSW Description	
Index to an array SR data element.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is an array.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00078]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/ J1939DcmSwcSRDataElementValue/J1939DcmSwcSRDataElementArray/J1939DcmSwcSRDataElementArrayElement
BSW Parameter	BSW Type
J1939DcmSwcSRDataElementArrayElementIndex	ECUC-INTEGER-PARAM-DEF
BSW Description	
Index to an array SR data element.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is an array.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00078]





BSW Parameter	BSW Type
J1939DcmSwcSRDataElementArrayElementValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Value of an array SR data element compare value.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is an array.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00079]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementValue/J1939DcmSwcSRDataElementPrimitive
BSW Parameter	BSW Type
J1939DcmSwcSRDataElementPrimitiveValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Reference to a primitive SR data element compare value.	
Template Description	
This attribute represents a fixed compare value taken to evaluate the compare condition.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvDataCondition. compareValue	
Mapping Rule	Mapping Type
DiagnosticDataElement referenced by the DiagnosticEnvDataCondition is primitive.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00077]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions
BSW Parameter	BSW Type
J1939DcmModeRule	ECUC-PARAM-CONF-CONTAINER-DEF
BSW Description	
This container contains the configuration of a mode rule which represents a logical expression with J1939DcmMode Conditions or other J1939DcmModeRules as arguments.	
All arguments are processed with the operator defined by DcmLogicalOperator, for instance: Argument_A AND Argument_B AND Argument_C	
Template Description	
A DiagnosticEnvConditionFormula embodies the computation instruction that is to be evaluated at runtime to determine if the DiagnosticEnvironmentalCondition is currently present (i.e. the formula is evaluated to true) or not (otherwise). The formula itself consists of parts which are combined by the logical operations specified by DiagnosticEnvConditionFormula.op.	
If a diagnostic functionality cannot be executed because an environmental condition fails then the diagnostic stack shall send a negative response code (NRC) back to the client. The value of the NRC is directly related to the specific formula and is therefore formalized in the attribute DiagnosticEnvConditionFormula.nrcValue.	





M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula	
Mapping Rule	Mapping Type
A DcmModeRule is mapped to a DiagnosticEnvConditionFormula, if this DcmModeRule is a subrule, i.e. it is referenced by a DcmArgumentRef. In addition, a new DiagnosticEnvironmentalCondition shall be created with DiagnosticEnvironmentalCondition.formula containing a DiagnosticEnvConditionFormula. In both cases, if no DcmLogicalOperator is present in this DcmModeRule, then DiagnosticEnvConditionFormula shall be set to DiagnosticLogicalOperatorEnum.logicalAnd.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00053]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeRule
BSW Parameter	BSW Type
J1939DcmArgumentRef	ECUC-CHOICE-REFERENCE-DEF
BSW Description	
This is a choice reference either to a mode condition or a an other mode rule serving as sub-expression.	
Template Description	
A DiagnosticEnvConditionFormulaPart can either be a atomic condition, e.g. a DiagnosticEnvCompareCondition, or a DiagnosticEnvConditionFormula, again, which allows arbitrary nesting.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormulaPart	
Mapping Rule	Mapping Type
Depending on the destination, one DcmArgumentRef is mapped to a DiagnosticEnvConditionFormula if "destination" is a DcmModeRule, and to a DiagnosticEnvCompareCondition, if "destination" is a DcmModeCondition. The order of the aggregation of the DiagnosticEnvConditionFormulaParts shall correspond to the ordering of the index of the DcmArgumentRefs.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_-00055]

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeRule/ J1939DcmLogicalOperator
BSW Parameter	BSW Type
J1939DCM_AND	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticLogicalOperatorEnum.logicalAnd: Logical AND	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticLogicalOperatorEnum. logicalAnd	
Mapping Rule	Mapping Type
1:1 mapping	full





Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeRule/ J1939DcmLogicalOperator
BSW Parameter	BSW Type
J1939DCM_OR	ECUC-ENUMERATION-LITERAL-DEF
BSW Description	
Template Description	
DiagnosticEnvConditionFormula.op: This attribute represents the concrete operator (supported operators: and, or) of the condition formula.	
DiagnosticLogicalOperatorEnum.logicalOr: Logical OR	
M2 Parameter	
DiagnosticExtract::Dom::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. op , Diagnostic Extract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticLogicalOperatorEnum. logicalOr	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	

BSW Module	BSW Context
J1939Dcm	J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeRule
BSW Parameter	BSW Type
J1939DcmModeRuleNrcValue	ECUC-INTEGER-PARAM-DEF
BSW Description	
Optional parameter which defines the NRC to be sent in case the mode rule condition is not valid.	
Template Description	
This attribute represents the concrete NRC value that shall be returned if the condition fails.	
M2 Parameter	
DiagnosticExtract::Dcm::DiagnosticService::EnvironmentalCondition::DiagnosticEnvConditionFormula. nrcValue	
Mapping Rule	Mapping Type
1:1 mapping	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_J1939Dcm_- 00056]

E.6 IdsM

BSW Module	BSW Context
IdsM	IdsM/IdsMConfiguration/IdsMEvent
BSW Parameter	BSW Type
IdsMSinkDem	ECUC-BOOLEAN-PARAM-DEF
BSW Description	





The QSEv will be sent to the Dem Module into a Security Event Memory (Sem) to persist it on the local ECU.

Template Description

This meta-class represents the ability to map a security event that is defined in the context of the Security Extract to a diagnostic event defined on the context of the DiagnosticExtract.

M2 Parameter

DiagnosticExtract::Dem::DiagnosticMapping::[DiagnosticEventToSecurityEventMapping](#)

Mapping Rule	Mapping Type
If the (M2) DiagnosticEventToSecurityEventMapping of the DEXT defines a mapping between the (M2) SecurityEventDefinition corresponding to the enclosing IdsMEvent and a (M2) Diagnostic Event, then IdsMSinkDem = TRUE. Otherwise, IdsMSinkDem = FALSE.	full
Mapping Status	ECUC Parameter ID
valid	[ECUC_IdsM_00035]

F Splitable Elements in the Scope of this Document

This chapter contains a table of all model elements stereotyped «atpSplitable» in the scope of this document.

Each entry in the table consists of the identification of the specific model element itself and the applicable value of the tagged value `atp.Splitkey`.

For more information about the concept of splitable model elements and how these shall be treated please refer to [24].

Name of splitable element	Splitkey
DiagnosticAging.agingCycle	agingCycle.diagnosticOperationCycle, agingCycle.variationPoint.shortLabel
DiagnosticContributionSet.commonProperties	commonProperties
DiagnosticContributionSet.element	element.diagnosticCommonElement, element.variationPoint.shortLabel
DiagnosticContributionSet.serviceTable	serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel
DiagnosticDataIdentifier.dataElement	dataElement.bitOffset, dataElement.variationPoint.shortLabel
DiagnosticEcuInstanceProps.ecuInstance	ecuInstance
DiagnosticEnableConditionGroup.enableCondition	enableCondition.diagnosticEnableCondition, enableCondition.variationPoint.shortLabel
DiagnosticEvent.connectedIndicator	connectedIndicator.shortName, connectedIndicator.variationPoint.shortLabel
DiagnosticInfoType.dataElement	dataElement.bitOffset, dataElement.variationPoint.shortLabel
DiagnosticIumprGroup.iumprGroupIdentifier	iumprGroupIdentifier, iumprGroupIdentifier.variationPoint.shortLabel
DiagnosticParameter.dataElement	dataElement.shortName, dataElement.variationPoint.shortLabel
DiagnosticParameterIdentifier.dataElement	dataElement.bitOffset, dataElement.variationPoint.shortLabel
DiagnosticProtocol.diagnosticConnection	diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel
DiagnosticProtocol.serviceTable	serviceTable.diagnosticServiceTable, serviceTable.variationPoint.shortLabel
DiagnosticSecurityAccess.securityLevel	securityLevel
DiagnosticServiceTable.diagnosticConnection	diagnosticConnection.diagnosticConnection, diagnosticConnection.variationPoint.shortLabel
DiagnosticStorageConditionGroup.storageCondition	storageCondition.diagnosticStorageCondition, storageCondition.variationPoint.shortLabel
DiagnosticTroubleCodeGroup.dtc	dtc.diagnosticTroubleCode, dtc.variationPoint.shortLabel
DiagnosticTroubleCodeObd.eventReadinessGroup	eventReadinessGroup, eventReadinessGroup.variationPoint.shortLabel
DiagnosticTroubleCodeProps.extendedDataRecord	extendedDataRecord.diagnosticExtendedDataRecord, extendedDataRecord.variationPoint.shortLabel
DiagnosticTroubleCodeProps.freezeFrame	freezeFrame.diagnosticFreezeFrame, freezeFrame.variationPoint.shortLabel

Table F.1: Usage of splitable elements

G Variation Points in the Scope of this Document

This chapter contains a table of all model elements stereotyped «atpVariation» in the scope of this document.

Each entry in the table consists of the identification of the model element itself and the applicable value of the tagged value `vh.latestBindingTime`.

For more information about the concept of variation points and how model elements that contain variation points shall be treated please refer to [24].

Variation Point	Latest Binding Time
DiagnosticAbstractDataIdentifier.id	preCompileTime
DiagnosticAging.agingCycle	preCompileTime
DiagnosticAging.threshold	preCompileTime
DiagnosticCommonProps	codeGenerationTime
DiagnosticConnectedIndicator.healingCycleCounterThreshold	preCompileTime
DiagnosticContributionSet.element	postBuild
DiagnosticContributionSet.serviceTable	postBuild
DiagnosticDataIdentifier.dataElement	postBuild
DiagnosticDebounceAlgorithmProps.debounceBehavior	preCompileTime
DiagnosticEnableConditionGroup.enableCondition	postBuild
DiagnosticEvent.confirmationThreshold	preCompileTime
DiagnosticEvent.connectedIndicator	postBuild
DiagnosticFreezeFrame.recordNumber	preCompileTime
DiagnosticIndicator.type	preCompileTime
DiagnosticIumprGroup.iumpGroupIdentifier	postBuild
DiagnosticMeasurementIdentifier.obdMid	preCompileTime
DiagnosticParameter.dataElement	postBuild
DiagnosticParameterIdentifier.dataElement	postBuild
DiagnosticProtocol.diagnosticConnection	postBuild
DiagnosticProtocol.priority	preCompileTime
DiagnosticProtocol.sendRespPendOnTransToBoot	preCompileTime
DiagnosticProtocol.serviceTable	postBuild
DiagnosticRoutine.id	preCompileTime
DiagnosticServiceTable.diagnosticConnection	postBuild
DiagnosticStorageConditionGroup.storageCondition	postBuild
DiagnosticTestIdIdentifier.id	preCompileTime
DiagnosticTestIdIdentifier.uasId	preCompileTime
DiagnosticTestResult.diagnosticEvent	preCompileTime
DiagnosticTestResult.updateKind	preCompileTime
DiagnosticTroubleCodeGroup.dtc	postBuild
DiagnosticTroubleCodeGroup.groupNumber	preCompileTime
DiagnosticTroubleCodeObd.considerPtoStatus	preCompileTime
DiagnosticTroubleCodeObd.eventReadinessGroup	postBuild



△

Variation Point	Latest Binding Time
DiagnosticTroubleCodeObd.obdDTCValue	preCompileTime
DiagnosticTroubleCodeProps.extendedDataRecord	preCompileTime
DiagnosticTroubleCodeProps.freezeFrame	preCompileTime
DiagnosticTroubleCodeProps.legislatedFreezeFrameContentWwhObd	preCompileTime
DiagnosticTroubleCodeProps.priority	preCompileTime
DiagnosticTroubleCodeProps.snapshotRecordContent	preCompileTime
DiagnosticTroubleCodeUds.udsDtcValue	preCompileTime
DiagnosticTroubleCodeUds.wwhObdDtcClass	preCompileTime

Table G.1: Usage of variation points