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△

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1 Introduction and Functional Overview

This specification specifies the functionality, API and the configuration of the AUTOSAR Basic Software module [J1939 Diagnostic Communication Manager](#).

1.1 Diagnostics according to SAE J1939

[SAE J1939-73](#) defines the message structures and behavior of so-called 'Diagnostic Messages' (DMs) which are used for diagnostic communication in [SAE J1939](#) networks.

Beside the communication when the vehicle is being repaired, it is also used during vehicle operation to report immediate diagnostic information into the vehicle like periodically broadcasting active [DTCs](#) to the instrument cluster to communicate to the driver status of the vehicle using different [lamp status](#).

2 Glossary, Acronyms, and Abbreviations

The glossary below includes terms and acronyms and abbreviations relevant to the [J1939Dcm](#) module that are not included in the [1, AUTOSAR Glossary].

Acronym / Abbreviation	Description
ACK	J1939 Acknowledgement PG (ACKM) with control byte set to 0, positive acknowledgement
ACKM	J1939 Acknowledgement PG (PGN = 0x0E800)
BAM	Broadcast Announce Message, broadcast variant of SAE J1939 transport layer
BSW	Basic Software (module)
BswM	Basic Software Mode Manager, see [2, SWS Basic Software Mode Manager]
CanIf	CAN Interface, see [3, SWS CAN Interface]
CDD	Complex Driver, any software that interfaces directly with AUTOSAR BSW , but is not defined by AUTOSAR, see [4, CDD Design And Integration Guideline] and [5, TPS ECU Configuration]
CMDT	Connection Mode Data Transfer, a.k.a. RTS/CTS, peer-to-peer variant of SAE J1939 transport layer
ComM	Communication Manager, [6, SWS Communication Manager]
DA	Destination Address, part of the 29 bit identifier of SAE J1939 messages
DEM	Diagnostic Event Manager, stores DTCs containing diagnostic events and test results, and associated information, see [7, SWS Diagnostic Event Manager]
DET	Default Error Tracer, supports development and runtime error reporting, see [8, SWS Default Error Tracer]
DM	SAE J1939 Diagnostic Message defined in SAE J1939-73 , many of these consisting of the Lamp Status and a variable number of DTCs
DP	Data Page, the most significant bit (MSB) of the 18 bit PGN
DTC	Diagnostic Trouble Code, transmitted inside a diagnostic message and containing the source of the problem (SPN), the kind of the problem (FMI), and an occurrence counter (OC)
EcuM	ECU State Manager, see [9, SWS ECU State Manager]
EDP	Extended Data Page, the second bit (after MSB) of the 18 bit PGN
FMI	Failure Mode Indicator, identifying the problem with an SPN in a DTC
J1939Dcm	SAE J1939 Diagnostic Communication Manager (this module)
J1939Nm	SAE J1939 Network Management , see [10, SWS SAE J1939 Network Management]
J1939Rm	SAE J1939 Request Manager , see [11, SWS SAE J1939 Request Manager]
J1939Tp	SAE J1939 Transport Layer , see [12, SWS SAE J1939 Transport Layer]
LampStatus	The Lamp Status contains information about the severity of active errors, transmitted as part of diagnostic messages
MetaData	Meta data transferred alongside a PDU, consisting of a set of meta data items
MetaDataType	A single item of meta data of defined type and size
NACK	J1939 Acknowledgement PG (ACKM) with control byte set to 1, negative acknowledgement
OC	Occurrence Counter, counting how often a problem with an SPN occurred since the last reset of a DTC
Parameter	Parameter, SAE J1939 term for a signal, including defined scale, limits, offset, and physical unit
PDU	Protocol Data Unit, a message transferred between the layers of the AUTOSAR stack, also known as I-PDU
PDU1	J1939 PDU Type 1 , this kind of PG can be sent to a specific destination address
PDU2	J1939 PDU Type 2 , this kind of PG can only be sent as broadcast





Acronym / Abbreviation	Description
PDUF	PDU Format, the middle byte of the 18 bit PGN which identifies the PG and determines the layout (PDU1/PDU2) of the PGN
PduR	PDU Router, see [13, SWS PDU Router]
PDUS	PDU Specific, the lower byte of the 18 bit PGN which further identifies PDU2 PG which do not have a destination address
PG	Parameter Group, SAE J1939 term for a specific message layout
PGN	Parameter Group Number, unique identifier (18 bits: EDP, DP, PDUF, PDUS) of an SAE J1939 Parameter Group that is contained in the payload of many J1939 protocol messages and in the 29bit CAN identifier of SAE J1939 messages.
PRI	Priority, part of the 29 bit identifier of SAE J1939 messages
RQST	J1939 Request PG (PGN = 0x0EA00)
RTE	AUTOSAR Runtime Environment, see [14, SWS RTE]
SA	Source Address, part of the 29 bit identifier of SAE J1939 messages
SAE	Society of Automotive Engineers (in charge of J1939 specification)
SAE J1939	Serial control and communications standard for heavy duty vehicle networks created by the SAE, see [15, SAE J1939]
SAE J1939-21	Data link layer for CAN 2.0 created by the SAE, see [16, SAE J1939-21]
SAE J1939-73	Diagnostics application layer created by the SAE, see [17, SAE J1939-73]
SchM	Basic Software Schedule Manager, part of the RTE
Service SW-C	Service Software Component, the SW-C that represents the BSW module
SNA	Signal Not Available, all bits set to 1 in SAE J1939 PGs/Parameters
SPN	Suspect Parameter Number, unique identifier of an SAE J1939 Parameter
SW-C	AUTOSAR Software Component (of the Application)

3 Related Documentation

3.1 Input Documents & Related Standards and Norms

- [1] Glossary
AUTOSAR_FO_TR_Glossary
- [2] Specification of Basic Software Mode Manager
AUTOSAR_CP_SWS_BSWModeManager
- [3] Specification of CAN Interface
AUTOSAR_CP_SWS_CANInterface
- [4] Complex Driver design and integration guideline
AUTOSAR_CP_EXP_CDDDesignAndIntegrationGuideline
- [5] Specification of ECU Configuration
AUTOSAR_CP_TPS_ECUConfiguration
- [6] Specification of Communication Manager
AUTOSAR_CP_SWS_COMManager
- [7] Specification of Diagnostic Event Manager
AUTOSAR_CP_SWS_DiagnosticEventManager
- [8] Specification of Default Error Tracer
AUTOSAR_CP_SWS_DefaultErrorTracer
- [9] Specification of ECU State Manager
AUTOSAR_CP_SWS_ECUCStateManager
- [10] Specification of Network Management for SAE J1939
AUTOSAR_CP_SWS_SAEJ1939NetworkManagement
- [11] Specification of a Request Manager for SAE J1939
AUTOSAR_CP_SWS_SAEJ1939RequestManager
- [12] Specification of a Transport Layer for SAE J1939
AUTOSAR_CP_SWS_SAEJ1939TransportLayer
- [13] Specification of PDU Router
AUTOSAR_CP_SWS_PDURouter
- [14] Specification of RTE Software
AUTOSAR_CP_SWS_RTE
- [15] SAE J1939 – Serial Control and Communications Heavy Duty Vehicle Network
- [16] SAE J1939-21 Data Link Layer
- [17] SAE J1939-73 Application Layer – Diagnostics
- [18] General Specification of Basic Software Modules

AUTOSAR_CP_SWS_BSWGeneral

- [19] Layered Software Architecture
AUTOSAR_CP_EXP_LayeredSoftwareArchitecture
- [20] Requirements on Diagnostics
AUTOSAR_FO_RS_Diagnostics
- [21] General Requirements on Basic Software Modules
AUTOSAR_CP_RS_BSWGeneral
- [22] Specification of Communication Stack Types
AUTOSAR_CP_SWS_CommunicationStackTypes
- [23] Specification of Standard Types
AUTOSAR_CP_SWS_StandardTypes
- [24] System Template
AUTOSAR_CP_TPS_SystemTemplate

3.2 Related Specifications

AUTOSAR provides a General Specification on [Basic Software](#) modules [18, SWS BSW General], which is also valid for [SAE J1939 Diagnostic Communication Manager](#).

Thus, the specification [18, SWS BSW General] shall be considered as additional and required specification for [SAE J1939 Diagnostic Communication Manager](#).

4 Constraints and Assumptions

4.1 Limitations

The [J1939 Diagnostic Communication Manager](#) implements only the subset of 'Diagnostic Messages' defined in [[SWS_J1939Dcm_00238](#)].

The [DM13](#) does not support "Suspend Signal" and "Suspend Duration".

[NACK](#) is not provided for received [DMx](#) messages that are not supported or not configured. This restriction mainly affects handling of [DM07](#) and [DM13](#).

4.2 Applicability to Automotive Domains

[J1939](#) is developed by the [SAE](#) as a standard for heavy duty on-highway, farming, and construction vehicles. It is not applicable to passenger cars or light trucks. The [J1939 Diagnostic Communication Manager](#) will mainly be used in heavy duty on-highway vehicles.

5 Dependencies to Other Modules

The [19, EXP Layered Software Architecture] shows an overview of the neighboring modules of the [J1939 Diagnostic Communication Manager](#).

The [J1939 Diagnostic Communication Manager](#) module (J1939Dcm) has direct interfaces and/or configuration dependencies towards the [Diagnostic Event Manager](#) (DEM), the [PDU Router](#) (PduR), the [J1939 Request Manager](#) (J1939Rm), the [Basic Software Mode Manager](#) (BswM), the [ECU State Manager](#) (EcuM), and the [Default Error Tracer](#) (DET), and also to application software components (SW-Cs) via the [AUTOSAR Runtime Environment](#) (RTE and to [Complex Drivers](#) (CDD). Besides these, there are also indirect dependencies towards the [Communication Manager](#) (ComM), the [J1939 Transport Layer](#) (J1939Tp), and the [CAN Interface](#) (CanIf). See also [Figure 5.1](#).

The [J1939 Diagnostic Communication Manager](#) module includes header files of the [Diagnostic Event Manager](#), the [PDU Router](#), the [Basic Software Mode Manager](#), the [J1939 Request Manager](#), and the [Default Error Tracer](#).

5.1 File Structure

5.1.1 Code File Structure

For details, refer to the subsection 5.1.6 “Code file structure” of the [18, SWS BSW General].

5.1.2 Header File Structure

For details, refer to the subsection 5.1.7 “Header file structure” of the [18, SWS BSW General].

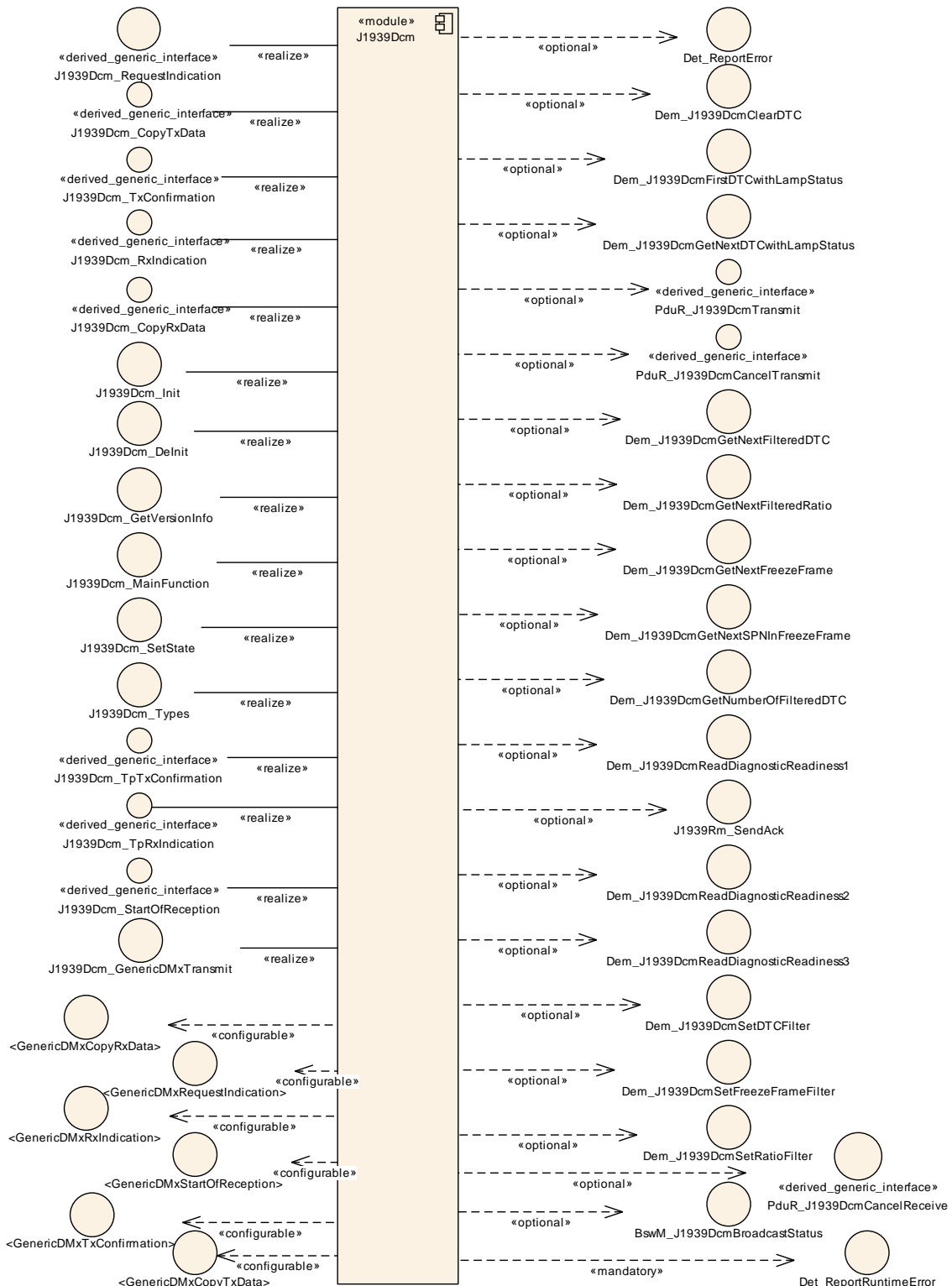


Figure 5.1: Module Dependencies of the J1939Dcm Module

6 Requirements Tracing

The following tables reference the requirements specified in [20, RS Diagnostics] (Requirements on Diagnostics) and [21, SRS BSW General] and links to the fulfillment of these.

Requirement	Description	Satisfied by
[RS_Diag_04112]	The DEM module shall support DTCs according to SAE J1939	[SWS_J1939Dcm_00048] [SWS_J1939Dcm_00049] [SWS_J1939Dcm_00177] [SWS_J1939Dcm_00178] [SWS_J1939Dcm_00179] [SWS_J1939Dcm_00180] [SWS_J1939Dcm_00181] [SWS_J1939Dcm_00182] [SWS_J1939Dcm_00183] [SWS_J1939Dcm_00184] [SWS_J1939Dcm_00197]
[RS_Diag_04113]	Support a set of SAE J1939 DM-messages	[SWS_J1939Dcm_00209] [SWS_J1939Dcm_00238]
[RS_Diag_04241]	Support for unsupported SAE J1939 DM-messages	[SWS_J1939Dcm_00204] [SWS_J1939Dcm_00205] [SWS_J1939Dcm_00206] [SWS_J1939Dcm_00207] [SWS_J1939Dcm_00208] [SWS_J1939Dcm_91001] [SWS_J1939Dcm_91002] [SWS_J1939Dcm_91003] [SWS_J1939Dcm_91004] [SWS_J1939Dcm_91005] [SWS_J1939Dcm_91006] [SWS_J1939Dcm_91007]

Table 6.1: Requirements Tracing

7 Functional Specification

This chapter defines the behavior of the [J1939 Diagnostic Communication Manager](#). The API of the module is defined in [Chapter 8](#), while the configuration is defined in [Chapter 10](#).

7.1 Overview

The [J1939 Diagnostic Communication Manager](#) is responsible to process the diagnostic `request` messages and the sending of the appropriate response `ACKM PGs`.

7.1.1 Supported Diagnostic Messages

[SWS_J1939Dcm_00209]

Upstream requirements: [RS_Diag_04113](#)

[The [J1939 Diagnostic Communication Manager](#) shall support the diagnostic messages (DMx) shown in [\[SWS_J1939Dcm_00238\]](#).]

[SWS_J1939Dcm_00238] Supported DMx Messages

Upstream requirements: [RS_Diag_04113](#)

[

Name	PGN (Hexadecimal)	Size	Received	Transmitted	Description
DM01	FECA	Var.	-	Cyclic 1s	Active Diagnostic Trouble Codes
DM02	FECB	Var.	-	On Request	Previously Active Diagnostic Trouble Codes
DM03	FECC	-	-	On Request	Diagnostic Data Clear/Reset for Previously Active DTCs
DM04	FECD	Var.	-	On Request	Freeze Frame Parameters
DM05	FECE	8	-	On Request	Diagnostic Readiness 1
DM06	FECF	Var.	-	On Request	Emission Related Pending DTCs
DM11	FED3	-	-	On Request	Diagnostic Data Clear/Reset for Active DTCs
DM12	FED4	Var.	-	On Request	Emissions Related Active DTCs
DM13	DF00	8	X	-	Stop Start Broadcast
DM19	D300	Var.	-	On Request	Calibration Information
DM20	C200	Var.	-	On Request	Monitor Performance Ratio SAE J1939-73 Revised SEP2006
DM21	C100	8	-	On Request	Diagnostic Readiness 2



△

Name	PGN (Hexadecimal)	Size	Received	Transmitted	Description
DM23	FDB5	Var.	-	On Request	Previously Active Emission Related Faults
DM24	FDB6	8	-	On Request	SPN Support
DM25	FDB7	Var.	-	On Request	Expanded Freeze Frame
DM26	FDB8	Var.	-	On Request	Diagnostic Readiness 3
DM28	FD80	Var.	-	On Request	Permanent DTCs
DM29	9E00	8	-	On Request	Regulated DTC Counts (Pending, Permanent, MIL-On, PMIL-On)
DM31	A300	Var.	-	On Request	DTC to Lamp Association
DM35	9F00	Var.	-	On Request	Immediate Fault Status
DM53	FCD1	Var.	-	On Request	Active Service Only DTCs
DM54	FCD2	Var.	-	On Request	Previously Active Service Only DTCs
DM55	FCD3	Var.	-	On Request	Diagnostic Data Clear/Reset for all Service Only DTCs

]

[SWS_J1939Dcm_00204]

Upstream requirements: [RS_Diag_04241](#)

[If [J1939DcmGenericDMxSupport](#) is enabled, [Requests](#) for [DMx](#) messages that are not listed in [\[SWS_J1939Dcm_00238\]](#) shall be forwarded via the callout configured as [J1939DcmGenericDMxRequestFunction](#). They can be answered using [J1939Dcm_GenericDMxTransmit](#), which will trigger the callbacks configured via [J1939DcmGenericDMxCopyTxDataFunction](#) and [J1939DcmGenericDMxTxConfirmationFunction](#).]

[SWS_J1939Dcm_00205]

Upstream requirements: [RS_Diag_04241](#)

[If [J1939DcmGenericDMxSupport](#) is enabled, received [DMx](#) messages that are not listed in [\[SWS_J1939Dcm_00238\]](#) shall be forwarded to the application using the callbacks configured via [J1939DcmGenericDMxStartOfReceptionFunction](#), [J1939DcmGenericDMxCopyRxDataFunction](#), and [J1939DcmGenericDMxRxIndicationFunction](#).]

[SWS_J1939Dcm_00193] [[DMx](#) message with variable size are exchanged with the [J1939Tp](#), using the TP API ([PduR_J1939DcmTransmit](#), [J1939Dcm_CopyTxData](#), [J1939Dcm_TpTxConfirmation](#) for transmission and [J1939Dcm_StartOfReception](#), [J1939Dcm_CopyRxData](#), [J1939Dcm_TpRxIndication](#) for reception). [DMx](#) message with a fixed size of 8 bytes are exchanged with the [CanIf](#), using the IF API ([PduR_J1939DcmTransmit](#), [J1939Dcm_TxConfirmation](#) for transmission and [J1939Dcm_RxIndication](#) for reception).]

7.2 Module Handling

This section contains description of auxiliary functionality of the [J1939 Diagnostic Communication Manager](#).

7.2.1 Initialization

The [J1939 Diagnostic Communication Manager](#) is initialized via [J1939Dcm_Init](#), and de-initialized via [J1939Dcm_DeInit](#). Except for [J1939Dcm_GetVersionInfo](#) and [J1939Dcm_Init](#), the API functions of the [J1939 Diagnostic Communication Manager](#) may only be called when the module has been properly initialized.

[SWS_J1939Dcm_00002] [A call to [J1939Dcm_Init](#) initializes all internal variables and sets the [J1939 Diagnostic Communication Manager](#) to the initialized state.]

[SWS_J1939Dcm_00003] [A call to [J1939Dcm_DeInit](#) sets the [J1939 Diagnostic Communication Manager](#) back to the uninitialized state.]

[SWS_J1939Dcm_00005] [When [J1939Dcm_Init](#) is called in initialized state, the [J1939 Diagnostic Communication Manager](#) shall not re-initialize its internal variables. It shall instead call [Det_ReportError](#) with the error code [J1939DCM_E_REINIT](#) if [DET](#) reporting is enabled (see [J1939DcmDevErrorDetect](#)).]

7.2.2 Error Handling

[SWS_J1939Dcm_00089] [On errors and exceptions, the [J1939Dcm](#) module shall not modify its current module state but shall simply report the error event.]

7.3 Message Processing

7.3.1 Reception of Requests

The [J1939 Diagnostic Communication Manager](#) receives most requests for the [DMx PGs](#) via [J1939Dcm_RequestIndication](#) from the [J1939 Request Manager](#). Exceptions are the command messages (marked in “received” column in [\[SWS_J1939Dcm_00238\]](#)).

[SWS_J1939Dcm_00091] [The configured `DMx` messages in `J1939Dcm` shall match the `J1939RmUserRequestPgn` configured for a `J1939RmDcmUser` in `J1939Rm`.]

[SWS_J1939Dcm_00006] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_RequestIndication` shall check if the `requestedPgn` parameter addresses a configured `DMx` message (`J1939DcmDiagnosticMessageSupport` and the corresponding `PGN` could be found in **[SWS_J1939Dcm_00238]** in table column “PGN (Hexadecimal)”). In case of an error, the function `J1939Dcm_RequestIndication` shall return without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PGN`.]

[SWS_J1939Dcm_00007] [When `J1939Dcm_RequestIndication` is called and the requested `diagnostic message` is supported (configured via `DMx` specific configuration switch in container `J1939DcmDiagnosticMessageSupport`); the `J1939 Diagnostic Communication Manager` shall, except for `DM01` and `DM35` messages, lock the common buffer (of **[SWS_J1939Dcm_00115]**) and start to process it with next execution of `J1939Dcm_MainFunction`.]

See **Section 7.7.1** for `DM01` and **Section 7.7.20** for `DM35` handling.

Note: A `NACK` by `J1939Dcm_RequestIndication` will not be called because the `J1939Rm` will send the `NACK` for not supported `DMx` messages due to **[SWS_J1939Dcm_00091]**.

[SWS_J1939Dcm_00173] [If the newly received `Diagnostic Message` is not allowed in the current mode condition (according to the configuration parameter `J1939DcmDiagnosticMessageModeRuleRef`), the `J1939Dcm` shall ignore the current `request`.]

[SWS_J1939Dcm_00115] [The `J1939Dcm` shall provide a buffer in size of `J1939DcmCommonBufferSize` for the common `DMx` message processing including a semaphore to lock the buffer to prevent a multiple usage of this buffer.]

[SWS_J1939Dcm_00008] [When `J1939Dcm_RequestIndication` is called and any other `diagnostic message` (apart from `DM01` and `DM35`) is currently processed, the `J1939 Diagnostic Communication Manager` shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_CANNOT_RESPOND` to send a `negative acknowledgement` (considering **[SWS_J1939Dcm_00113]**).]

`SAE J1939` diagnostics do not require positive or negative `acknowledgement` after request to the global address.

[SWS_J1939Dcm_00113] [When `J1939Dcm_RequestIndication` is called with `destination address` (`destAddress`) is set to the global address (0xFF), the `J1939Dcm` shall not call `J1939Rm_SendAck` to send an `acknowledgement`.]

7.3.2 Failed Message Transmission

[SWS_J1939Dcm_00197]

Upstream requirements: [RS_Diag_04112](#)

[When `PduR_J1939DcmTransmit` returns anything but `E_OK`, or when `J1939Dcm_TpTxConfirmation` or `J1939Dcm_TxConfirmation` reports `E_NOT_OK`, the `J1939Dcm` shall retry the failed transmission from the next main function up to `J1939DcmMaxTransmitRetries` times.]

7.3.3 Termination of Message

[SWS_J1939Dcm_00009] [For messages sent via TP (“Size” in the table in [\[SWS_J1939Dcm_00238\]](#) is “variable”), the transmission is terminated when `J1939Dcm_TpTxConfirmation` is called after transmission of a requested message which has been accepted and processed according to [\[SWS_J1939Dcm_00007\]](#), the `J1939 Diagnostic Communication Manager` shall then release the buffer of [\[SWS_J1939Dcm_00115\]](#).]

[SWS_J1939Dcm_00164] [For messages sent via IF (“Size” in the table in [\[SWS_J1939Dcm_00238\]](#) is 8), the transmission is terminated when `J1939Dcm_TxConfirmation` is called after transmission of a requested message which has been accepted and processed according to [\[SWS_J1939Dcm_00007\]](#). The `J1939 Diagnostic Communication Manager` shall then release the buffer of [\[SWS_J1939Dcm_00115\]](#).]

7.3.4 Handling of Meta Data

[SWS_J1939Dcm_00194] [Meta data items of type `CAN_ID_32` contain the `source address` in the fourth (least significant) byte.]

[SWS_J1939Dcm_00195] [Meta data items of type `CAN_ID_32` contain the `destination address` in the third byte.]

[SWS_J1939Dcm_00196] [Meta data items of type `CAN_ID_32` contain the `priority` in the bits 2-4 of the first (most significant) byte, where bit 0 is the least significant bit of a byte.]

7.4 Communication State Handling

In general, diagnostics is only active and available when the ECU is set to to online by `J1939Nm`. The `J1939 Diagnostic Communication Manager` provides an API that is used by the `BSW Mode Manager (BswM)` to notify the `J1939` communication state.

[SWS_J1939Dcm_00125] [During initialization via `J1939Dcm_Init`, the `J1939 Diagnostic Communication Manager` assumes the offline state.]

[SWS_J1939Dcm_00126] [A call to `J1939Dcm_SetState` sets the `J1939 Diagnostic Communication Manager` to online or offline state.]

[SWS_J1939Dcm_00127] [In the offline state, the `J1939 Diagnostic Communication Manager` shall not progress any periodic messages.]

Note: The `J1939Rm` does not forward any request message to `J1939Dcm` when it assumes `J1939RM_STATE_OFFLINE`.

7.5 Mode Dependent Request Execution

The execution of a `request` can be limited depending on mode condition. This enables the `J1939Dcm` to formalize environmental checks.

[SWS_J1939Dcm_00168] [The `J1939DcmModeRule` shall evaluate all referenced `J1939DcmModeConditions` and/or nested `J1939DcmModeRules` either by a logical AND in case `J1939DcmLogicalOperator` is set to `J1939DCM_AND` or by a logical OR in case the `J1939DcmLogicalOperator` is set to `J1939DCM_OR`. In case only a single `J1939DcmModeCondition` or `J1939DcmModeRule` is referenced, the `J1939DcmLogicalOperator` shall not be present and therefore not be used.]

[SWS_J1939Dcm_CONSTR_06201] [`J1939DcmModeCondition` shall have either a `J1939DcmBswModeRef` or a `J1939DcmSwcModeRef` or a `J1939DcmSwcSRDataElementRef` as external reference.]

[SWS_J1939Dcm_00169] [The `J1939DcmSwcModeRef` and `J1939DcmBswModeRef` of `J1939DcmModeConditions` shall evaluate if the referenced Mode-Declaration is set in case of `J1939DcmConditionType` is set to `J1939DCM_EQUALS` or is not set in case of `J1939DcmConditionType` is set to `J1939DCM_EQUALS_NOT`.]

[SWS_J1939Dcm_00170] [The `J1939DcmSwcSRDataElementRef` of `J1939DcmModeCondition` shall be evaluated if the referenced data element (by `J1939DcmDspExternalSRDataElementClass`)

- is equal to the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_EQUALS`,
- is unequal to the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_EQUALS_NOT`,
- is greater than the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_GREATER_THAN`,
- is greater than or equal to the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_GREATER_OR_EQUAL`,
- is less than the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_LESS_THAN`,
- is less than or equal to the value represented by the `J1939DcmSwcSRDataElementValue` in case of `J1939DcmConditionType` is set to `J1939DCM_LESS_OR_EQUAL`.

]

[SWS_J1939Dcm_CONSTR_06202] [The values `J1939DCM_GREATER_THAN`, `J1939DCM_GREATER_OR_EQUAL`, `J1939DCM_LESS_OR_EQUAL`, and `J1939DCM_LESS_THAN` shall not be used with a Mode reference (`J1939DcmBswModeRef` or `J1939DcmSwcModeRef`).]

Note: The current mode of the referenced `ModeDeclarationGroupPrototypes` could be read by either the API `SchM_Mode` (in case of `J1939DcmBswModeRef`) or by the API `Rte_Mode` (in case of `J1939DcmSwcModeRef`).

[SWS_J1939Dcm_00171] [In case multiple `J1939DcmModeConditions` are referenced within a `J1939DcmModeRule`, they shall be evaluated in order of the index attributes of the `EcucReferenceValues` for `J1939DcmArgumentRef`.]

[SWS_J1939Dcm_00172] [The J1939Dcm shall create for commonly used ModeDeclarationGroupPrototype of each J1939DcmSwcModeRef of J1939DcmModeConditions a required mode switch port referencing this ModeDeclarationGroupPrototype. The name pattern of this port prototype shall be “J1939DcmModeUser_<ModeDeclarationGroupPrototype>” in case the ModeDeclarationGroupPrototype short name is unique. Otherwise, the name pattern is implementation specific, except the required prefix “J1939DcmModeUser_”.]

Note: ModeDeclarationGroupPrototypes are not necessarily unique, wherefore the exception is required to avoid name clashes in the J1939Dcm Service SWC.

7.6 J1939Dcm - DEM Interaction

Many diagnostic messages report DTC information from Diagnostic Event Manager. Most of these messages are structured identically, wherefore the same API sequences are used.

[SWS_J1939Dcm_00133] [The J1939Dcm shall ensure that access to the DEM is strictly serialized, i.e. that only one DEM sequence is executed in parallel.]

Note: This is implicitly achieved by locking the global buffer (see [SWS_J1939Dcm_00007]) for all diagnostic messages apart from DM01, DM03, DM11, and DM35. Thus, the implementation must take care that DM01, DM03, DM11, and DM35 execution does not start while the global buffer is locked, and vice versa.

7.6.1 DTC Status

[SWS_J1939Dcm_00236] Filter Criteria for Diagnostic Messages [

Diagnostic message		Dem_J1939DcmSetDTCFilter Parameters		
		DTCStatusFilter	DTCKind	DTCOrigin
DM01	Active Diagnostic Trouble Codes	DEM_J1939DTC_-ACTIVE	DEM_DTC_KIND_ALL_-DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM02	Previously Active Diagnostic Trouble Codes	DEM_J1939DTC_-PREVIOUSLY_ACTIVE	DEM_DTC_KIND_ALL_-DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM06	Emission Related Pending DTCs	DEM_J1939DTC_-PENDING	DEM_DTC_KIND_-EMISSION_REL_DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM12	Emissions Related Active DTCs	DEM_J1939DTC_-ACTIVE	DEM_DTC_KIND_-EMISSION_REL_DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM23	Previously Active Emission Related Faults	DEM_J1939DTC_-PREVIOUSLY_ACTIVE	DEM_DTC_KIND_-EMISSION_REL_DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM28	Permanent DTCs	DEM_J1939DTC_-PERMANENT	DEM_DTC_KIND_-EMISSION_REL_DTCs	DEM_DTC_ORIGIN_-PRIMARY_MEMORY





Diagnostic message		Dem_J1939DcmSetDTCFilter Parameters		
		DTCStatusFilter	DTCKind	DTCOrigin
DM35	Immediate Fault Status	DEM_J1939DTC_-CURRENTLY_ACTIVE	DEM_DTC_KIND_ALL_-DTCS	DEM_DTC_ORIGIN_-PRIMARY_MEMORY
DM53	Active Service Only DTCs	DEM_J1939DTC_-ACTIVE	DEM_DTC_KIND_ALL_-DTCS	Origin definition from J1939DcmServiceOnly DTCsMemory DestinationRef
DM54	Previously Active Service Only DTCs	DEM_J1939DTC_-PREVIOUSLY_ACTIVE	DEM_DTC_KIND_ALL_-DTCS	Origin definition from J1939DcmServiceOnly DTCsMemory DestinationRef

]

[SWS_J1939Dcm_00010] [On start of DTC status sequence, the J1939 Diagnostic Communication Manager shall call the Dem_J1939DcmSetDTCFilter with the parameters DTCStatusFilter and DTCKind defined by the DMx message that triggered the sequence, as well as the assigned ClientId of the requested node.]

[SWS_J1939Dcm_00011] [In case the Dem_J1939DcmSetRatioFilter, Dem_J1939DcmSetDTCFilter, or Dem_J1939DcmSetFreezeFrameFilter returns E_OK, the values in parameter LampStatus shall be encoded into the response message layout according to SAE J1939-73.

The high byte is the Byte 1 in the response message. The low byte is the Byte 2 of the response message.]

Note: The bit-structure of parameter LampStatus is already structured according SAE J1939-73 by DEM module, wherefore no rearrangement is required by J1939Dcm.

[SWS_J1939Dcm_00012] [In case the Dem_J1939DcmSetRatioFilter, Dem_J1939DcmSetDTCFilter, or Dem_J1939DcmSetFreezeFrameFilter returns E_NOT_OK, the J1939 Diagnostic Communication Manager shall call J1939Rm_SendAck with parameter ackCode set to J1939RM_ACK_NEGATIVE to send a negative acknowledgement (NACK) (considering [SWS_J1939Dcm_00113]).]

The J1939 Diagnostic Communication Manager shall continue the sequence by subsequent calling the Dem_J1939DcmGetNextFilteredDTC, till the returned value is DEM_NO_SUCH_ELEMENT.

The calls may be distributed over several calls of J1939Dcm_MainFunction.

[SWS_J1939Dcm_00014] [If the returned value is E_OK, the parameters J1939DTC and OccurrenceCounter shall be copied to the response message defined by the DMx message that triggered the sequence.]

[SWS_J1939Dcm_00015] [The [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextFilteredDTC`, except the maximum sequence counter threshold per MainFunction is reached (see [J1939DcmMaxDTCsPerMainFunction](#)) or the returned value is `DEM_PENDING`. In this case, the execution is postponed to the next [J1939Dcm_MainFunction](#) call.]

[SWS_J1939Dcm_00016] [If the returned value is `DEM_NO_SUCH_ELEMENT`, the [J1939 Diagnostic Communication Manager](#) shall call `PduR_J1939DcmTransmit` with the `PduId` of the requested message and set the destination address (via `MetaData`) according to the source address of the request, or to `0xFF` when the destination of the request was `0xFF`, or to `0xFF` (broadcast) for spontaneous `DM01` messages.]

Note: In case the same `DTC` needs to be reported from different nodes, each node would require its own `EventId`.

7.6.2 FreezeFrame

[SWS_J1939Dcm_00017] [On start of FreezeFrame sequence, the [J1939 Diagnostic Communication Manager](#) shall call the `Dem_J1939DcmSetFreezeFrameFilter` with the parameter `FreezeFrameKind` defined by the `DMx` message that triggered the sequence, as well as the assigned `ClientId` of the requested node.]

[SWS_J1939Dcm_00018] [In case the `Dem_J1939DcmSetRatioFilter`, `Dem_J1939DcmSetDTCFilter`, or `Dem_J1939DcmSetFreezeFrameFilter` returns `E_NOT_OK`, the [J1939 Diagnostic Communication Manager](#) shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a negative acknowledgement (NACK) (considering [\[SWS_J1939Dcm_00113\]](#)).]

7.6.2.1 FreezeFrameKind equals `DEM_J1939DCM_FREEZEFRAME` or `DEM_J1939DCM_EXPANDED_FREEZEFRAME`

This `FreezeFrameKind` is used by [DM04](#) and [DM25](#).

[SWS_J1939Dcm_00201] [In case the `Dem_J1939DcmSetRatioFilter`, `Dem_J1939DcmSetDTCFilter`, or `Dem_J1939DcmSetFreezeFrameFilter` returns `E_OK` and the `FreezeFrameKind` is set to `DEM_J1939DCM_FREEZEFRAME` or

DEM_J1939DCM_EXPANDED_FREEZEFRAME, the [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextFreezeFrame`, till the returned value is `DEM_NO_SUCH_ELEMENT`.

The calls may spread over several calls of [J1939Dcm_MainFunction](#).]

[SWS_J1939Dcm_00020] [If the returned value is `E_OK` and the `FreezeFrameKind` is set to `DEM_J1939DCM_FREEZEFRAME` or `DEM_J1939DCM_EXPANDED_FREEZEFRAME`, the parameters `BufSize`, `DestBuffer`, `J1939DTC` and `OccurenceCounter` shall be encoded into the response message layout according to [SAE J1939-73](#).]

[SWS_J1939Dcm_00021] [The [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextFreezeFrame`, except the maximum sequence counter threshold per `MainFunction` is reached (see [J1939DcmMaxFreezeFramesPerMainFunction](#)) or the returned value is `DEM_PENDING`.]

[SWS_J1939Dcm_00022] [If the returned value is `DEM_NO_SUCH_ELEMENT` and the `FreezeFrameKind` is set to `DEM_J1939DCM_FREEZEFRAME` or `DEM_J1939DCM_EXPANDED_FREEZEFRAME` the [J1939 Diagnostic Communication Manager](#) shall trigger `PduR_J1939DcmTransmit` with the `PduId` of the requested message and set the `destination address` (via `MetaData`) according to the `source address` of the `request`, or to `0xFF` when the `destination` of the `request` was `0xFF`.]

7.6.2.2 FreezeFrameKind equals DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME

This `FreezeFrameKind` is used by [DM24](#).

[SWS_J1939Dcm_00202] [In case the `Dem_J1939DcmSetRatioFilter`, `Dem_J1939DcmSetDTCFilter`, or `Dem_J1939DcmSetFreezeFrameFilter` returns `E_OK` and the `FreezeFrameKind` is set to `DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME`, the [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextSPNInFreezeFrame`, till the returned value is `DEM_NO_SUCH_ELEMENT`.

The calls may spread over several calls of [J1939Dcm_MainFunction](#).]

[SWS_J1939Dcm_00094] [If the returned value is `E_OK` and the `FreezeFrameKind` is set to `DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME`, the parameter “SPN-Supported” and “SPNDataLength” shall be encoded into the response message layout according to [SAE J1939-73](#) and the bit 1 “Supported in Expanded Freeze Frame” in “SPN support type” shall be set to 0.]

[SWS_J1939Dcm_00095] [In addition to [\[SWS_J1939Dcm_00094\]](#) the bit 2 “Supported in Data Stream” in “SPN support type” shall be set to 0 in case the `SPN` is also contained in the list of configuration parameters `J1939DcmSPNsInDataStream`.]

[SWS_J1939Dcm_00096] [If the returned value is `DEM_NO_SUCH_ELEMENT` and the `FreezeFrameKind` is set to `DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME` the `J1939 Diagnostic Communication Manager` shall add to the response message all `SPNs` which are only supported in `J1939DcmSPNsInDataStream` and not in the `ExpandedFreezeFrame` (returned by [\[SWS_J1939Dcm_00094\]](#)).

The bit 2 “Supported in Data Stream” in “SPN support type” shall be set to 0 and the “SPN Data Length” shall be set to 0x00.

Afterwards `PduR_J1939DcmTransmit` shall be triggered with the `PduId` of the requested message and set the `destination address` (via `MetaData`) according to the `source address` of the `request`, or to 0xFF when the `destination` of the `request` was 0xFF.]

[SWS_J1939Dcm_00165] [If the returned value is `DEM_BUFFER_TOO_SMALL`, the `J1939Dcm` shall report this error to the `Default Error Tracer` with the error code `J1939DCM_E_BUFFER_TOO_SMALL`, and shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a `negative acknowledgement` (NACK) (considering [\[SWS_J1939Dcm_00113\]](#)).]

7.6.3 Ratio

[SWS_J1939Dcm_00023] [On start of Ratio sequence, the `J1939 Diagnostic Communication Manager` shall call the `Dem_J1939DcmSetRatioFilter` with the assigned `ClientId` of the requested `node`.]

[SWS_J1939Dcm_00024] [In case the `Dem_J1939DcmSetRatioFilter`, `Dem_J1939DcmSetDTCFilter`, or `Dem_J1939DcmSetFreezeFrameFilter` returns `E_OK`, the values in parameter `IgnitionCycleCounter` and `OBDMonitoringConditionsEncountered` shall be encoded into the response message layout according to [SAE J1939-73](#).]

[SWS_J1939Dcm_00025] [In case the `Dem_J1939DcmSetRatioFilter`, `Dem_J1939DcmSetDTCFilter`, or `Dem_J1939DcmSetFreezeFrameFilter` returns `E_NOT_OK`, the [J1939 Diagnostic Communication Manager](#) shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a [negative acknowledgement \(NACK\)](#) (considering [\[SWS_J1939Dcm_00113\]](#)).

[SWS_J1939Dcm_00203] [The [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextFilteredRatio`, till the returned value is `DEM_NO_SUCH_ELEMENT`.

The calls may spread over several calls of [J1939Dcm_MainFunction](#).

[SWS_J1939Dcm_00027] [If the returned value is `E_OK`, the parameters `SPN`, `Numerator`, and `Denominator` shall be copied to the response message defined by the [DMx](#) message that triggered the sequence.]

[SWS_J1939Dcm_00028] [The [J1939 Diagnostic Communication Manager](#) shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextFilteredRatio`, except the maximum sequence counter threshold per `MainFunction` is reached (see [J1939DcmMaxRatiosPerMainFunction](#)) or the returned value is `DEM_PENDING`.]

[SWS_J1939Dcm_00029] [If the returned value is `DEM_NO_SUCH_ELEMENT`, the [J1939 Diagnostic Communication Manager](#) shall call `PduR_J1939DcmTransmit` with the `PduId` of the requested message and set the [destination address](#) (via `MetaData`) according to the [source address](#) of the request, or to `0xFF` when the [destination](#) of the request was `0xFF`.]

7.6.4 Service Only DTCs

[J1939](#) has the concept of “Service only DTCs”. These [DTCs](#) are considered to be stored in any of the user defined fault memories of the [DEM](#) (`Dem_DTCOriginType` with `DEM_DTC_ORIGIN_USERDEFINED_MEMORY_<Name>`). All other [DTCs](#) are considered to be stored in the primary fault memory (`Dem_DTCOriginType` with `DEM_DTC_ORIGIN_PRIMARY_MEMORY`).

[SWS_J1939Dcm_00177]

Upstream requirements: [RS_Diag_04112](#)

[While processing [DM53](#), [DM54](#), or [DM55](#), the [J1939Dcm](#) shall call the [DEM APIs](#) [Dem_J1939DcmClearDTC](#) and [Dem_J1939DcmSetDTCFilter](#) with the [Dem_DTCOriginType](#) corresponding to the [DemUserDefinedMemory](#) referenced by [J1939DcmServiceOnlyDTCsMemoryDestinationRef](#).]

[J1939Dcm/DEM](#) interaction in the [J1939Dcm](#):

[SWS_J1939Dcm_CONSTR_06203] [The [J1939DcmServiceOnlyDTCsMemoryDestinationRef](#) shall reference an event memory assigned to the [DemEventMemorySet](#) of the current [J1939DcmDemClientRef](#).]

7.7 Diagnostic Messages

7.7.1 Active Diagnostic Trouble Codes (DM01)

The [DM01](#) is used to broadcast periodically and on change the active [DTCs](#) and the summarized [lamp status](#) of this ECU.

[SWS_J1939Dcm_00030] [On reception of [request](#) for [DM01](#) (call of [J1939Dcm_RequestIndication](#) with parameter [requestedPgn](#) set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)), the [J1939 Diagnostic Communication Manager](#) shall lock the dedicated [DM01](#) buffer (see [\[SWS_J1939Dcm_00114\]](#)) and use the common “DTC status” sequence with the parameters [DTCStatusFilter](#) and [DTCKind](#) set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

7.7.1.1 Periodic Collection and Transmission of the DM01 Message

[SWS_J1939Dcm_00031] [The [J1939 Diagnostic Communication Manager](#) shall lock the dedicated [DM01](#) buffer (see [\[SWS_J1939Dcm_00114\]](#)), collect all active [DTCs](#) and the [lamp status](#) in this buffer according to [SAE J1939-73](#), and transmit the [DM01](#) message with a period of $1s$ as defined by [\[SWS_J1939Dcm_00032\]](#), [\[SWS_J1939Dcm_00033\]](#), [\[SWS_J1939Dcm_00034\]](#), and [\[SWS_J1939Dcm_00114\]](#).]

[SWS_J1939Dcm_00114] [The `J1939Dcm` shall provide a buffer in size of `J1939DcmDM01BufferSize` for the parallel `DM01` processing to support [\[SWS_J1939Dcm_00031\]](#).]

[SWS_J1939Dcm_00032] [When `DEM` calls `J1939Dcm_DemTriggerOnDTCStatus`, the `DM01` message shall be transmitted (additionally to the regular periodic transmission) for the corresponding `J1939DcmNmNodeRef` of the reported `ClientId` for all configured channels, except `J1939Dcm_DemTriggerOnDTCStatus` for the same `DTC` is triggered more than once per second. The separate `DM01` buffer (see [\[SWS_J1939Dcm_00114\]](#)) shall be used.]

Note: The exception prevents a too high busload.

[SWS_J1939Dcm_00033] [The `DM01` shall use for all configured `DM01` messages (`J1939DcmDmxSupport == J1939DCM_DM01_SUPPORT`) on all nodes (`J1939DcmNode`) and on all channels (`J1939DcmDiagnosticMessageSupportChannelRef`) the common “DTC status” sequence with the parameters `DTCStatusFilter` and `DTCKind` set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

Note: The periodic `DM01` messages is broadcast on all configured networks for all configured nodes.

Example: Node_A will transmit periodically `DTC_A` and `DTC_B` on `channel_1` and `channel_2`, but node_B will only transmit `DTC_C` on `channel_2`.

The requested `DM01` message is only transmitted on the requested `channel` for the requested `node`.

[SWS_J1939Dcm_00034] [The return values `J1939DTC` and `OccurenceCounter` shall be encoded into the `DM01` layout according to [SAE J1939-73](#).]

To enable the ECU to use `BAM` for anything else than cyclic `DM01` transmission, the maximum number of `DTCs` shall be restricted. 20 `DTCs` require about 2/3 of the available bandwidth of `BAM`.

[SWS_J1939Dcm_00116] [After transmission of configured `DTCs` in parameter `J1939DcmDM01MaxDTCs` the transmission shall be stopped.]

Note: The transmit request to `PduR` is covered by the common “DTC status” sequence described in [Section 7.6.1](#).

7.7.2 Previously Active Diagnostic Trouble Codes (DM02)

The **DM02** message reports previously active **DTCs**.

[SWS_J1939Dcm_00035] [On reception of **request** for **DM02** (call of **J1939Dcm_RequestIndication** with parameter **requestedPgn** set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the **J1939 Diagnostic Communication Manager** shall use the common “DTC status” sequence with the parameters **DTCStatusFilter** and **DTCKind** set according to the corresponding table columns in **[SWS_J1939Dcm_00236]**.]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00036] [The return values **J1939DTC** and **OccurrenceCounter** shall be encoded into the **DM02** layout according to [SAE J1939-73](#).]

7.7.3 Diagnostic Data Clear/Reset for Previously Active DTCs (DM03)

The **DM03** message clears previously active **DTCs**.

[SWS_J1939Dcm_00037] [On reception of **request** for **DM03** (call of **J1939Dcm_RequestIndication** with parameter **requestedPgn** set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the **J1939 Diagnostic Communication Manager** shall trigger **Dem_J1939DcmClearDTC** with parameter **DTCTypeFilter** set to **DEM_J1939DTC_CLEAR_PREVIOUSLY_ACTIVE**.]

[SWS_J1939Dcm_00038] [If the return value of the function **Dem_J1939DcmClearDTC** is **DEM_PENDING**, the **J1939 Diagnostic Communication Manager** shall retrigger **Dem_J1939DcmClearDTC** (with parameter **DTCTypeFilter** set to **DEM_J1939DTC_CLEAR_PREVIOUSLY_ACTIVE**) in the next call of **J1939Dcm_MainFunction**.]

[SWS_J1939Dcm_00039] [If the return value of the function **Dem_J1939DcmClearDTC** is **E_OK**, the **J1939 Diagnostic Communication Manager** shall send a **positive acknowledgement (ACK)** by **J1939Rm_SendAck** with parameter **ackCode** set to **J1939RM_ACK_POSITIVE**.]

[SWS_J1939Dcm_00040] [If return value **Std_ReturnType** is other than **E_OK** or **DEM_PENDING**, the **J1939 Diagnostic Communication Manager** shall send a **negative acknowledgement (NACK)** by **J1939Rm_SendAck** with parameter **ackCode** set to **J1939RM_ACK_NEGATIVE**.]

Note: In case the `destination address` of the `request` was broadcast (0xFF), no `acknowledgement` shall be send according to SAE J1939-73 (refer [SWS_J1939Dcm_00113]).

7.7.4 Freeze Frame Parameters (DM04)

The DM04 message reports the stored FreezeFrame(s).

[SWS_J1939Dcm_00041] [On reception of `request` for DM04 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [SWS_J1939Dcm_00238]) the `J1939 Diagnostic Communication Manager` shall use the common “FreezeFrame” sequence with the parameter `FreezeFrameKind` set to `DEM_J1939DCM_FREEZEFRAME`.]

The common “FreezeFrame” sequence is described in [Section 7.6.2](#).

7.7.5 Diagnostic Readiness 1 (DM05)

The DM05 message reports the diagnostic readiness.

[SWS_J1939Dcm_00042] [On reception of `request` for DM05 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [SWS_J1939Dcm_00238]) the `J1939 Diagnostic Communication Manager` shall call `Dem_J1939DcmReadDiagnosticReadiness1` with the assigned `ClientId` of the requested `node` latest on next `J1939Dcm_MainFunction`.]

[SWS_J1939Dcm_00043] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness1` is `E_OK`, the return parameter `DataValue` shall be encoded into the DM05 layout according to SAE J1939-73.

Afterwards `PduR_J1939DcmTransmit` with the `PduId` of the requested message shall be called with the `destination address` (via `MetaData`) set according to the `source address` of the `request`, or to 0xFF when the `destination` of the `request` was 0xFF.]

[SWS_J1939Dcm_00045] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness1` is unequal `E_OK`, the `J1939 Diagnostic Communication Manager` shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a `negative acknowledgement` (NACK) (considering [SWS_J1939Dcm_00113]).]

7.7.6 Emission Related Pending DTCs (DM06)

The **DM06** message reports OBD-relevant pending **DTCs**.

[SWS_J1939Dcm_00046] [On reception of `request` for **DM06** (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the **J1939 Diagnostic Communication Manager** shall use the common “DTC status” sequence with the parameters `DTCStatusFilter` and `DTCKind` set according to the corresponding table columns in **[SWS_J1939Dcm_00236]**.]

The common “DTC status” sequence is described in **Section 7.6.1**.

[SWS_J1939Dcm_00047] [The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the **DM06** layout according to **SAE J1939-73**.]

7.7.7 Diagnostic Data Clear/Reset for Active DTCs (DM11)

The **DM11** message should at least clear all applicable diagnostic data pertaining to active **DTCs** (further affected diagnostic data refer **SAE J1939-73**).

[SWS_J1939Dcm_00048]

Upstream requirements: **RS_Diag_04112**

[On reception of `request` for **DM11** (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the **J1939 Diagnostic Communication Manager** shall trigger `Dem_J1939DcmClearDTC` with parameter `DTCTypeFilter` set to `DEM_J1939DTC_CLEAR_ACTIVE`.]

[SWS_J1939Dcm_00049]

Upstream requirements: **RS_Diag_04112**

[If return value of the function `Dem_J1939DcmClearDTC` is `DEM_PENDING`, the **J1939 Diagnostic Communication Manager** shall retrigger `Dem_J1939DcmClearDTC` (with parameter `DTCTypeFilter` set to `DEM_J1939DTC_CLEAR_ACTIVE`) in the next call of `J1939Dcm_MainFunction`.]

[SWS_J1939Dcm_00050] [If the return value of the function `Dem_J1939DcmClearDTC` is `E_OK`, the **J1939 Diagnostic Communication Manager** shall send a **positive acknowledgement (ACK)** by `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_POSITIVE`.]

[SWS_J1939Dcm_00051] [If return value of the function `Dem_J1939DcmClearDTC` is other than `E_OK`, the `J1939 Diagnostic Communication Manager` shall send a `negative acknowledgement (NACK)` by `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE`.]

Note: In case the `destination address` of the `request` was broadcast (`0xFF`), no `acknowledgement` shall be sent according to `SAE J1939-73` (refer [\[SWS_J1939Dcm_00113\]](#)).

7.7.8 Emissions Related Active DTCs (DM12)

The `DM12` message reports OBD-relevant active `DTCs`.

[SWS_J1939Dcm_00052] [On reception of request for `DM12` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “DTC status” sequence with the parameters `DTCStatusFilter` and `DTCKind` set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00053] [The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the `DM12` layout according to `SAE J1939-73`.]

7.7.9 Stop Start Broadcast (DM13)

The `DM13` message stops and starts the broadcast of messages to certain networks.

The following networks are available:

- J1587
- J1922
- J1939 Network #1, Primary vehicle network
- J1939 Network #2
- ISO 9141
- J1850
- Other, Manufacture Specified Port
- SAE J1939 Network #3

- Proprietary Network #1
- Proprietary Network #2
- J1939 Network #4

See also [J1939DcmBusType](#).

[SWS_J1939Dcm_00129] [The [J1939Dcm](#) shall maintain the broadcast status information of the [DM13](#) command message. The initial value of the broadcast status information is the normal broadcasting mode for all networks.]

[SWS_J1939Dcm_00054] [On reception of [DM13](#) command message via call of [J1939Dcm_RxIndication](#) with parameter [RxPduId](#) set to the configured [J1939DcmRxPduId](#) and the hold signal set to [not available](#), the [J1939 Diagnostic Communication Manager](#) shall start timeout supervision and call [BswM_J1939DcmBroadcastStatus](#) with the updated broadcast status information; see also [\[SWS_J1939Dcm_00055\]](#), [\[SWS_J1939Dcm_00056\]](#), [\[SWS_J1939Dcm_00057\]](#), and [\[SWS_J1939Dcm_00058\]](#).]

[SWS_J1939Dcm_00055] [For network “Current Data Link”, the corresponding [ComMChannelId](#) of received [DM13](#) command message determines the network bit reported to [BswM](#).]

[SWS_J1939Dcm_00092] [For other bus types in the [DM13](#) command message, if there is an adequate [J1939DcmBusType](#) the corresponding referenced [ComMChannelId](#) of [J1939DcmComMChannelRef](#) shall represent the network bit in the [NetworkMask](#) reported to [BswM](#). Otherwise the request is ignored.]

[SWS_J1939Dcm_00056] [A “Stop Broadcast” shall result in a 0 in the bit associated with the network in the broadcast status information provided to [BswM](#).]

[SWS_J1939Dcm_00057] [A “Start Broadcast” shall result in a 1 in the bit associated with the network in the broadcast status information provided to [BswM](#).]

[SWS_J1939Dcm_00058] [A “Don’t Care/take no action (leave as is)” in the bit associated with the network in the broadcast status information shall not update the [J1939Dcm](#) internal broadcast status information.]

[SWS_J1939Dcm_00134] [On reception of [DM13](#) command message via call of [J1939Dcm_RxIndication](#) with parameter [RxPduId](#) set to the configured [J1939DcmRxPduId](#) and the hold signal set to “all devices” or to “devices whose broadcast state has been modified”, the [J1939 Diagnostic Communication Manager](#) shall restart timeout supervision.]

Note: Timeout supervision is only started when the node has been addressed as described by [SWS_J1939Dcm_00054]. When the node was not addressed by a DM13 message without hold signal, it will therefore not be affected by the hold signal “devices whose broadcast state has been modified”.

[SWS_J1939Dcm_00135] [When timeout occurs after 6 seconds without another DM13 message, all buses shall be set back to broadcast mode by calling `BswM_J1939DcmBroadcastStatus` with a broadcast status information where all buses are set to 1.]

Note: It's up to the application to use the broadcast state reported to `BswM` in order to avoid setting diagnostic trouble codes because some signals were not received in time.

7.7.10 Calibration Information (DM19)

The DM19 message reports the Calibration Verification Number.

[SWS_J1939Dcm_00059] [On reception of `request` for DM19 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [SWS_J1939Dcm_00238]) the J1939 Diagnostic Communication Manager shall trigger the operation `GetCalibrationVerificationNumber` of port prototype `J1939Dcm_CalibrationInformation` to collect the CVN.]

[SWS_J1939Dcm_00060] [If the returned value is `E_NOT_READY`, the J1939 Diagnostic Communication Manager shall send the acknowledgement by `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_CANNOT_RESPOND` (considering [SWS_J1939Dcm_00113]).]

[SWS_J1939Dcm_00210] [If the returned value is `E_NOT_OK`, the J1939 Diagnostic Communication Manager shall ignore the return parameters and report “CalibrationVerificationNumber” with zeros (0x00) and “CalibrationID” with high values (i.e. 0xFF) according to SAE J1939-73.

Afterwards, `PduR_J1939DcmTransmit` with the `PduId` of the requested message shall be triggered and set the `destination address` (via `MetaData`) according to the `source address` of the `request`, or to 0xFF when the `destination` of the `request` was 0xFF.]

Note: Some regulations require that the last computed value be stored and reported while a current cycle calculation is underway. For this case, the application needs to store the last calculated CVN(s).

[SWS_J1939Dcm_00061] [If the returned value is `E_NEXT`, the `J1939 Diagnostic Communication Manager` shall encode the return parameter “CalibrationVerificationNumber” and “CalibrationID” into the DM19 layout according to [SAE J1939-73](#). Afterwards the operation `GetCalibrationVerificationNumber` of port prototype `J1939Dcm_CalibrationInformation` shall be re-triggered to collect the next part of the CVN.]

[SWS_J1939Dcm_00062] [If the returned value is `E_OK`, the `J1939 Diagnostic Communication Manager` shall encode the return parameter `CalibrationVerificationNumber` and `CalibrationID` into the DM19 layout according to [SAE J1939-73](#).

Afterwards, `PduR_J1939DcmTransmit` with the `PduId` of the requested message shall be triggered and set the `destination address` (via `MetaData`) according to the `source address` of the `request`, or to `0xFF` when the `destination` of the `request` was `0xFF`.]

7.7.11 Monitor Performance Ratio (DM20)

The DM20 message reports the In-Use-Monitor Performance Ratio (IUMPR).

[SWS_J1939Dcm_00063] [On reception of request for DM20 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “Ratio” sequence.]

The common “Ratio” sequence is described in [Section 7.6.3](#).

7.7.12 Diagnostic Readiness 2 (DM21)

The DM21 message reports the diagnostic readiness.

[SWS_J1939Dcm_00064] [On reception of `request` for DM21 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall call `Dem_J1939DcmReadDiagnosticReadiness2` with the assigned `ClientId` of the requested `node` latest on next `J1939Dcm_MainFunction` cycle.]

[SWS_J1939Dcm_00065] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness2` is `E_OK`, the return parameter `DataValue` shall be encoded into the DM21 layout according to [SAE J1939-73](#).

Afterwards `PduR_J1939DcmTransmit` with the `PduId` of `DM21` shall be triggered and the `destination address` shall be set (via `MetaData`) to the `source address` of the `request`, or to `0xFF` when the `destination` of the `request` was `0xFF`.]

[SWS_J1939Dcm_00067] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness2` is unequal `E_OK`, the `J1939 Diagnostic Communication Manager` shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a `negative acknowledgement (NACK)` (considering [\[SWS_J1939Dcm_00113\]](#)).]

7.7.13 Previously Active Emission Related Faults (DM23)

The `DM23` message reports OBD-relevant previously-active `DTCs`.

[SWS_J1939Dcm_00068] [On reception of `request` for `DM23` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “DTC status” sequence with the parameters `DTCStatusFilter` and `DTCKind` set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00069] [The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the `DM23` layout according to [SAE J1939-73](#).]

7.7.14 SPN Support (DM24)

The `DM24` message reports supported `SPNs` of `DM25` and `DataStream`.

[SWS_J1939Dcm_00118] [On reception of `request` for `DM24` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “FreezeFrame” sequence with the parameter `FreezeFrameKind` set to `DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZE-FRAME`.]

The common “FreezeFrame” sequence is described in [Section 7.6.2](#).

7.7.15 Expanded Freeze Frame (DM25)

The DM25 reports the data of the expanded Freeze Frame

[SWS_J1939Dcm_00117] [On reception of `request` for DM25 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the J1939 Diagnostic Communication Manager shall use the common “FreezeFrame” sequence with the parameter `FreezeFrameKind` set to `DEM_J1939DCM_EXPANDED_FREEZEFRAME`.]

The common “FreezeFrame” sequence is described in [Section 7.6.2](#).

7.7.16 Diagnostic Readiness 3 (DM26)

The DM26 message reports the diagnostic readiness.

[SWS_J1939Dcm_00070] [On reception of `request` for DM26 (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in **[SWS_J1939Dcm_00238]**) the J1939 Diagnostic Communication Manager shall call `Dem_J1939DcmReadDiagnosticReadiness3` with the assigned `ClientId` of the requested `node` latest on next `J1939Dcm_MainFunction` cycle.]

[SWS_J1939Dcm_00071] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness3` is `E_OK`, the return parameter `DataValue` shall be encoded into the DM26 layout according to [SAE J1939-73](#).

Afterwards `PduR_J1939DcmTransmit` with the `PduId` of DM26 shall be triggered and the `destination address` (via `MetaData`) set according to the `source address` of the `request`, or to `0xFF` when the `destination` of the `request` was `0xFF`.]

[SWS_J1939Dcm_00073] [If the return value of `Dem_J1939DcmReadDiagnosticReadiness3` is unequal `E_OK`, the J1939 Diagnostic Communication Manager shall call `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE` to send a `negative acknowledgement (NACK)` (considering **[SWS_J1939Dcm_00113]**).]

7.7.17 Permanent DTCs (DM28)

The DM28 message reports OBD-relevant permanent DTCs.

[SWS_J1939Dcm_00074] [On reception of `request` for `DM28` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “DTC status” sequence with the parameters `DTCStatusFilter` and `DTCKind` set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00075] [The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the `DM28` layout according to [SAE J1939-73](#).]

7.7.18 Regulated DTC Counts (DM29)

The `DM29` message reports the count of `DTCs` in each category.

[SWS_J1939Dcm_00076] [On reception of `request` for `DM29` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall call for each byte in the response message the `Dem_J1939DcmSetDTCFilter` with the parameters `DTCStatusFilter` and `DTCKind` as defined in [\[SWS_J1939Dcm_00237\]](#).]

[SWS_J1939Dcm_00237] Response Message Structure of DM29 [

Byte Position	Counting	Dem_J1939DcmSetDTCFilter Parameters	
		DTCStatusFilter	DTCKind
Byte 1	Pending DTCs	DEM_J1939DTC_PENDING	DEM_DTC_KIND_-EMISSION_REL_DTCS
Byte 2	All Pending DTCs	DEM_J1939DTC_PENDING	DEM_DTC_KIND_ALL_DTCS
Byte 3	MIL-On DTCs	DEM_J1939DTC_ACTIVE	DEM_DTC_KIND_-EMISSION_REL_DTCS
Byte 4	Previously MIL-On DTCs	DEM_J1939DTC_-PREVIOUSLY_ACTIVE	DEM_DTC_KIND_-EMISSION_REL_DTCS
Byte 5	Permanent DTCs	DEM_J1939DTC_-PERMANENT	DEM_DTC_KIND_-EMISSION_REL_DTCS
Byte 6	0xFF		
Byte 7	0xFF		
Byte 8	0xFF		

]

[SWS_J1939Dcm_00077] [After each call of `Dem_J1939DcmSetDTCFilter`, the `J1939 Diagnostic Communication Manager` shall call `Dem_J1939DcmGetNumberOfFilteredDTC` to get the current count of matching DTCs.]

[SWS_J1939Dcm_00078] [If the returned value is `E_OK`, the `J1939 Diagnostic Communication Manager` shall copy the value returned in parameter `NumberOfFilteredDTC` to the corresponding byte in the response message of `DM29`.]

[SWS_J1939Dcm_00079] [If the returned value is `DEM_PENDING`, the `J1939 Diagnostic Communication Manager` shall re-trigger `Dem_J1939DcmGetNumberOfFilteredDTC` in the next call of `J1939Dcm_MainFunction`.

The unused bytes 6 to 8 shall be set to `0xFF`.]

7.7.19 DTC to Lamp Association (DM31)

The `DM31` message reports `DTC` to `Lamp Association`.

[SWS_J1939Dcm_00080] [On reception of `request` for `DM31` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall call the function `Dem_J1939DcmFirstDTCwithLampStatus` to start the data streaming.]

[SWS_J1939Dcm_00120] [The `J1939 Diagnostic Communication Manager` shall continue the sequence by subsequent calling the `Dem_J1939DcmGetNextDTCwithLampStatus`, except the maximum sequence counter threshold per `MainFunction` is reached (see [J1939DcmMaxDTCsPerMainFunction](#)) or the returned value is `DEM_PENDING`. In this case, the execution is postponed to the next `J1939Dcm_MainFunction` call.]

[SWS_J1939Dcm_00081] [The return values `J1939DTC`, `OccurrenceCounter` and `LampStatus` of each function call `Dem_J1939DcmGetNextDTCwithLampStatus` shall be subsequently encoded into the `DM31` layout according to [SAE J1939-73](#).]

[SWS_J1939Dcm_00121] [If the returned value is `DEM_NO_SUCH_ELEMENT` the `J1939 Diagnostic Communication Manager` shall call `PduR_J1939DcmTransmit` with the `PduId` of the requested message and set the `destination address` (via `MetaData`) according to the `source address` of the `request`, or to `0xFF` when the `destination` of the `request` was `0xFF`.]

7.7.20 Immediate Fault Status (DM35)

The [DM35](#) message reports the immediate fault status.

[SWS_J1939Dcm_00082] [On reception of [request](#) for [DM35](#) (call of [J1939Dcm_RequestIndication](#) with parameter [requestedPgn](#) set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the [J1939 Diagnostic Communication Manager](#) shall start to collect all immediate [DTCs](#) and the summarized [lamp status](#) using the separate [DM35](#) buffer (see [\[SWS_J1939Dcm_00200\]](#)) and transmit the [DM35](#) message with a period of [1s](#) until module shutdown.]

Note: AUTOSAR has chosen the option to transmit this message only once per second.

[SWS_J1939Dcm_00200] [The [J1939Dcm](#) shall provide a buffer in size of [J1939DcmDM35BufferSize](#) for the parallel [DM35](#) processing to support [\[SWS_J1939Dcm_00082\]](#).]

[SWS_J1939Dcm_00083] [The [DM35](#) shall use the common “DTC status” sequence with the parameters [DTCStatusFilter](#) and [DTCKind](#) set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00084] [The return values [J1939DTC](#) and [OccurenceCounter](#) shall be encoded into the [DM35](#) layout according to [SAE J1939-73](#).]

7.7.21 Active Service Only DTCs (DM53)

The [DM53](#) message reports active service only [DTCs](#).

[SWS_J1939Dcm_00178]

Upstream requirements: [RS_Diag_04112](#)

[On reception of [request](#) for [DM53](#) (call of [J1939Dcm_RequestIndication](#) with parameter [requestedPgn](#) set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the [J1939 Diagnostic Communication Manager](#) shall use the common “DTC status” sequence with the parameters [DTCStatusFilter](#), [DTCOrigin](#), and [DTCKind](#) set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00179]

Upstream requirements: [RS_Diag_04112](#)

[The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the `DM53` layout according to [SAE J1939-73](#).]

7.7.22 Previously Active Service Only DTCs (DM54)

The `DM54` message reports previously active service only `DTCs`.

[SWS_J1939Dcm_00180]

Upstream requirements: [RS_Diag_04112](#)

[On reception of `request` for `DM54` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall use the common “DTC status” sequence with the parameters `DTCStatusFilter`, `DTCOrigin`, and `DTCKind` set according to the corresponding table columns in [\[SWS_J1939Dcm_00236\]](#).]

The common “DTC status” sequence is described in [Section 7.6.1](#).

[SWS_J1939Dcm_00181]

Upstream requirements: [RS_Diag_04112](#)

[The return values `J1939DTC` and `OccurrenceCounter` shall be encoded into the `DM54` layout according to [SAE J1939-73](#).]

7.7.23 Diagnostic Data Clear/Reset for all Service Only DTCs (DM55)

The `DM55` message clears all service only `DTCs`.

[SWS_J1939Dcm_00182]

Upstream requirements: [RS_Diag_04112](#)

[On reception of `request` for `DM55` (call of `J1939Dcm_RequestIndication` with parameter `requestedPgn` set according to table column “PGN (Hexadecimal)” in [\[SWS_J1939Dcm_00238\]](#)) the `J1939 Diagnostic Communication Manager` shall trigger `Dem_J1939DcmClearDTC` with parameter `DTCTypeFilter` set to `DEM_J1939DTC_CLEAR_ACTIVE_AND_PREVIOUSLY_ACTIVE` and `DTCOrigin` set to definition from [J1939DcmServiceOnlyDTCsMemoryDestinationRef](#).]

[SWS_J1939Dcm_00183]

Upstream requirements: [RS_Diag_04112](#)

[If the return value of the function `Dem_J1939DcmClearDTC` is `DEM_PENDING`, the [J1939 Diagnostic Communication Manager](#) shall retrigger `Dem_J1939DcmClearDTC` (with parameter `DTCTypeFilter` set to `DEM_J1939DTC_CLEAR_ACTIVE_AND_PREVIOUSLY_ACTIVE`) in the next call of [J1939Dcm_MainFunction](#).]

[SWS_J1939Dcm_00184]

Upstream requirements: [RS_Diag_04112](#)

[If the return value of the function `Dem_J1939DcmClearDTC` is `E_OK` or `DEM_PENDING`, the [J1939 Diagnostic Communication Manager](#) shall send a [positive acknowledgement \(ACK\)](#) by `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_POSITIVE`.]

[SWS_J1939Dcm_00185] [If return value is other than `E_OK` or `DEM_PENDING`, the [J1939 Diagnostic Communication Manager](#) shall send a [negative acknowledgement \(NACK\)](#) by `J1939Rm_SendAck` with parameter `ackCode` set to `J1939RM_ACK_NEGATIVE`.]

Note: In case the [destination address](#) of the [request](#) was broadcast (`0xFF`), no [acknowledgement](#) shall be send according to [SAE J1939-73](#) (refer [\[SWS_J1939Dcm_00113\]](#)).

7.8 Error Classification

The section 7.2 “Error Handling” of the [\[18, SWS BSW General\]](#) describes the error handling of the [Basic Software](#) in detail. Above all, it constitutes a classification scheme consisting of five error types which may occur in [BSW](#) modules.

Based on this foundation, this section specifies particular errors arranged in the respective subsections below.

7.8.1 Development Errors

[SWS_J1939Dcm_00090] Definiton of development errors in module J1939Dcm [

<i>Type of error</i>	<i>Related error code</i>	<i>Error value</i>
API service called with wrong PDU or SDU.	J1939DCM_E_INVALID_PDU_SDU_ID	0x01
API service called with or in a wrong state	J1939DCM_E_INVALID_STATE	0x06
API service called with wrong node parameter	J1939DCM_E_INVALID_NODE	0x08
API service called with wrong channel parameter	J1939DCM_E_INVALID_CHANNEL	0x0B
API service called with wrong PGN parameter	J1939DCM_E_INVALID_PGN	0x0D
API function called with a NULL Pointer	J1939DCM_E_PARAM_POINTER	0x11
J1939Dcm initialisation failed	J1939DCM_E_INIT_FAILED	0x14
API service used in un-initialized state	J1939DCM_E_UNINIT	0x20
J1939Dcm_Init used in initialized state	J1939DCM_E_REINIT	0x21

]

7.8.2 Runtime Errors

[SWS_J1939Dcm_00198] Definiton of runtime errors in module J1939Dcm [

<i>Type of error</i>	<i>Related error code</i>	<i>Error value</i>
Buffer too small	J1939DCM_E_BUFFER_TOO_SMALL	0x0E

]

7.8.3 Production Errors

There are no production errors.

7.8.4 Extended Production Errors

There are no extended production errors.

8 API Specification

8.1 Imported Types

This section lists all types used by the [J1939 Diagnostic Communication Manager](#) together with the defining module.

[SWS_J1939Dcm_00085] Definition of imported datatypes of module J1939Dcm

[

<i>Module</i>	<i>Header File</i>	<i>Imported Type</i>
Comtype	ComStack_Types.h	BufReq_ReturnType
	ComStack_Types.h	NetworkHandleType
	ComStack_Types.h	PdulIdType
	ComStack_Types.h	PdulInfoType
	ComStack_Types.h	PdulLengthType
	ComStack_Types.h	RetryInfoType
	ComStack_Types.h	TpDataStateType
Dem	Dem.h	Dem_J1939DcmDTCStatusFilterType
	Dem.h	Dem_J1939DcmDiagnosticReadiness1Type
	Dem.h	Dem_J1939DcmDiagnosticReadiness2Type
	Dem.h	Dem_J1939DcmDiagnosticReadiness3Type
	Dem.h	Dem_J1939DcmLampStatusType
	Dem.h	Dem_J1939DcmSetClearFilterType
	Dem.h	Dem_J1939DcmSetFreezeFrameFilterType
	Dem_J1939Dcm.h	Dem_DTCKindType
Rte_Dem_Type.h	Dem_DTCOriginType	
J1939Rm	Rte_J1939Rm_Type.h	J1939Rm_AckCode
	Rte_J1939Rm_Type.h	J1939Rm_ExtIdInfoType
	Rte_J1939Rm_Type.h	J1939Rm_ExtIdType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

]

The types that are declared in `ComStack_Types.h` are defined in [22, SWS Communication Stack Types], while the types declared in `Std_Types.h` are defined in [23, SWS Standard Types].

8.2 Type Definitions

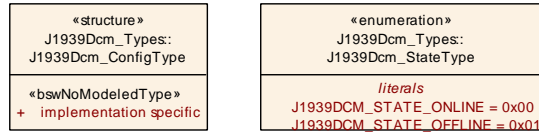


Figure 8.1: Overview of Type Definitions

8.2.1 J1939Dcm_ConfigType

[SWS_J1939Dcm_00111] Definition of datatype J1939Dcm_ConfigType [

Name	J1939Dcm_ConfigType		
Kind	Structure		
Elements	implementation specific		
	Type	–	
	Comment	–	
Description	<p>This is the base type for the configuration of the J1939 Diagnostic Communication Manager.</p> <p>A pointer to an instance of this structure will be used in the initialization of the J1939 Diagnostic Communication Manager.</p> <p>The content of this structure is defined in chapter 10 Configuration specification.</p>		
Available via	J1939Dcm.h		

]

8.2.2 J1939Dcm_StateType

[SWS_J1939Dcm_00123] Definition of datatype J1939Dcm_StateType [

Name	J1939Dcm_StateType		
Kind	Enumeration		
Range	J1939DCM_STATE_ONLINE	0x00	Normal communication
	J1939DCM_STATE_OFFLINE	0x01	No diagnostic communication
Description	This type represents the communication state of the J1939 Diagnostic Communication Manager.		
Available via	J1939Dcm.h		

]

8.3 Function Definitions

This is a list of functions provided for upper layer modules.

8.3.1 J1939Dcm_Init

[SWS_J1939Dcm_00098] Definition of API function J1939Dcm_Init [

Service Name	J1939Dcm_Init	
Syntax	<pre>void J1939Dcm_Init (const J1939Dcm_ConfigType* configPtr)</pre>	
Service ID [hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	configPtr	Pointer to selected configuration structure
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This function initializes the J1939 Diagnostic Communication Manager.	
Available via	J1939Dcm.h	

]

See [Section 7.2.1](#) for details.

8.3.2 J1939Dcm_DeInit

[SWS_J1939Dcm_00099] Definition of API function J1939Dcm_DeInit [

Service Name	J1939Dcm_DeInit	
Syntax	<pre>void J1939Dcm_DeInit (void)</pre>	
Service ID [hex]	0x02	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This function resets the J1939 Diagnostic Communication Manager to the uninitialized state.	
Available via	J1939Dcm.h	

]

See [Section 7.2.1](#) for details.

8.3.3 J1939Dcm_GetVersionInfo

[SWS_J1939Dcm_00100] Definition of API function J1939Dcm_GetVersionInfo [

Service Name	J1939Dcm_GetVersionInfo	
Syntax	<pre>void J1939Dcm_GetVersionInfo (Std_VersionInfoType * versioninfo)</pre>	
Service ID [hex]	0x03	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	versioninfo	Pointer to where to store the version information of this module.
Return value	None	
Description	Returns the version information of this module.	
Available via	J1939Dcm.h	

]

See subsection 8.3.4 “Get Version Information” of [18, SWS BSW General] for details. The module ID of the [SAE J1939 Diagnostic Communication Manager](#) is also defined in [18, SWS BSW General].

8.3.4 J1939Dcm_SetState

[SWS_J1939Dcm_00124] Definition of API function J1939Dcm_SetState [

Service Name	J1939Dcm_SetState	
Syntax	<pre>Std_ReturnType J1939Dcm_SetState (NetworkHandleType channel, uint8 node, J1939Dcm_StateType newState)</pre>	
Service ID [hex]	0x0b	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	channel	Channel for which the state shall be changed.
	node	Node for which the state shall be changed.
	newState	New state the J1939Dcm shall enter, see definition of J1939Dcm_StateType for available states.
Parameters (inout)	None	



△

Parameters (out)	None	
Return value	Std_ReturnType	E_OK: New communication state was set E_NOT_OK: Communication state was not changed due to wrong value in NewState or wrong initialization state of the module.
Description	Changes the communication state of J1939Dcm to offline or online.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00130] [The [J1939 Diagnostic Communication Manager](#) shall reject the state change by returning `E_NOT_OK` when the `newState` is not in the valid range. If development error detection is enabled via [J1939DcmDevErrorDetect](#), the development error `J1939DCM_E_INVALID_STATE` shall be reported.]

[SWS_J1939Dcm_00147] [If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_SetState](#) shall check if the `node` parameter is configured ([J1939DcmNmNodeRef](#)). In case of an error, the function [J1939Dcm_SetState](#) shall return without any effect and shall report the error to the [Default Error Tracer](#) with the error code `J1939DCM_E_INVALID_NODE`.]

[SWS_J1939Dcm_00148] [If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_SetState](#) shall check if the `channel` parameter is configured ([J1939DcmDiagnosticMessageSupportChannelRef](#)) for the requested `node` parameter. In case of an error, the function [J1939Dcm_SetState](#) shall return without any effect and shall report the error to the [Default Error Tracer](#) with the error code `J1939DCM_E_INVALID_CHANNEL`.]

8.3.5 J1939Dcm_GenericDMxTransmit

[SWS_J1939Dcm_91007] Definition of API function J1939Dcm_GenericDMxTransmit

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	J1939Dcm_GenericDMxTransmit	
Syntax	Std_ReturnType J1939Dcm_GenericDMxTransmit (uint8 dmId, uint8 node, NetworkHandleType channel, uint8 destAddress, uint8 priority)	
Service ID [hex]	0x49	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmId	Number of the J1939 diagnostic message.
	node	Node by which the message shall be sent.
	channel	Channel on which the message shall be transmitted
	destAddress	Address of the node that shall receive the diagnostic message or 0xFF for broadcast.
	priority	Priority of the diagnostic message.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Transmit request has been accepted. E_NOT_OK: Transmit request has not been accepted.
Description	Requests transmission of a diagnostic message	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00206]

Upstream requirements: [RS_Diag_04241](#)

[If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_GenericDMxTransmit](#) shall check if the `dmId` parameter addresses a configured (via [J1939DcmDiagnosticMessageSupport](#)) but unsupported `DMx` message. In case of an error, the function [J1939Dcm_GenericDMxTransmit](#) shall return without any effect and shall report the error to the [Default Error Tracer](#) with the error code [J1939DCM_E_INVALID_PGN](#).]

The currently supported [diagnostic messages](#) are listed in [\[SWS_J1939Dcm_00238\]](#).

[SWS_J1939Dcm_00207]

Upstream requirements: [RS_Diag_04241](#)

[If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_GenericDMxTransmit](#) shall check if the `node` parameter is configured ([J1939DcmNmNodeRef](#)). In case of an error, the function [J1939Dcm_GenericDMxTransmit](#) shall return without any effect and shall report the error to the `Default Error Tracer` with the error code [J1939DCM_E_INVALID_NODE](#).]

[SWS_J1939Dcm_00208]

Upstream requirements: [RS_Diag_04241](#)

[If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_GenericDMxTransmit](#) shall check if the `channel` parameter is configured ([J1939DcmDiagnosticMessageSupportChannelRef](#)) for the requested `node` parameter. In case of an error, the function [J1939Dcm_GenericDMxTransmit](#) shall return without any effect and shall report the error to the `Default Error Tracer` with the error code [J1939DCM_E_INVALID_CHANNEL](#).]

8.4 Callback Notifications

This is a list of functions provided for other modules.

8.4.1 J1939Dcm_RequestIndication

[SWS_J1939Dcm_00101] Definition of callback function [J1939Dcm_RequestIndication](#) [

Service Name	J1939Dcm_RequestIndication	
Syntax	<pre>void J1939Dcm_RequestIndication (uint8 node, NetworkHandleType channel, uint32 requestedPgn, const J1939Rm_ExtIdInfoType* extIdInfo, uint8 sourceAddress, uint8 destAddress, uint8 priority)</pre>	
Service ID [hex]	0x47	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	node	Node by which the request was received.
	channel	Channel on which the request was received.
	requestedPgn	PGN of the requested PG.



△

	extIdInfo	Extended identifier bytes.
	sourceAddress	Address of the node that sent the Request PG.
	destAddress	Address of this node or 0xFF for broadcast.
	priority	Priority of the Request PG.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Indicates reception of a Request or Request2 PG.	
Available via	J1939Dcm.h	

」

[SWS_J1939Dcm_00138] [When the interface `J1939Dcm_RequestIndication` is called while the `J1939Dcm` is in offline state (refer to `J1939Dcm_SetState`), the `J1939 Diagnostic Communication Manager` shall ignore the request message. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

[SWS_J1939Dcm_00149] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_RequestIndication` shall check if the `node` parameter is configured (`J1939DcmNmNodeRef`). In case of an error, the function `J1939Dcm_RequestIndication` shall return without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_NODE`.]

[SWS_J1939Dcm_00150] [The function `J1939Dcm_RequestIndication` shall check if the `channel` parameter is configured (`J1939DcmDiagnosticMessageSupportChannelRef`) for the requested `node` parameter. If the channel is not configured, the function `J1939Dcm_RequestIndication` shall return without any effect.]

The parameter `requestedPgn` is verified in **[SWS_J1939Dcm_00006]**.

The parameter `destAddress` is only used to check for the broadcast address (0xFF) and requires therefore no special verification.

The parameter `sourceAddress` is used to set the `destination address` for the transmission, but is already verified in `J1939Rm`.

The parameter `priority` needs not to be verified, because it is not considered at all.

8.4.2 J1939Dcm_RxIndication

[SWS_J1939Dcm_00128] Definition of callback function J1939Dcm_RxIndication

[

Service Name	J1939Dcm_RxIndication	
Syntax	<pre>void J1939Dcm_RxIndication (PduIdType RxPduId, const PduInfoType* PduInfoPtr)</pre>	
Service ID [hex]	0x42	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different Pdulds. Non reentrant for the same Pdulld.	
Parameters (in)	RxPdulld	ID of the received PDU.
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Indication of a received PDU from a lower layer communication interface module.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00139] [When the interface `J1939Dcm_RxIndication` is called while the `J1939Dcm` is in offline state (refer to `J1939Dcm_SetState`), the `J1939 Diagnostic Communication Manager` shall ignore the command message. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

[SWS_J1939Dcm_00151] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_RxIndication` shall check if the `RxPduId` parameter is not configured (`J1939DcmRxPduId`) on any `DMx` message (`J1939DcmDiagnosticMessageSupport`). In case of an error, the function `J1939Dcm_RxIndication` shall return without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PDU_SDU_ID`.]

8.4.3 J1939Dcm_TxConfirmation

[SWS_J1939Dcm_00145] Definition of callback function J1939Dcm_TxConfirmation

Service Name	J1939Dcm_TxConfirmation	
Syntax	<pre>void J1939Dcm_TxConfirmation (PduIdType TxPduId, Std_ReturnType result)</pre>	
Service ID [hex]	0x40	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different Pdulds. Non reentrant for the same Pduld.	
Parameters (in)	TxPdulId	ID of the PDU that has been transmitted.
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00146] [When the interface [J1939Dcm_TxConfirmation](#) is called while the [J1939Dcm](#) is in offline state (refer to [J1939Dcm_SetState](#)), the [J1939 Diagnostic Communication Manager](#) shall release the buffer (of [\[SWS_J1939Dcm_00115\]](#)). Further a call to [DET](#) with parameter [J1939DCM_E_INVALID_STATE](#) shall be triggered if the configuration parameter [J1939DcmDevErrorDetect](#) is enabled.]

[SWS_J1939Dcm_00162] [If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_TxConfirmation](#) shall check if the [TxPduId](#) parameter is not configured ([J1939DcmTxPduId](#)) on any [DMx](#) message ([J1939DcmDiagnosticMessageSupport](#)). In case of an error, the function [J1939Dcm_TxConfirmation](#) shall return without any effect and shall report the error to the [Default Error Tracer](#) with the error code [J1939DCM_E_INVALID_PDU_SDU_ID](#).]

[SWS_J1939Dcm_00163] [The function [J1939Dcm_TxConfirmation](#) shall check if it is called out of context i.e. if the [J1939Dcm](#) is currently transmitting a response message over TP protocol. In case of an error, the function [J1939Dcm_TxConfirmation](#) shall return without any effect. Further a call to [DET](#) with parameter [J1939DCM_E_INVALID_STATE](#) shall be triggered if the configuration parameter [J1939DcmDevErrorDetect](#) is enabled.]

8.4.4 J1939Dcm_StartOfReception

[SWS_J1939Dcm_00102] Definition of callback function J1939Dcm_StartOfReception [

Service Name	J1939Dcm_StartOfReception	
Syntax	<pre>BufReq_ReturnType J1939Dcm_StartOfReception (PduIdType id, const PduInfoType* info, PduLengthType TpSduLength, PduLengthType* bufferSizePtr)</pre>	
Service ID [hex]	0x46	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the I-PDU.
	info	Pointer to a PduInfoType structure containing the payload data (without protocol information) and payload length of the first frame or single frame of a transport protocol I-PDU reception, and the MetaData related to this PDU. If neither first/single frame data nor MetaData are available, this parameter is set to NULL_PTR.
	TpSduLength	Total length of the N-SDU to be received.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer in the receiving module. This parameter will be used to compute the Block Size (BS) in the transport protocol module.
Return value	BufReq_ReturnType	<p>BUFREQ_OK: Connection has been accepted. bufferSizePtr indicates the available receive buffer; reception is continued. If no buffer of the requested size is available, a receive buffer size of 0 shall be indicated by bufferSizePtr.</p> <p>BUFREQ_E_NOT_OK: Connection has been rejected; reception is aborted. bufferSizePtr remains unchanged.</p> <p>BUFREQ_E_OVFL: No buffer of the required length can be provided; reception is aborted. bufferSizePtr remains unchanged.</p>
Description	This function is called at the start of receiving an N-SDU. The N-SDU might be fragmented into multiple N-PDUs (FF with one or more following CFs) or might consist of a single N-PDU (SF). The service shall provide the currently available maximum buffer size when invoked with TpSduLength equal to 0.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00140] [When the interface [J1939Dcm_StartOfReception](#) is called while the [J1939Dcm](#) is in offline state (refer to [J1939Dcm_SetState](#)), the [J1939 Diagnostic Communication Manager](#) shall reject this command message by returning `BUFREQ_E_NOT_OK`. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

[SWS_J1939Dcm_00152] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_StartOfReception` shall check if the `id` parameter is not configured (`J1939DcmRxPduId`) on any `DMx` message (`J1939DcmDiagnosticMessageSupport`). In case of an error,

the function `J1939Dcm_StartOfReception` shall return with `BUFREQ_E_NOT_OK` and without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PDU_SDU_ID`.]

[SWS_J1939Dcm_00153] [The function `J1939Dcm_StartOfReception` shall check if the `TpSduLength` parameter is smaller or equal as the configured buffer size (`J1939DcmCommonBufferSize`). In case of an error, the function `J1939Dcm_StartOfReception` shall return with `BUFREQ_E_OVFL`.]

[SWS_J1939Dcm_00155] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_StartOfReception` shall check if the `J1939Dcm` is the right state to receive a command message over TP protocol. In case of an error, the function `J1939Dcm_StartOfReception` shall return with `BUFREQ_E_NOT_OK` and without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_STATE`.]

[SWS_J1939Dcm_00186] [When the API `J1939Dcm_StartOfReception` is invoked with `TpSduLength` equal to 0, the value `BUFREQ_E_NOT_OK` shall be returned and no further action shall be taken.]

8.4.5 J1939Dcm_CopyRxData

[SWS_J1939Dcm_00103] Definition of callback function `J1939Dcm_CopyRxData`

[

Service Name	J1939Dcm_CopyRxData	
Syntax	BufReq_ReturnType J1939Dcm_CopyRxData (PduIdType id, const PduInfoType* info, PduLengthType* bufferSizePtr)	
Service ID [hex]	0x44	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the received I-PDU.
	info	Provides the source buffer (SduDataPtr) and the number of bytes to be copied (SduLength). An SduLength of 0 can be used to query the current amount of available buffer in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer after data has been copied.





Return value	BufReq_ReturnType	BUFREQ_OK: Data copied successfully BUFREQ_E_NOT_OK: Data was not copied because an error occurred.
Description	This function is called to provide the received data of an I-PDU segment (N-PDU) to the upper layer. Each call to this function provides the next part of the I-PDU data. The size of the remaining buffer is written to the position indicated by bufferSizePtr.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00141] [The function `J1939Dcm_CopyRxData` shall check if it is called out of context i.e. if the `J1939Dcm` is currently receiving a command message over TP protocol. In case of an error, the function `J1939Dcm_CopyRxData` shall return `BUFREQ_E_NOT_OK`. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

[SWS_J1939Dcm_00154] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_CopyRxData` shall check if the `id` parameter is not configured (`J1939DcmRxPduId`) on any `DMx` message (`J1939DcmDiagnosticMessageSupport`). In case of an error, the function `J1939Dcm_CopyRxData` shall return with `BUFREQ_E_NOT_OK` and without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PDU_SDU_ID`.]

8.4.6 J1939Dcm_TpRxIndication

[SWS_J1939Dcm_00104] Definition of callback function `J1939Dcm_TpRxIndication` [

Service Name	J1939Dcm_TpRxIndication	
Syntax	<pre>void J1939Dcm_TpRxIndication (PduIdType id, Std_ReturnType result)</pre>	
Service ID [hex]	0x45	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the received I-PDU.
	result	E_OK: The PDU was received. E_NOT_OK: Reception of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	





Description	Called after an I-PDU has been received via the TP API, the result indicates whether the transmission was successful or not.
Available via	J1939Dcm.h

]

[SWS_J1939Dcm_00142] [The function `J1939Dcm_TpRxIndication` shall check if it is called out of context i.e. if the `J1939Dcm` is currently receiving a response message over TP protocol. In case of an error, the function `J1939Dcm_TpRxIndication` shall return without any effect. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

[SWS_J1939Dcm_00156] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_TpRxIndication` shall check if the `id` parameter is not configured (`J1939DcmRxPduId`) on any `DMx` message (`J1939DcmDiagnosticMessageSupport`). In case of an error, the function `J1939Dcm_TpRxIndication` shall return and without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PDU_SDU_ID`.]

8.4.7 J1939Dcm_CopyTxData

[SWS_J1939Dcm_00105] Definition of callback function J1939Dcm_CopyTxData

[

Service Name	J1939Dcm_CopyTxData	
Syntax	<pre>BufReq_ReturnType J1939Dcm_CopyTxData (PduIdType id, const PduInfoType* info, const RetryInfoType* retry, PduLengthType* availableDataPtr)</pre>	
Service ID [hex]	0x43	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the transmitted I-PDU.
	info	Provides the destination buffer (<code>SduDataPtr</code>) and the number of bytes to be copied (<code>SduLength</code>). If not enough transmit data is available, no data is copied by the upper layer module and <code>BUFREQ_E_BUSY</code> is returned. The lower layer module may retry the call. An <code>SduLength</code> of 0 can be used to indicate state changes in the retry parameter or to query the current amount of available data in the upper layer module. In this case, the <code>SduDataPtr</code> may be a <code>NULL_PTR</code> .





	retry	<p>This parameter is used to acknowledge transmitted data or to retransmit data after transmission problems.</p> <p>If the retry parameter is a NULL_PTR, it indicates that the transmit data can be removed from the buffer immediately after it has been copied. Otherwise, the retry parameter must point to a valid RetryInfoType element.</p> <p>If TpDataState indicates TP_CONFPENDING, the previously copied data must remain in the TP buffer to be available for error recovery. TP_DATACONF indicates that all data that has been copied before this call is confirmed and can be removed from the TP buffer. Data copied by this API call is excluded and will be confirmed later. TP_DATARETRY indicates that this API call shall copy previously copied data in order to recover from an error. In this case TxTpDataCnt specifies the offset in bytes from the current data copy position.</p>
Parameters (inout)	None	
Parameters (out)	availableDataPtr	Indicates the remaining number of bytes that are available in the upper layer module's Tx buffer. availableDataPtr can be used by TP modules that support dynamic payload lengths (e.g. FrIsoTp) to determine the size of the following CFs.
Return value	BufReq_ReturnType	<p>BUFREQ_OK: Data has been copied to the transmit buffer completely as requested.</p> <p>BUFREQ_E_BUSY: Request could not be fulfilled, because the required amount of Tx data is not available. The lower layer module may retry this call later on. No data has been copied.</p> <p>BUFREQ_E_NOT_OK: Data has not been copied. Request failed.</p>
Description	This function is called to acquire the transmit data of an I-PDU segment (N-PDU). Each call to this function provides the next part of the I-PDU data unless retry->TpDataState is TP_DATARETRY. In this case the function restarts to copy the data beginning at the offset from the current position indicated by retry->TxTpDataCnt. The size of the remaining data is written to the position indicated by availableDataPtr.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00143] [The function [J1939Dcm_CopyTxData](#) shall check if it is called out of context i.e. if the [J1939Dcm](#) is currently transmitting a response message over TP protocol. In case of an error, the function [J1939Dcm_CopyTxData](#) shall return [BUFREQ_E_NOT_OK](#). Further a call to [DET](#) with parameter [J1939DCM_E_INVALID_STATE](#) shall be triggered if the configuration parameter [J1939DcmDevErrorDetect](#) is enabled.]

[SWS_J1939Dcm_00158] [If the configuration parameter [J1939DcmDevErrorDetect](#) is enabled, the function [J1939Dcm_CopyTxData](#) shall check if the [id](#) parameter is not configured ([J1939DcmTxPduId](#)) on any [DMx](#) message ([J1939DcmDiagnosticMessageSupport](#)). In case of an error, the function [J1939Dcm_CopyTxData](#) shall return with [BUFREQ_E_NOT_OK](#) and without any effect and shall report the error to the [Default Error Tracer](#) with the error code [J1939DCM_E_INVALID_PDU_SDU_ID](#).]

8.4.8 J1939Dcm_TpTxConfirmation

[SWS_J1939Dcm_00106] Definition of callback function J1939Dcm_TpTxConfirmation [

Service Name	J1939Dcm_TpTxConfirmation	
Syntax	<pre>void J1939Dcm_TpTxConfirmation (PduIdType id, Std_ReturnType result)</pre>	
Service ID [hex]	0x48	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the transmitted I-PDU.
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This function is called after the I-PDU has been transmitted on its network, the result indicates whether the transmission was successful or not.	
Available via	J1939Dcm.h	

]

[SWS_J1939Dcm_00160] [If the configuration parameter `J1939DcmDevErrorDetect` is enabled, the function `J1939Dcm_TpTxConfirmation` shall check if the `id` parameter is not configured (`J1939DcmTxPduId`) on any `DMx` message (`J1939DcmDiagnosticMessageSupport`). In case of an error, the function `J1939Dcm_TpTxConfirmation` shall return and without any effect and shall report the error to the `Default Error Tracer` with the error code `J1939DCM_E_INVALID_PDU_SDU_ID`.]

[SWS_J1939Dcm_00161] [The function `J1939Dcm_TpTxConfirmation` shall check if it is called out of context i.e. if the `J1939Dcm` is currently transmitting a response message over TP protocol. In case of an error, the function `J1939Dcm_TpTxConfirmation` shall return and without any effect. Further a call to `DET` with parameter `J1939DCM_E_INVALID_STATE` shall be triggered if the configuration parameter `J1939DcmDevErrorDetect` is enabled.]

8.4.9 Callback Notifications from DEM

8.4.9.1 J1939Dcm_DemTriggerOnDTCStatus

[SWS_J1939Dcm_00122] Definition of callback function J1939Dcm_DemTriggerOnDTCStatus [

Service Name	J1939Dcm_DemTriggerOnDTCStatus	
Syntax	<pre>void J1939Dcm_DemTriggerOnDTCStatus (uint32 DTC, uint8 ClientId)</pre>	
Service ID [hex]	0x0a	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (in)	DTC	Diagnostic Trouble Code in UDS format.
	ClientId	DemClientId value that references the fault memory assigned to the DTC.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Trigger for DM01 message that a UDS status change has happened.	
Available via	J1939Dcm_Dem.h	

]

8.5 Scheduled Functions

These functions are directly called by [Basic Software Scheduler](#). The following functions have no return value and no parameters. All functions are non-reentrant.

8.5.1 J1939Dcm_MainFunction

[SWS_J1939Dcm_00107] Definition of scheduled function J1939Dcm_MainFunction [

Service Name	J1939Dcm_MainFunction
Syntax	<pre>void J1939Dcm_MainFunction (void)</pre>
Service ID [hex]	0x04
Description	Main function of the J1939 Diagnostic Communication Manager. Used for scheduling purposes and timeout supervision.





Available via	SchM_J1939Dcm.h
----------------------	-----------------

]

[SWS_J1939Dcm_00108] [The frequency of invocations of `J1939Dcm_MainFunction` is determined by the configuration parameter `J1939DcmMainFunctionPeriod`.]

8.6 Expected Interfaces

In this chapter all external interfaces required from other modules are listed.

8.6.1 Mandatory Interfaces

This chapter defines all external interfaces which are required to fulfill a mandatory functionality of the module.

[SWS_J1939Dcm_00199] Definition of mandatory interfaces required by module J1939Dcm [

<i>API Function</i>	<i>Header File</i>	<i>Description</i>
Det_ReportRuntimeError	Det.h	Service to report runtime errors. If a callout has been configured then this callout shall be called.

]

8.6.2 Optional Interfaces

This chapter defines all external interfaces which are required to fulfill an optional functionality of the module.

[SWS_J1939Dcm_00132] Definition of optional interfaces requested by module J1939Dcm [

<i>API Function</i>	<i>Header File</i>	<i>Description</i>
BswM_J1939DcmBroadcastStatus	BswM_J1939Dcm.h	This API tells the BswM the desired communication status of the available networks. The status will typically be activated via COM I-PDU group switches.





API Function	Header File	Description
Dem_J1939DcmClearDTC	Dem_J1939Dcm.h	Clears the status of all event(s) related to the specified DTC(s), as well as all associated event memory entries for these event(s).
Dem_J1939DcmFirstDTCwithLampStatus	Dem_J1939Dcm.h	The function sets the filter to the first applicable DTC for the DM31 response for a specific node.
Dem_J1939DcmGetNextDTCwithLampStatus	Dem_J1939Dcm.h	Gets the next filtered J1939 DTC for DM31 including current LampStatus.
Dem_J1939DcmGetNextFilteredDTC	Dem_J1939Dcm.h	Gets the next filtered J1939 DTC.
Dem_J1939DcmGetNextFilteredRatio	Dem_J1939Dcm.h	Gets the next filtered Ratio.
Dem_J1939DcmGetNextFreezeFrame	Dem_J1939Dcm.h	Gets next freeze frame data. The function stores the data in the provided DestBuffer.
Dem_J1939DcmGetNextSPNInFreezeFrame	Dem_J1939Dcm.h	Gets next SPN.
Dem_J1939DcmGetNumberOfFilteredDTC	Dem_J1939Dcm.h	Gets the number of currently filtered DTCs set by the function Dem_J1939DcmSetDTCFilter.
Dem_J1939DcmReadDiagnosticReadiness1	Dem_J1939Dcm.h	Service to report the value of Diagnostic Readiness 1 (DM05) computed by the Dem.
Dem_J1939DcmReadDiagnosticReadiness2	Dem_J1939Dcm.h	Service to report the value of Diagnostic Readiness 2 (DM21) computed by the Dem.
Dem_J1939DcmReadDiagnosticReadiness3	Dem_J1939Dcm.h	Service to report the value of Diagnostic Readiness 3 (DM26) computed by the Dem.
Dem_J1939DcmSetDTCFilter	Dem_J1939Dcm.h	The function sets the DTC filter for a specific node and returns the composite lamp status of the filtered DTCs.
Dem_J1939DcmSetFreezeFrameFilter	Dem_J1939Dcm.h	The function sets the FreezeFrame filter for a specific node.
Dem_J1939DcmSetRatioFilter	Dem_J1939Dcm.h	The function sets the Ratio filter for a specific node and returns the corresponding Ignition Cycle Counter and General Denominator.
Det_ReportError	Det.h	Service to report development errors.
J1939Rm_SendAck	J1939Rm.h	Requests transmission of an Acknowledgement PG.
PduR_J1939DcmCancelReceive	PduR_J1939Dcm.h	Requests cancellation of an ongoing reception of a PDU in a lower layer transport protocol module.
PduR_J1939DcmCancelTransmit	PduR_J1939Dcm.h	Requests cancellation of an ongoing transmission of a PDU in a lower layer communication module.
PduR_J1939DcmTransmit	PduR_J1939Dcm.h	Requests transmission of a PDU.

]

[SWS_J1939Dcm_00167] [The parameter `broadcast` of `J1939Rm_SendAck` shall always be set to `FALSE`.]

[SWS_J1939Dcm_00187] [The parameter `extIdInfo` of `J1939Rm_SendAck` shall always be set to `NULL_PTR`.]

Background: The `ACKM` message is never sent as response to a broadcast `request`. This is precluded by [SAE J1939-21](#) for `negative acknowledgements`, and by [SAE J1939-73](#) for `positive acknowledgements` of `DM03`, `DM11`, and `DM55`.

8.6.3 Configurable interfaces

This section lists all interfaces where the target function can be configured. The target function is usually a call-back function. The name of this kind of interfaces is not fixed because they are configurable.

8.6.3.1 <GenericDMxRequestIndication>

[SWS_J1939Dcm_91001] Definition of configurable interface <GenericDMxRequestIndication>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxRequestIndication>	
Syntax	<pre>void <GenericDMxRequestIndication> (uint8 dmId, NetworkHandleType channel, uint8 sourceAddress, uint8 destAddress, uint8 priority)</pre>	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmId	Number of the requested J1939 diagnostic message.
	channel	Channel on which the request was received.
	sourceAddress	Address of the node that sent the Request PG.
	destAddress	Address of this node or 0xFF for broadcast.
	priority	Priority of the Request PG.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Indicates reception of a Request or Request2 PG for an unsupported diagnostic message.	
Available via	J1939Dcm.h	

]

8.6.3.2 <GenericDMxCopyTxData>

[SWS_J1939Dcm_91005] Definition of configurable interface <GenericDMxCopyTxData>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxCopyTxData>	
Syntax	<pre>BufReq_ReturnType <GenericDMxCopyTxData> (uint8 dmId, NetworkHandleType channel, const PduInfoType info, const RetryInfoType* retry, PduLengthType* availableDataPtr)</pre>	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmId	Number of the J1939 diagnostic message
	channel	Channel on which the message is transmitted
	info	Provides the destination buffer (SduDataPtr) and the number of bytes to be copied (SduLength). If not enough transmit data is available, no data is copied by the upper layer module and BUFREQ_E_BUSY is returned. The lower layer module may retry the call. An SduLength of 0 can be used to indicate state changes in the retry parameter or to query the current amount of available data in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
	retry	<p>This parameter is used to acknowledge transmitted data or to retransmit data after transmission problems.</p> <p>If the retry parameter is a NULL_PTR, it indicates that the transmit data can be removed from the buffer immediately after it has been copied. Otherwise, the retry parameter must point to a valid RetryInfoType element.</p> <p>If TpDataState indicates TP_CONFENDING, the previously copied data must remain in the TP buffer to be available for error recovery. TP_DATACONF indicates that all data that has been copied before this call is confirmed and can be removed from the TP buffer. Data copied by this API call is excluded and will be confirmed later. TP_DATARETRY indicates that this API call shall copy previously copied data in order to recover from an error. In this case TxTpDataCnt specifies the offset in bytes from the current data copy position.</p>
Parameters (inout)	None	
Parameters (out)	availableDataPtr	Indicates the remaining number of bytes that are available in the upper layer module's Tx buffer. availableDataPtr can be used by TP modules that support dynamic payload lengths (e.g. FrIsoTp) to determine the size of the following CFs.
Return value	BufReq_ReturnType	<p>BUFREQ_OK: Data has been copied to the transmit buffer completely as requested.</p> <p>BUFREQ_E_BUSY: Request could not be fulfilled, because the required amount of Tx data is not available. The lower layer module may retry this call later on. No data has been copied.</p> <p>BUFREQ_E_NOT_OK: Data has not been copied. Request failed.</p>

▽



Description	This function is called to acquire the transmit data of a diagnostic message segment. Each call to this function provides the next part of the diagnostic message data unless retry->TpData State is TP_DATARETRY. In this case the function restarts to copy the data beginning at the offset from the current position indicated by retry->TxTpDataCnt. The size of the remaining data is written to the position indicated by availableDataPtr.
Available via	J1939Dcm.h

]

8.6.3.3 <GenericDMxTxConfirmation>

[SWS_J1939Dcm_91003] Definition of configurable interface <GenericDMxTxConfirmation>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxTxConfirmation>	
Syntax	<pre>void <GenericDMxTxConfirmation> (uint8 dmId, NetworkHandleType channel, Std_ReturnType result)</pre>	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmId	Number of the J1939 diagnostic message.
	channel	Channel on which the message is transmitted.
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Called after a diagnostic message has been transmitted, the result indicates whether the transmission was successful or not.	
Available via	J1939Dcm.h	

]

8.6.3.4 <GenericDMxStartOfReception>

[SWS_J1939Dcm_91004] Definition of configurable interface <GenericDMxStartOfReception>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxStartOfReception>	
Syntax	BufReq_ReturnType <GenericDMxStartOfReception> (uint8 mId, NetworkHandleType channel, PduLengthType length, PduLengthType bufferSizePtr, uint8 sourceAddress, uint8 priority)	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	mId	Number of the J1939 diagnostic message.
	channel	Channel on which the message is received.
	length	Total length of the diagnostic message to be received.
	sourceAddress	Address of the node that sent the diagnostic message.
	priority	Priority of the diagnostic message.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer.
Return value	BufReq_ReturnType	BUFREQ_OK: Connection has been accepted. bufferSizePtr indicates the available receive buffer; reception is continued. If no buffer of the requested size is available, a receive buffer size of 0 shall be indicated by bufferSizePtr. BUFREQ_E_NOT_OK: Connection has been rejected; reception is aborted. bufferSizePtr remains unchanged. BUFREQ_E_OVFL: No buffer of the required length can be provided; reception is aborted. bufferSizePtr remains unchanged.
Description	This function is called at the start of receiving an diagnostic message.	
Available via	J1939Dcm.h	

]

8.6.3.5 <GenericDMxCopyRxData>

[SWS_J1939Dcm_91002] Definition of configurable interface <GenericDMxCopyRxData>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxCopyRxData>	
Syntax	BufReq_ReturnType <GenericDMxCopyRxData> (uint8 dmId, NetworkHandleType channel, const PduInfoType* info, PduLengthType* bufferSizePtr)	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmId	Number of the J1939 diagnostic message.
	channel	Channel on which the message is received.
	info	Provides the source buffer (SduDataPtr) and the number of bytes to be copied (SduLength). An SduLength of 0 can be used to query the current amount of available buffer in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer after data has been copied.
Return value	BufReq_ReturnType	BUFREQ_OK: Data copied successfully BUFREQ_E_NOT_OK: Data was not copied because an error occurred.
Description	This function is called to provide the received data of a diagnostic message segment to the upper layer. Each call to this function provides the next part of the diagnostic message data. The size of the remaining buffer is written to the position indicated by bufferSizePtr.	
Available via	J1939Dcm.h	

]

8.6.3.6 <GenericDMxRxIndication>

[SWS_J1939Dcm_91006] Definition of configurable interface <GenericDMxRxIndication>

Upstream requirements: [RS_Diag_04241](#)

[

Service Name	<GenericDMxRxIndication>	
Syntax	void <GenericDMxRxIndication> (uint8* dmId, NetworkHandleType channel, Std_ReturnType result)	

▽

△

Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	dmlId	Number of the J1939 diagnostic message.
	channel	Channel on which the message is received.
	result	Result of the reception.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Called after a diagnostic message has been received, the result indicates whether the reception was successful or not.	
Available via	J1939Dcm.h	

┌

8.7 Service Interfaces

8.7.1 Implementation Data Types

8.7.1.1 CalibrationIDArrayType

The [J1939Dcm Service Component](#) shall provide the implementation data type [CalibrationIDArrayType](#), if DM19 is configured (refer to [J1939DcmDmxSupport == J1939DCM_DM19_SUPPORT](#)).

[SWS_J1939Dcm_00136] Definition of ImplementationDataType CalibrationIDArrayType [

Name	CalibrationIDArrayType		
Kind	Array	Element type	uint8
Size	16 Elements		
Description	–		
Variation	–		
Available via	Rte_J1939Dcm_Type.h		

┌

8.7.2 Client-Server-Interfaces

8.7.2.1 J1939Dcm_CalibrationInformation

The `J1939Dcm Service Component` shall provide the port interface `J1939Dcm_CalibrationInformation`, if `DM19` is configured (refer to `J1939DcmDmxSupport == J1939DCM_DM19_SUPPORT`).

[SWS_J1939Dcm_00097] Definition of ClientServerInterface J1939Dcm_CalibrationInformation [

Name	J1939Dcm_CalibrationInformation		
Comment	–		
IsService	true		
Variation	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmNode/J1939DcmDiagnosticMessageSupport.J1939DcmDmxSupport)} == J1939DcmDm19Support		
Possible Errors	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	2	E_NEXT	E_NEXT is used if the CVN calculation is finished, but not all CVNs returned yet.
	3	E_NOT_READY	E_NOT_READY is used if the CVN calculation is not finished yet. The tool needs to send the request again.

Operation	GetCalibrationVerificationNumber		
Comment	–		
Mapped to API	–		
Variation	–		
Parameters	CalibrationVerificationNumber		
	Type	uint32	
	Direction	OUT	
	Comment	–	
	Variation	–	
	CalibrationID		
	Type	CalibrationIDArrayType	
	Direction	OUT	
Comment	–		
Variation	–		
Possible Errors	E_OK E_NOT_OK E_NEXT E_NOT_READY		

]

8.7.3 Sender-Receiver-Interfaces

8.7.3.1 DataCondition

[SWS_J1939Dcm_91010] Definition of SenderReceiverInterface DataCondition_{ModeCondition} [

Name	DataCondition_{ModeCondition}	
Comment	–	
IsService	false	
Variation	({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef)} != NULL) ModeCondition = {ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition.SHORT-NAME)}	
Data Elements	data	
	Type	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmDataElementInstance/J1939DcmDataElementInstanceRef)}
	Variation	({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmDataElementInstance/J1939DcmDataElementInstanceRef)} != NULL)
	data	
	Type	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmSubElementInDataElementInstance/J1939DcmSubElementInDataElementInstanceRef)}
	Variation	({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmSubElementInDataElementInstance/J1939DcmSubElementInDataElementInstanceRef)} != NULL)
	data	
	Type	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmSubElementInImplDataElementInstance/J1939DcmSubElementInImplDataElementInstanceRef)}
Variation	({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef->J1939DcmSubElementInImplDataElementInstance/J1939DcmSubElementInImplDataElementInstanceRef)} != NULL)	

]

8.7.4 Ports

8.7.4.1 J1939Dcm_CalibrationInformation

The `J1939DcmServiceComponent` shall provide the port prototype `J1939Dcm_CalibrationInformation`, if `DM19` is configured (refer to `J1939DcmDmxSupport == J1939DCM_DM19_SUPPORT`).

[SWS_J1939Dcm_00137] Definition of Port J1939Dcm_CalibrationInformation required by module J1939Dcm [

Name	J1939Dcm_CalibrationInformation		
Kind	RequiredPort	Interface	J1939Dcm_CalibrationInformation
Description	Port to retrieve the Calibration Verification Numbers (CVNs) from the application.		
Variation	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmNode/J1939DcmDiagnosticMessageSupport.J1939DcmDmxSupport)} == J1939DcmDm19Support		

]

8.7.4.2 DataCondition

[SWS_J1939Dcm_91008] Definition of Port DataCondition_{ModeCondition} required by module J1939Dcm [

Name	DataCondition_{ModeCondition}		
Kind	RequiredPort	Interface	DataCondition_{ModeCondition}
Description	–		
Variation	({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcSRDataElementRef)} != NULL) ModeCondition = {ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition.SHORT-NAME)}		

]

8.7.4.3 ModeCondition

The [J1939Dcm Service Component](#) shall provide the port prototype [ModeCondition](#) for each [J1939DcmSwcModeRef](#).

[SWS_J1939Dcm_91009] Definition of Port ModeCondition_{ModeCondition} required by module J1939Dcm [

Name	ModeCondition_{ModeCondition}		
Kind	RequiredPort		
Interface-Ref	{ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcModeRef)}.parent		
Description	–		





Variation	<pre> ({ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition/J1939DcmSwcModeRef)} != NULL) ModeCondition = {ecuc(J1939Dcm/J1939DcmConfigSet/J1939DcmProcessingConditions/J1939DcmModeCondition.SHORT-NAME)} </pre>
------------------	--

]

9 Sequence Diagrams

This version of the J1939 SWS does not include sequence diagrams.

10 Configuration Specification

In general, this chapter defines configuration parameters and their clustering into containers. For general information about the definition of containers and parameters, refer to the section 10.1 “Introduction to configuration specification” in [18, SWS BSW General]. For details about published information of the [J1939 Diagnostic Communication Manager](#) module, refer to the section 10.3 “Published Information” in [21, SWS BSW General].

The [Section 10.1](#) specifies the structure (containers) and the parameters of the module [J1939Dcm](#).

10.1 Containers and Configuration Parameters

The following subsections summarize all configuration parameters of the [J1939 Diagnostic Communication Manager](#). The detailed meaning of the parameters is described in chapters [7](#) and [8](#).

Some of these containers and parameters are derived from classes and attributes of the [\[24, TPS System Template\]](#), which also contains the rules for these derivations.

The following pictures show an overview of the configuration parameters available for [J1939Dcm](#).

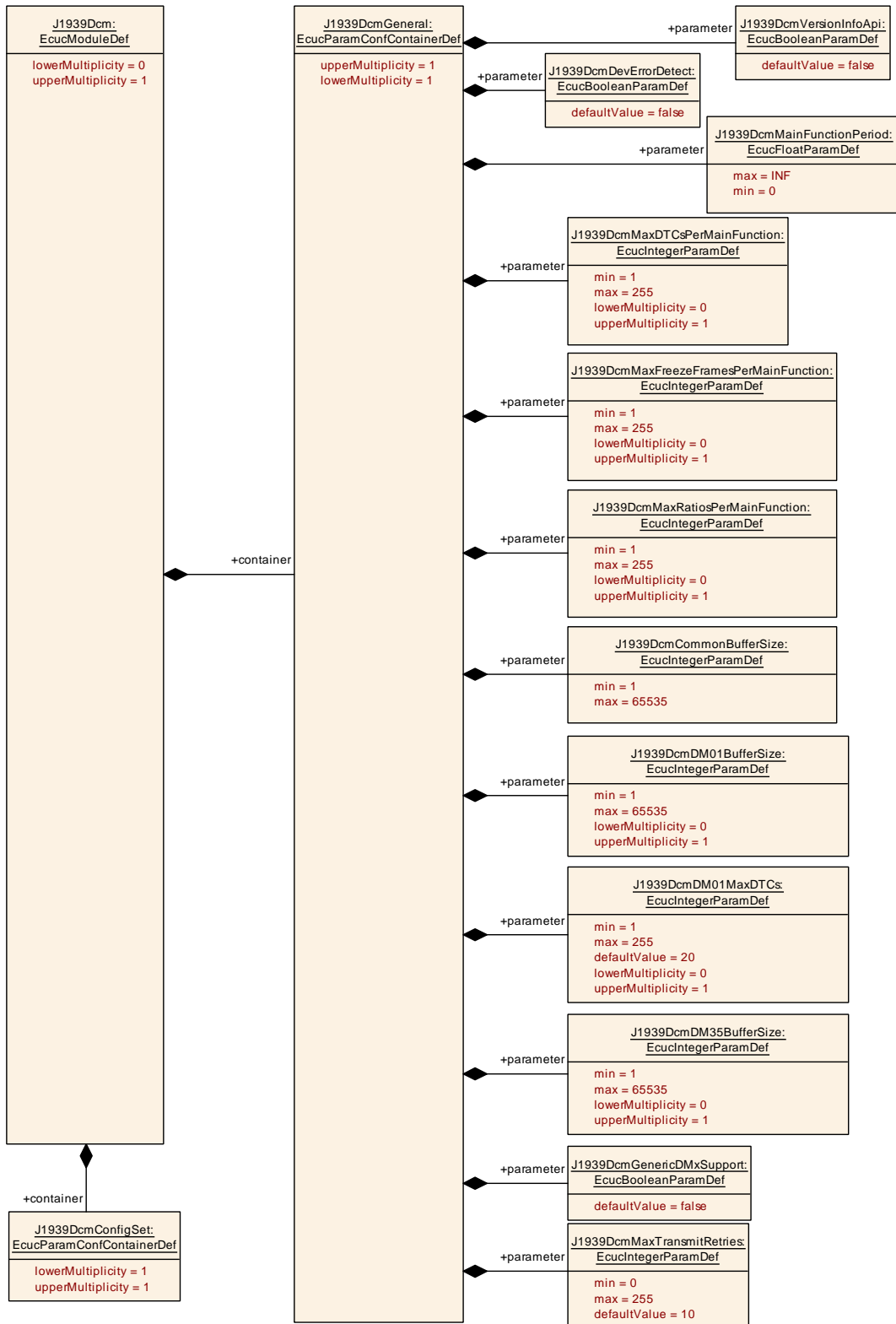


Figure 10.1: Module Configuration

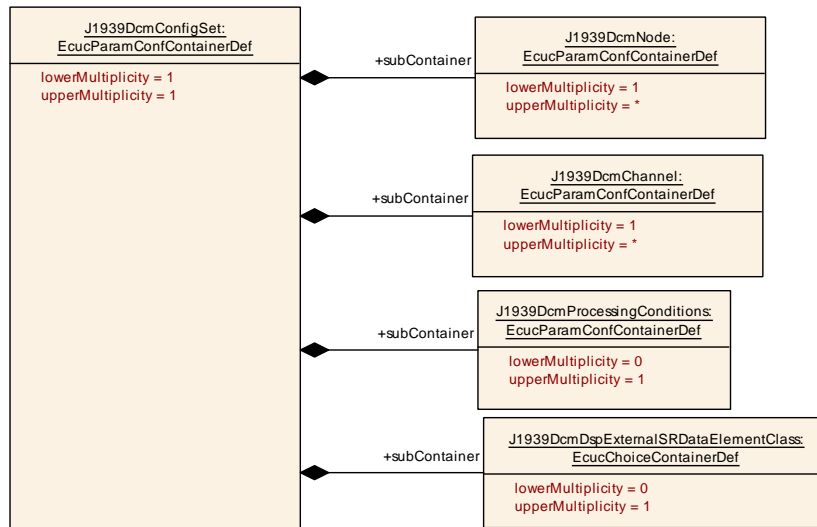


Figure 10.2: Configuration Set

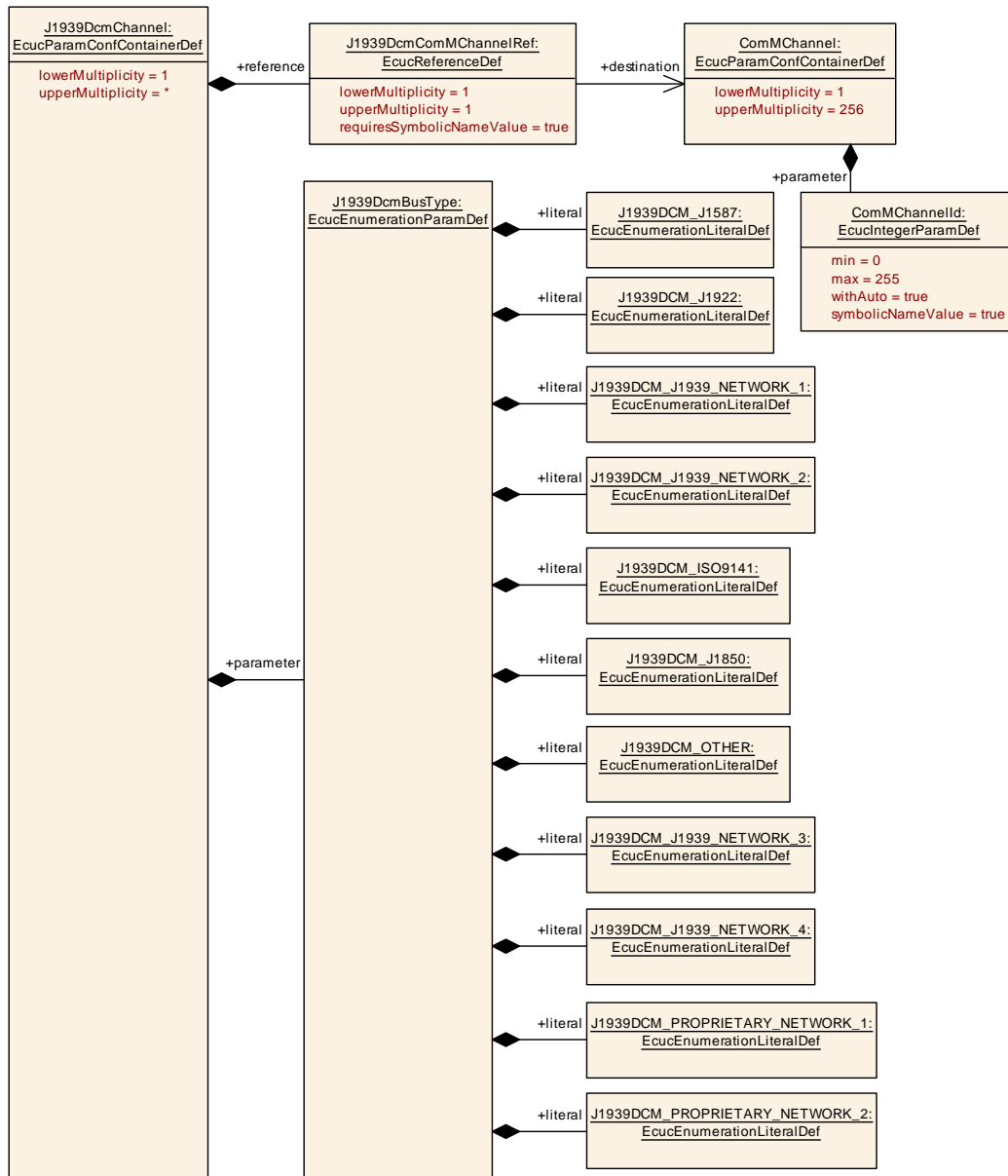


Figure 10.3: Configuration of Channels

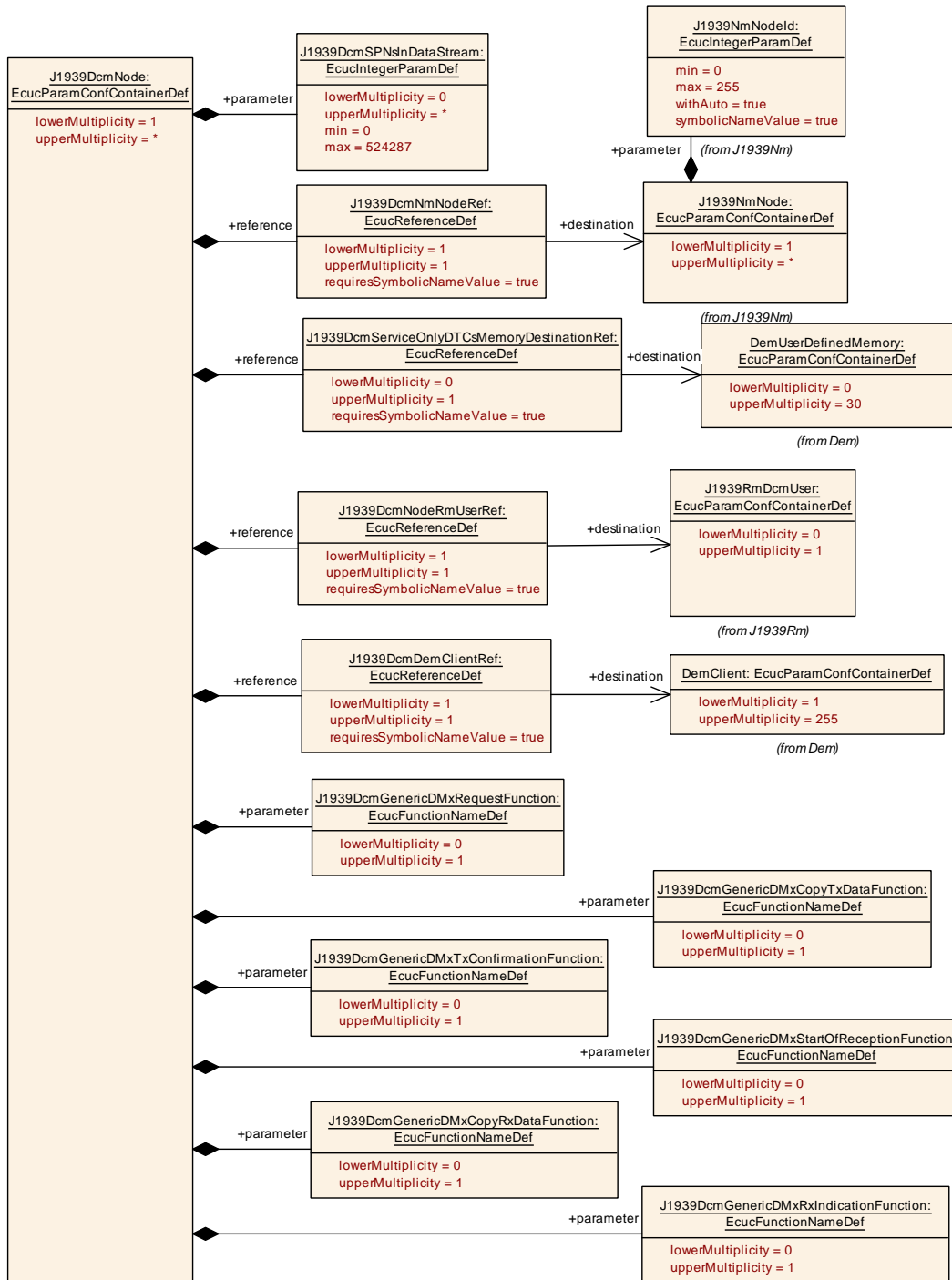


Figure 10.4: Configuration of Nodes - Part 1

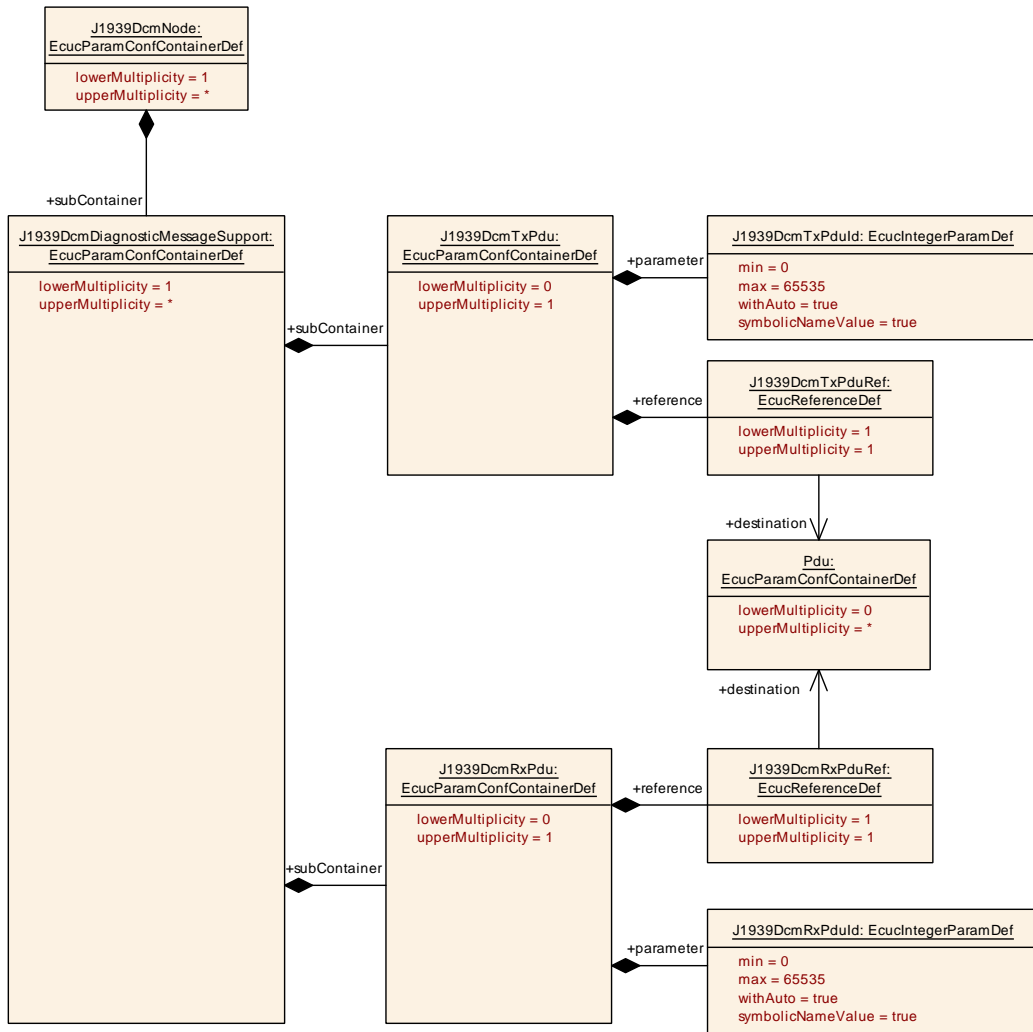


Figure 10.5: Configuration of Nodes - Part 2

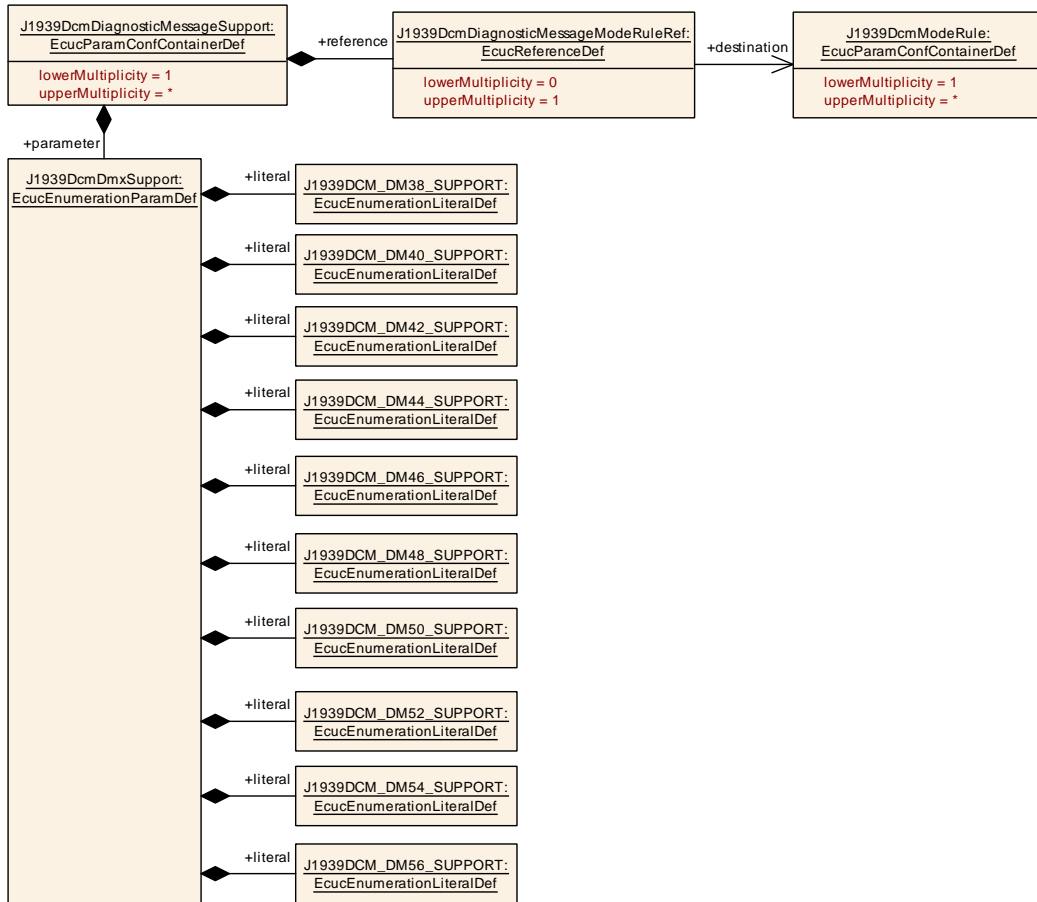


Figure 10.7: Configuration of Diagnostic Messages - Part 2

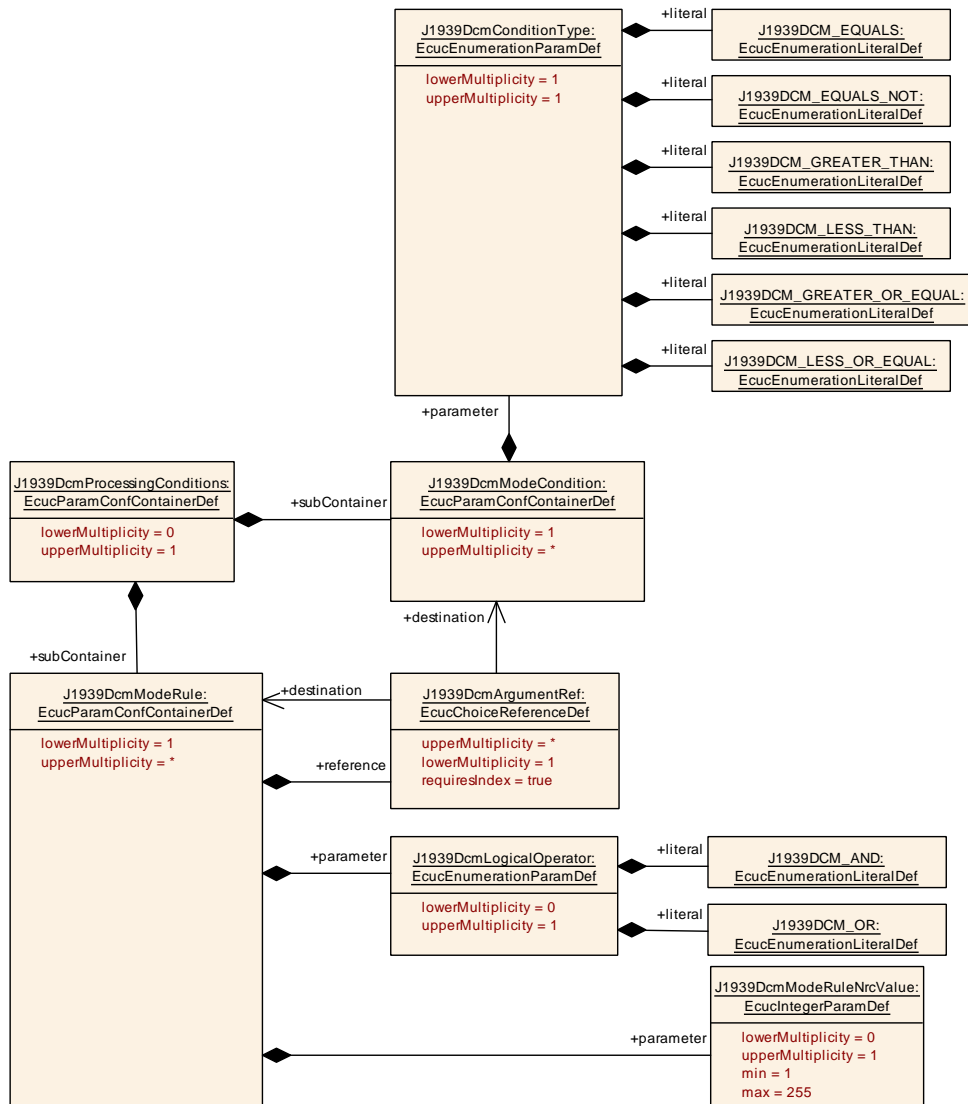


Figure 10.8: Configuration of Processing Conditions - Part 1

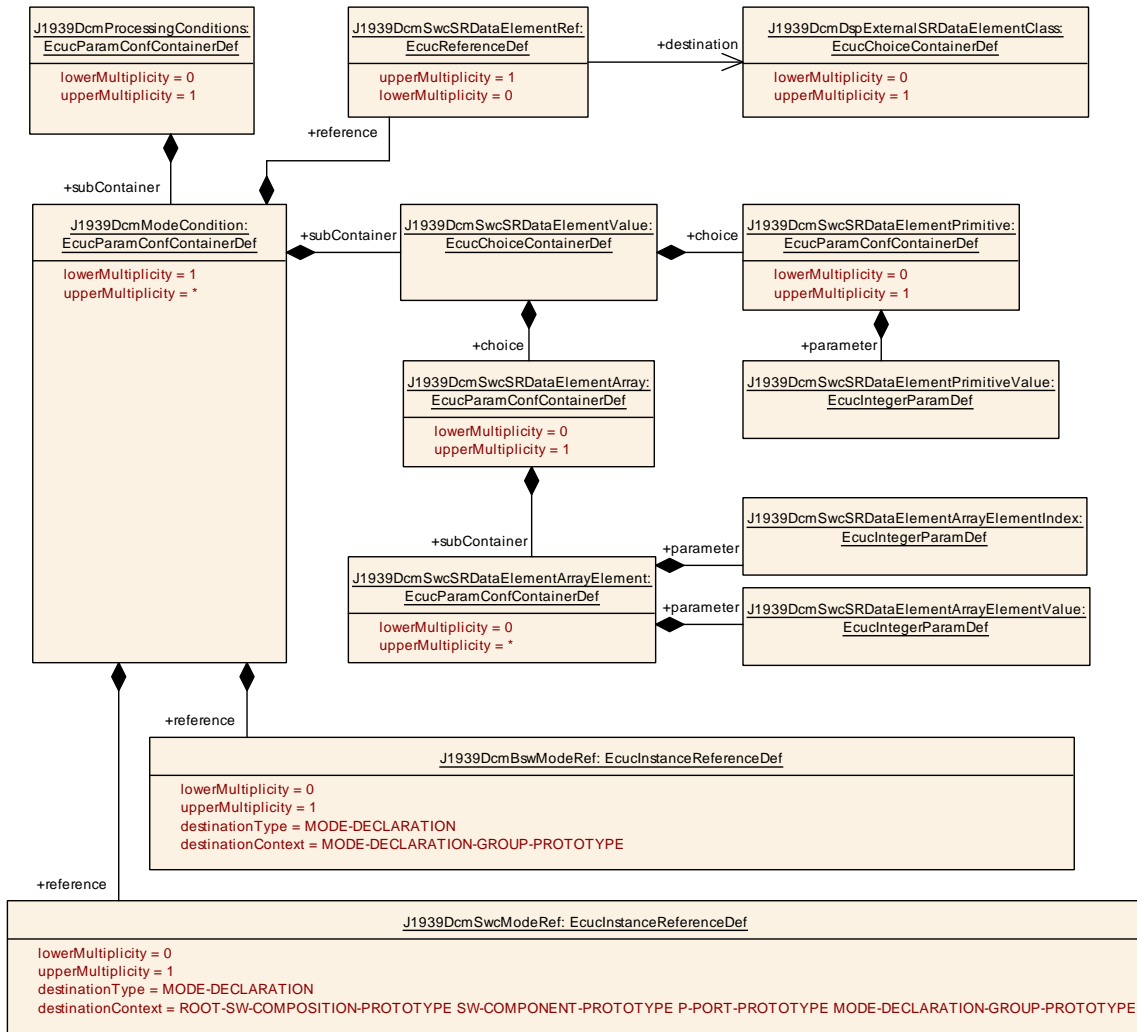


Figure 10.9: Configuration of Processing Conditions - Part 2

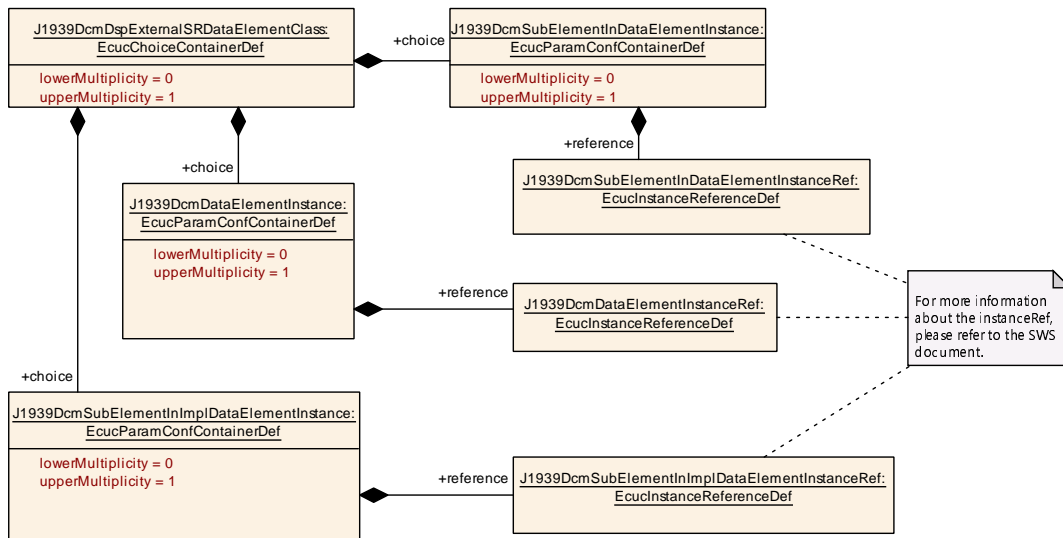


Figure 10.10: Configuration of External Data Element Class

10.1.1 J1939Dcm

[ECUC_J1939Dcm_00005] Definition of EcucModuleDef J1939Dcm [

Module Name	J1939Dcm
Description	The SAE J1939 Dcm module
Post-Build Variant Support	true
Supported Config Variants	VARIANT-LINK-TIME, VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmConfigSet	1	This container contains the configuration parameters and sub containers of the AUTOSAR J1939Dcm module.
J1939DcmGeneral	1	Contains the general configuration parameters of the module.

]

10.1.2 J1939DcmGeneral

[ECUC_J1939Dcm_00001] Definition of EcucParamConfContainerDef J1939Dcm General [

Container Name	J1939DcmGeneral
Parent Container	J1939Dcm
Description	Contains the general configuration parameters of the module.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmCommonBufferSize	1	[ECUC_J1939Dcm_00040]
J1939DcmDevErrorDetect	1	[ECUC_J1939Dcm_00003]
J1939DcmDM01BufferSize	0..1	[ECUC_J1939Dcm_00041]
J1939DcmDM01MaxDTCs	0..1	[ECUC_J1939Dcm_00050]
J1939DcmDM35BufferSize	0..1	[ECUC_J1939Dcm_00073]
J1939DcmGenericDMxSupport	1	[ECUC_J1939Dcm_00081]
J1939DcmMainFunctionPeriod	1	[ECUC_J1939Dcm_00004]
J1939DcmMaxDTCsPerMainFunction	0..1	[ECUC_J1939Dcm_00006]
J1939DcmMaxFreezeFramesPerMainFunction	0..1	[ECUC_J1939Dcm_00007]
J1939DcmMaxRatiosPerMainFunction	0..1	[ECUC_J1939Dcm_00008]
J1939DcmMaxTransmitRetries	1	[ECUC_J1939Dcm_00088]
J1939DcmVersionInfoApi	1	[ECUC_J1939Dcm_00002]

No Included Containers

]

[ECUC_J1939Dcm_00040] Definition of EcucIntegerParamDef J1939DcmCommonBufferSize [

Parameter Name	J1939DcmCommonBufferSize		
Parent Container	J1939DcmGeneral		
Description	Size of common buffer (in Bytes). The buffer size should be as large as the longest command or response message.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	1 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00003] Definition of EcucBooleanParamDef J1939DcmDevErrorDetect [

Parameter Name	J1939DcmDevErrorDetect		
Parent Container	J1939DcmGeneral		
Description	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> • true: detection and notification is enabled. • false: detection and notification is disabled. 		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00041] Definition of EcucIntegerParamDef J1939DcmDM01BufferSize [

Parameter Name	J1939DcmDM01BufferSize		
Parent Container	J1939DcmGeneral		
Description	Size of DM01 buffer (in Bytes). The buffer size should be as large as the longest DM01 response message.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		





Range	1 .. 65535		
Default value	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local dependency: Shall be present if J1939DcmDmxSupport is set to J1939DCM_DM01_SUPPORT for at least one J1939DcmDiagnosticMessageSupport.		

]

[ECUC_J1939Dcm_00050] Definition of EcucIntegerParamDef J1939DcmDM01MaxDTCs [

Parameter Name	J1939DcmDM01MaxDTCs		
Parent Container	J1939DcmGeneral		
Description	Configuration value of limitation of maximum DTCs to be reported in the DM01 message.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	20		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local dependency: Shall be present if J1939DcmDmxSupport is set to J1939DCM_DM01_SUPPORT for at least one J1939DcmDiagnosticMessageSupport.		

]

[ECUC_J1939Dcm_00073] Definition of EcucIntegerParamDef J1939DcmDM35BufferSize [

Parameter Name	J1939DcmDM35BufferSize		
Parent Container	J1939DcmGeneral		
Description	Size of DM35 buffer (in Bytes). The buffer size should be as large as the longest DM35 response message.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 65535		





Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00081] Definition of EcucBooleanParamDef J1939DcmGenericDMxSupport [

Parameter Name	J1939DcmGenericDMxSupport		
Parent Container	J1939DcmGeneral		
Description	Switches the support for all DMx messages that are not directly implemented in J1939Dcm. True: Unsupported DMx messages are handled by a CDD. False: Unsupported DMx messages are ignored/rejected.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00004] Definition of EcucFloatParamDef J1939DcmMainFunctionPeriod [

Parameter Name	J1939DcmMainFunctionPeriod		
Parent Container	J1939DcmGeneral		
Description	Call cycle in seconds of J1939Dcm_MainFunction.		
Multiplicity	1		
Type	EcucFloatParamDef		
Range]0 .. INF[
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	-	





Scope / Dependency	scope: ECU
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[ECUC_J1939Dcm_00006] Definition of EcucIntegerParamDef J1939DcmMaxDTCsPerMainFunction ┌

Parameter Name	J1939DcmMaxDTCsPerMainFunction		
Parent Container	J1939DcmGeneral		
Description	Maximum threshold of DTCs filtered in a single MainFunction cycle.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

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[ECUC_J1939Dcm_00007] Definition of EcucIntegerParamDef J1939DcmMaxFreezeFramesPerMainFunction ┌

Parameter Name	J1939DcmMaxFreezeFramesPerMainFunction		
Parent Container	J1939DcmGeneral		
Description	Maximum threshold of FreezeFrames filtered in a single MainFunction cycle.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

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[ECUC_J1939Dcm_00008] Definition of EcucIntegerParamDef J1939DcmMaxRatiosPerMainFunction [

Parameter Name	J1939DcmMaxRatiosPerMainFunction		
Parent Container	J1939DcmGeneral		
Description	Maximum threshold of Ratios filtered in a single MainFunction cycle.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00088] Definition of EcucIntegerParamDef J1939DcmMaxTransmitRetries [

Parameter Name	J1939DcmMaxTransmitRetries		
Parent Container	J1939DcmGeneral		
Description	Maximum number of retries to send a diagnostic message in case PduR_J1939Dcm Transmit returns E_NOT_OK.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	10		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00002] Definition of EcucBooleanParamDef J1939DcmVersionInfoApi [

Parameter Name	J1939DcmVersionInfoApi		
Parent Container	J1939DcmGeneral		
Description	Pre-processor switch for enabling version info API support.		



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Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.3 J1939DcmConfigSet

[ECUC_J1939Dcm_00009] Definition of EcucParamConfContainerDef J1939Dcm ConfigSet [

Container Name	J1939DcmConfigSet
Parent Container	J1939Dcm
Description	This container contains the configuration parameters and sub containers of the AUTOSAR J1939Dcm module.
Configuration Parameters	

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmChannel	1..*	Contains the J1939DcmChannel parameters.
J1939DcmDspExternalSRDataElementClass	0..1	This container defines the source of data in a provided port which shall be read respectively the target of data in a required port which shall be written. This container shall contain either one J1939DcmSubElementInDataElementInstance OR J1939DcmDataElementInstance OR J1939DcmSubElementInImplDataElementInstance reference.
J1939DcmNode	1..*	Contains the parameters for the support of a logical J1939 node.
J1939DcmProcessingConditions	0..1	This container contains the configuration for mode arbitration functionality of the J1939Dcm

]

10.1.4 J1939DcmChannel

[ECUC_J1939Dcm_00011] Definition of EcucParamConfContainerDef J1939Dcm Channel [

Container Name	J1939DcmChannel
Parent Container	J1939DcmConfigSet
Description	Contains the J1939DcmChannel parameters.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmBusType	1	[ECUC_J1939Dcm_00039]
J1939DcmComMChannelRef	1	[ECUC_J1939Dcm_00038]

No Included Containers

]

[[ECUC_J1939Dcm_00039](#)] Definition of EcucEnumerationParamDef J1939DcmBusType [

Parameter Name	J1939DcmBusType		
Parent Container	J1939DcmChannel		
Description	Identifies the communication port		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	J1939DCM_ISO9141	Identifies the ISO 9141 communications port.	
	J1939DCM_J1587	Identifies the J1587 communication port.	
	J1939DCM_J1850	Identifies the J1850 communication port.	
	J1939DCM_J1922	Identifies the J1922 communication port.	
	J1939DCM_J1939_NETWORK_1	Identifies the J1939 Network #1, Primary Vehicle Network communication port.	
	J1939DCM_J1939_NETWORK_2	Identifies the J1939 Network #2 communication port.	
	J1939DCM_J1939_NETWORK_3	Identifies the J1939 Network #3 communication port.	
	J1939DCM_J1939_NETWORK_4	Identifies the J1939 Network #4 communication port.	
	J1939DCM_OTHER	Identifies the "Other, Manufacture Specified Port" communication port.	
	J1939DCM_PROPRIETARY_NETWORK_1	Identifies the Proprietary Network #1 communication port.	
	J1939DCM_PROPRIETARY_NETWORK_2	Identifies the Proprietary Network #2 communication port.	
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00038] Definition of EcucReferenceDef J1939DcmComMChannelRef

Parameter Name	J1939DcmComMChannelRef		
Parent Container	J1939DcmChannel		
Description	Reference to the ComMChannel.		
Multiplicity	1		
Type	Symbolic name reference to ComMChannel		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

10.1.5 J1939DcmNode

[ECUC_J1939Dcm_00010] Definition of EcucParamConfContainerDef J1939DcmNode

Container Name	J1939DcmNode
Parent Container	J1939DcmConfigSet
Description	Contains the parameters for the support of a logical J1939 node.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmGenericDMxCopyRxDataFunction	0..1	[ECUC_J1939Dcm_00086]
J1939DcmGenericDMxCopyTxDataFunction	0..1	[ECUC_J1939Dcm_00083]
J1939DcmGenericDMxRequestFunction	0..1	[ECUC_J1939Dcm_00082]
J1939DcmGenericDMxRxIndicationFunction	0..1	[ECUC_J1939Dcm_00087]
J1939DcmGenericDMxStartOfReceptionFunction	0..1	[ECUC_J1939Dcm_00085]
J1939DcmGenericDMxTxConfirmationFunction	0..1	[ECUC_J1939Dcm_00084]
J1939DcmSPNsInDataStream	0..*	[ECUC_J1939Dcm_00047]
J1939DcmDemClientRef	1	[ECUC_J1939Dcm_00072]
J1939DcmNmNodeRef	1	[ECUC_J1939Dcm_00013]
J1939DcmNodeRmUserRef	1	[ECUC_J1939Dcm_00049]
J1939DcmServiceOnlyDTCsMemoryDestinationRef	0..1	[ECUC_J1939Dcm_00051]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmDiagnosticMessageSupport	1..*	Contains parameters to configure the diagnostic message support

]

[ECUC_J1939Dcm_00086] Definition of EcucFunctionNameDef J1939DcmGenericDMxCopyRxDataFunction [

Parameter Name	J1939DcmGenericDMxCopyRxDataFunction		
Parent Container	J1939DcmNode		
Description	Provides part of the data of an unsupported DMx message. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00083] Definition of EcucFunctionNameDef J1939DcmGenericDMxCopyTxDataFunction [

Parameter Name	J1939DcmGenericDMxCopyTxDataFunction		
Parent Container	J1939DcmNode		
Description	Requests to provide part of the data of an unsupported DMx message, following a call to J1939Dcm_GenericDMxTransmit. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00082] Definition of EcucFunctionNameDef J1939DcmGenericDMxRequestFunction [

Parameter Name	J1939DcmGenericDMxRequestFunction		
Parent Container	J1939DcmNode		
Description	Indicates the reception of a request for an unsupported DMx message. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00087] Definition of EcucFunctionNameDef J1939DcmGenericDMxRxIndicationFunction [

Parameter Name	J1939DcmGenericDMxRxIndicationFunction		
Parent Container	J1939DcmNode		
Description	Confirms complete reception of an unsupported DMx message. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00085] Definition of EcucFunctionNameDef J1939DcmGenericDMxStartOfReceptionFunction [

Parameter Name	J1939DcmGenericDMxStartOfReceptionFunction		
Parent Container	J1939DcmNode		
Description	Indicates reception of an unsupported DMx message. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00084] Definition of EcucFunctionNameDef J1939DcmGenericDMxTxConfirmationFunction [

Parameter Name	J1939DcmGenericDMxTxConfirmationFunction		
Parent Container	J1939DcmNode		
Description	Confirms transmission of an unsupported DMx message. Required if J1939DcmGenericDMxSupport is enabled.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00047] Definition of EcucIntegerParamDef J1939DcmSPNsInDataStream [

Parameter Name	J1939DcmSPNsInDataStream		
Parent Container	J1939DcmNode		
Description	Defines the SPNs available in data stream for use in DM24.		
Multiplicity	0..*		
Type	EcucIntegerParamDef		
Range	0 .. 524287		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00072] Definition of EcucReferenceDef J1939DcmDemClientRef [

Parameter Name	J1939DcmDemClientRef		
Parent Container	J1939DcmNode		
Description	Reference to the corresponding Dem Client.		
Multiplicity	1		
Type	Symbolic name reference to DemClient		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00013] Definition of EcucReferenceDef J1939DcmNmNodeRef [

Parameter Name	J1939DcmNmNodeRef		
Parent Container	J1939DcmNode		
Description	Reference to the corresponding J1939Nm node.		
Multiplicity	1		
Type	Symbolic name reference to J1939NmNode		

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Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00049] Definition of EcucReferenceDef J1939DcmNodeRmUserRef [

Parameter Name	J1939DcmNodeRmUserRef		
Parent Container	J1939DcmNode		
Description	Reference to the J1939RmUser used by J1939Dcm.		
Multiplicity	1		
Type	Symbolic name reference to J1939RmDcmUser		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00051] Definition of EcucReferenceDef J1939DcmServiceOnlyDTCsMemoryDestinationRef [

Parameter Name	J1939DcmServiceOnlyDTCsMemoryDestinationRef		
Parent Container	J1939DcmNode		
Description	Reference to the user defined memory used for the Service Only DTCs handled by DM53, DM54, and DM55.		
Multiplicity	0..1		
Type	Symbolic name reference to DemUserDefinedMemory		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local dependency: The referenced event memory shall be assigned to the DemEvent MemorySet of the DemClient referenced by J1939DcmDemClientRef.		

]

10.1.6 J1939DcmDiagnosticMessageSupport

[ECUC_J1939Dcm_00014] Definition of EcucParamConfContainerDef J1939DcmDiagnosticMessageSupport [

Container Name	J1939DcmDiagnosticMessageSupport
Parent Container	J1939DcmNode
Description	Contains parameters to configure the diagnostic message support
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmDmxSupport	1	[ECUC_J1939Dcm_00042]
J1939DcmDiagnosticMessageModeRuleRef	0..1	[ECUC_J1939Dcm_00070]
J1939DcmDiagnosticMessageSupportChannelRef	1	[ECUC_J1939Dcm_00048]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmRxPdu	0..1	Contains parameters to configure the J1939DcmRxPdu. This PDU consumes meta data items of type CAN_ID_32 for PDUs received from CanIf, and of type SOURCE_ADDRESS_16, TARGET_ADDRESS_16, and PRIORITY_8 for PDUs received from J1939Tp.
J1939DcmTxPdu	0..1	Contains parameters to configure the J1939DcmTxPdu. This PDU produces meta data items of type CAN_ID_32 for PDUs transmitted via CanIf, and of type SOURCE_ADDRESS_16, TARGET_ADDRESS_16, and PRIORITY_8 for PDUs transmitted via J1939Tp.

]

[ECUC_J1939Dcm_00042] Definition of EcucEnumerationParamDef J1939DcmDmxSupport [

Parameter Name	J1939DcmDmxSupport	
Parent Container	J1939DcmDiagnosticMessageSupport	
Description	This parameter is used to identify the actual DMx message.	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	J1939DCM_DM01_SUPPORT	DM01: Active Diagnostic Trouble Codes
	J1939DCM_DM02_SUPPORT	DM02: Previously Active Diagnostic Trouble Codes
	J1939DCM_DM03_SUPPORT	DM03: Diagnostic Data Clear/Reset for Previously Active DTCs
	J1939DCM_DM04_SUPPORT	DM04: Freeze Frame Parameters
	J1939DCM_DM05_SUPPORT	DM05: Diagnostic Readiness 1
	J1939DCM_DM06_SUPPORT	DM06: Emission Related Pending DTCs





J1939DCM_DM07_SUPPORT	DM07: Command Non-continuously Monitored Test
J1939DCM_DM08_SUPPORT	DM08: Test Results for Non-continuously Monitored Systems
J1939DCM_DM09_SUPPORT	DM09: Oxygen Sensor Test Results
J1939DCM_DM10_SUPPORT	DM10: Non-continuously Monitored System Test Identifiers Support
J1939DCM_DM11_SUPPORT	DM11: Diagnostic Data Clear/Reset for Active DTCs
J1939DCM_DM12_SUPPORT	DM12: Emissions Related Active DTCs
J1939DCM_DM13_SUPPORT	DM13: Stop Start Broadcast
J1939DCM_DM14_SUPPORT	DM14: Memory Access Request
J1939DCM_DM15_SUPPORT	DM15: Memory Access Response
J1939DCM_DM16_SUPPORT	DM16: Binary Data Transfer
J1939DCM_DM17_SUPPORT	DM17: Boot Load Data
J1939DCM_DM18_SUPPORT	DM18: Data Security
J1939DCM_DM19_SUPPORT	DM19: Calibration Information
J1939DCM_DM20_SUPPORT	DM20: Monitor Performance Ratio
J1939DCM_DM21_SUPPORT	DM21: Diagnostic Readiness 2
J1939DCM_DM22_SUPPORT	DM22: Individual Clear/Reset of Active and Previously Active DTC
J1939DCM_DM23_SUPPORT	DM23: Emission Related Previously Active DTCs
J1939DCM_DM24_SUPPORT	DM24: SPN Support
J1939DCM_DM25_SUPPORT	DM25: Expanded Freeze Frame
J1939DCM_DM26_SUPPORT	DM26: Diagnostic Readiness 3
J1939DCM_DM27_SUPPORT	DM27: All Pending DTCs
J1939DCM_DM28_SUPPORT	DM28: Permanent DTCs
J1939DCM_DM29_SUPPORT	DM29: Regulated DTC Counts
J1939DCM_DM30_SUPPORT	DM30: Scaled Test Results
J1939DCM_DM31_SUPPORT	DM31: DTC to Lamp Association
J1939DCM_DM32_SUPPORT	DM32: Regulated Exhaust Emission Level Exceedance
J1939DCM_DM33_SUPPORT	DM33: Emission Increasing Auxiliary Emission Control Device Active Time
J1939DCM_DM34_SUPPORT	DM34: NTE Status
J1939DCM_DM35_SUPPORT	iDM35: Immediate Fault Status
J1939DCM_DM36_SUPPORT	DM36: Harmonized Roadworthiness - Vehicle (HRVV)
J1939DCM_DM37_SUPPORT	DM37: Harmonized Roadworthiness - System (HRWS)
J1939DCM_DM38_SUPPORT	DM38: Harmonized Global Regulation Description (HGRD)
J1939DCM_DM39_SUPPORT	DM39: Harmonized Cumulative Continuous Malfunction Indicator - System (HCM)
J1939DCM_DM40_SUPPORT	DM40: Harmonized B1 Failure Counts (HB1C)
J1939DCM_DM41_SUPPORT	DM41: DTCs - A, Pending
J1939DCM_DM42_SUPPORT	DM42: DTCs - A, Confirmed and Active
J1939DCM_DM43_SUPPORT	DM43: DTCs - A, Previously Active
J1939DCM_DM44_SUPPORT	DM44: DTCs - B1, Pending



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	J1939DCM_DM45_SUPPORT	DM45: DTCs - B1, Confirmed and Active	
	J1939DCM_DM46_SUPPORT	DM46: DTCs - B1, Previously Active	
	J1939DCM_DM47_SUPPORT	DM47: DTCs - B2, Pending	
	J1939DCM_DM48_SUPPORT	DM48: DTCs - B2, Confirmed and Active	
	J1939DCM_DM49_SUPPORT	DM49: DTCs - B2, Previously Active	
	J1939DCM_DM50_SUPPORT	DM50: DTCs - C, Pending	
	J1939DCM_DM51_SUPPORT	DM51: DTCs - C, Confirmed and Active	
	J1939DCM_DM52_SUPPORT	DM52: DTCs - C, Previously Active	
	J1939DCM_DM53_SUPPORT	DM53: Active Service Only DTCs	
	J1939DCM_DM54_SUPPORT	DM54: Previously Active Service Only DTCs	
	J1939DCM_DM55_SUPPORT	DM55: Clear All Service Only DTCs	
	J1939DCM_DM56_SUPPORT	DM56: Engine Emissions Certification Information	
	J1939DCM_DM57_SUPPORT	DM57: OBD Information	
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00070] Definition of EcucReferenceDef J1939DcmDiagnosticMessageModeRuleRef [

Parameter Name	J1939DcmDiagnosticMessageModeRuleRef		
Parent Container	J1939DcmDiagnosticMessageSupport		
Description	Reference to a J1939DcmModeRule which controls the execution of a Diagnostic Message.		
Multiplicity	0..1		
Type	Reference to J1939DcmModeRule		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE, VARIANT-POST-BUILD
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

**[ECUC_J1939Dcm_00048] Definition of EcucReferenceDef J1939DcmDiagnostic
 MessageSupportChannelRef** [

Parameter Name	J1939DcmDiagnosticMessageSupportChannelRef		
Parent Container	J1939DcmDiagnosticMessageSupport		
Description	Reference to J1939DcmChannel for which this diagnostic message is supported.		
Multiplicity	1		
Type	Reference to J1939DcmChannel		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.7 J1939DcmRxPdu

**[ECUC_J1939Dcm_00046] Definition of EcucParamConfContainerDef J1939Dcm
 RxPdu** [

Container Name	J1939DcmRxPdu
Parent Container	J1939DcmDiagnosticMessageSupport
Description	Contains parameters to configure the J1939DcmRxPdu. This PDU consumes meta data items of type CAN_ID_32 for PDUs received from Can If, and of type SOURCE_ADDRESS_16, TARGET_ADDRESS_16, and PRIORITY_8 for PDUs received from J1939Tp.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmRxPduId	1	[ECUC_J1939Dcm_00016]
J1939DcmRxPduRef	1	[ECUC_J1939Dcm_00017]

No Included Containers

]

[ECUC_J1939Dcm_00016] Definition of EcucIntegerParamDef J1939DcmRxPduId [

Parameter Name	J1939DcmRxPduId		
Parent Container	J1939DcmRxPdu		
Description	The I-PDU identifier used for communication with PduR.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU withAuto = true		

]

[ECUC_J1939Dcm_00017] Definition of EcucReferenceDef J1939DcmRxPduRef

[

Parameter Name	J1939DcmRxPduRef		
Parent Container	J1939DcmRxPdu		
Description	Reference to the global Pdu element in the Ecuc module.		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.8 J1939DcmTxPdu

[ECUC_J1939Dcm_00045] Definition of EcucParamConfContainerDef J1939DcmTxPdu [

Container Name	J1939DcmTxPdu
Parent Container	J1939DcmDiagnosticMessageSupport
Description	Contains parameters to configure the J1939DcmTxPdu. This PDU produces meta data items of type CAN_ID_32 for PDUs transmitted via Can If, and of type SOURCE_ADDRESS_16, TARGET_ADDRESS_16, and PRIORITY_8 for PDUs transmitted via J1939Tp.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmTxPduId	1	[ECUC_J1939Dcm_00044]
J1939DcmTxPduRef	1	[ECUC_J1939Dcm_00043]

No Included Containers

]

[ECUC_J1939Dcm_00044] Definition of EcucIntegerParamDef J1939DcmTxPduId [

Parameter Name	J1939DcmTxPduId		
Parent Container	J1939DcmTxPdu		
Description	The I-PDU identifier used to identify the Tx message.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU withAuto = true		

]

[ECUC_J1939Dcm_00043] Definition of EcucReferenceDef J1939DcmTxPduRef [

Parameter Name	J1939DcmTxPduRef		
Parent Container	J1939DcmTxPdu		
Description	Reference to the global Pdu element in the Ecuc module.		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE



△

	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.9 J1939DcmProcessingConditions

[ECUC_J1939Dcm_00052] Definition of EcucParamConfContainerDef J1939Dcm ProcessingConditions [

Container Name	J1939DcmProcessingConditions
Parent Container	J1939DcmConfigSet
Description	This container contains the configuration for mode arbitration functionality of the J1939Dcm
Configuration Parameters	

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmModeCondition	1..*	<p>This container contains the configuration of a mode condition or an environmental conditions which can be used as argument in J1939DcmModeRules.</p> <p>One J1939DcmModeCondition shall contain either one J1939DcmSwcModeRef or one J1939DcmBswModeRef or one J1939DcmSwcSRDataElementRef.</p> <p>Please note that the J1939Dcm acts as well as mode manager. Therefore the references J1939DcmSwcModeRef or one J1939DcmBswModeRef might point to provided Mode DeclarationGroupPrototypes of the J1939Dcm itself as well as to provided ModeDeclarationGroupPrototypes of other Bsw Modules or software components.</p> <p>In case of a configured J1939DcmSwcModeRef or J1939DcmBswModeRef only the J1939DcmConditionType J1939DCM_EQUALS or J1939DCM_EQUALS_NOT are applicable.</p> <p>In case of J1939DcmSwcSRDataElementRef all literals of J1939DcmConditionType are possible.</p>
J1939DcmModeRule	1..*	<p>This container contains the configuration of a mode rule which represents a logical expression with J1939DcmModeConditions or other J1939DcmModeRules as arguments.</p> <p>All arguments are processed with the operator defined by Dcm LogicalOperator, for instance: Argument_A AND Argument_B AND Argument_C</p>

]

10.1.10 J1939DcmModeRule

[ECUC_J1939Dcm_00053] Definition of EcucParamConfContainerDef J1939Dcm ModeRule [

Container Name	J1939DcmModeRule
Parent Container	J1939DcmProcessingConditions
Description	<p>This container contains the configuration of a mode rule which represents a logical expression with J1939DcmModeConditions or other J1939DcmModeRules as arguments.</p> <p>All arguments are processed with the operator defined by DcmLogicalOperator, for instance: Argument_A AND Argument_B AND Argument_C</p>
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmLogicalOperator	0..1	[ECUC_J1939Dcm_00054]
J1939DcmModeRuleNrcValue	0..1	[ECUC_J1939Dcm_00056]
J1939DcmArgumentRef	1..*	[ECUC_J1939Dcm_00055]

No Included Containers

]

[ECUC_J1939Dcm_00054] Definition of EcucEnumerationParamDef J1939Dcm LogicalOperator [

Parameter Name	J1939DcmLogicalOperator		
Parent Container	J1939DcmModeRule		
Description	This parameter specifies the logical operator to be used in the logical expression. If the expression only consists of a single condition this parameter shall not be used.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	J1939DCM_AND	–	
	J1939DCM_OR	–	
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00056] Definition of EcucIntegerParamDef J1939DcmModeRuleNrcValue [

Parameter Name	J1939DcmModeRuleNrcValue		
Parent Container	J1939DcmModeRule		
Description	Optional parameter which defines the NRC to be sent in case the mode rule condition is not valid.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

[ECUC_J1939Dcm_00055] Definition of EcucChoiceReferenceDef J1939DcmArgumentRef [

Parameter Name	J1939DcmArgumentRef		
Parent Container	J1939DcmModeRule		
Description	This is a choice reference either to a mode condition or a an other mode rule serving as sub-expression. Attributes: requiresIndex=true		
Multiplicity	1..*		
Type	Choice reference to [J1939DcmModeCondition , J1939DcmModeRule]		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.11 J1939DcmModeCondition

[ECUC_J1939Dcm_00071] Definition of EcucParamConfContainerDef J1939Dcm ModeCondition [

Container Name	J1939DcmModeCondition
Parent Container	J1939DcmProcessingConditions
Description	<p>This container contains the configuration of a mode condition or an environmental conditions which can be used as argument in J1939DcmModeRules.</p> <p>One J1939DcmModeCondition shall contain either one J1939DcmSwcModeRef or one J1939DcmBswModeRef or one J1939DcmSwcSRDataElementRef.</p> <p>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.</p> <p>In case of a configured J1939DcmSwcModeRef or J1939DcmBswModeRef only the J1939DcmConditionType J1939DCM_EQUALS or J1939DCM_EQUALS_NOT are applicable.</p> <p>In case of J1939DcmSwcSRDataElementRef all literals of J1939DcmConditionType are possible.</p>
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmConditionType	1	[ECUC_J1939Dcm_00057]
J1939DcmBswModeRef	0..1	[ECUC_J1939Dcm_00059]
J1939DcmSwcModeRef	0..1	[ECUC_J1939Dcm_00058]
J1939DcmSwcSRDataElementRef	0..1	[ECUC_J1939Dcm_00060]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmSwcSRDataElement Value	1	This container contains the configuration of a S/R compare value.

]

[ECUC_J1939Dcm_00057] Definition of EcucEnumerationParamDef J1939Dcm ConditionType [

Parameter Name	J1939DcmConditionType	
Parent Container	J1939DcmModeCondition	
Description	This parameter specifies what kind of comparison that is made for the evaluation of the mode condition.	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	J1939DCM_EQUALS	–
	J1939DCM_EQUALS_NOT	–





	J1939DCM_GREATER_OR_EQUAL	–	
	J1939DCM_GREATER_THAN	–	
	J1939DCM_LESS_OR_EQUAL	–	
	J1939DCM_LESS_THAN	–	
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00059] Definition of EcucInstanceReferenceDef J1939DcmBswModeRef [

Parameter Name	J1939DcmBswModeRef		
Parent Container	J1939DcmModeCondition		
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.		
Multiplicity	0..1		
Type	Instance reference to MODE-DECLARATION context: MODE-DECLARATION-GROUP-PROTOTYPE		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00058] Definition of EcucInstanceReferenceDef J1939DcmSwcModeRef [

Parameter Name	J1939DcmSwcModeRef		
Parent Container	J1939DcmModeCondition		
Description	This parameter references a mode in a particular mode request port of a software component that is used for the condition.		
Multiplicity	0..1		





Type	Instance reference to MODE-DECLARATION context: ROOT-SW-COMPOSITION-PROTOTYPE SW-COMPONENT-PROTOTYPE P-PORT-PROTOTYPE MODE-DECLARATION-GROUP-PROTOTYPE		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_J1939Dcm_00060] Definition of EcucReferenceDef J1939DcmSwcSR-DataElementRef [

Parameter Name	J1939DcmSwcSRDataElementRef		
Parent Container	J1939DcmModeCondition		
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.		
Multiplicity	0..1		
Type	Reference to J1939DcmDspExternalSRDataElementClass		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.12 J1939DcmSwcSRDataElementValue

[ECUC_J1939Dcm_00074] Definition of EcucChoiceContainerDef J1939DcmSwcSRDataElementValue [

Choice Container Name	J1939DcmSwcSRDataElementValue
Parent Container	J1939DcmModeCondition
Description	This container contains the configuration of a S/R compare value.

No Included Parameters

Container Choices		
Container Name	Multiplicity	Scope / Dependency
J1939DcmSwcSRDataElementArray	0..1	This container contains the configuration of a array SR data element compare value.
J1939DcmSwcSRDataElementPrimitive	0..1	This container contains the configuration of a primitive SR data element compare value.

]

10.1.13 J1939DcmSwcSRDataElementPrimitive

[ECUC_J1939Dcm_00075] Definition of EcucParamConfContainerDef J1939DcmSwcSRDataElementPrimitive [

Container Name	J1939DcmSwcSRDataElementPrimitive
Parent Container	J1939DcmSwcSRDataElementValue
Description	This container contains the configuration of a primitive SR data element compare value.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmSwcSRDataElementPrimitiveValue	1	[ECUC_J1939Dcm_00077]

No Included Containers

]

[ECUC_J1939Dcm_00077] Definition of EcucIntegerParamDef J1939DcmSwcSRDataElementPrimitiveValue [

Parameter Name	J1939DcmSwcSRDataElementPrimitiveValue		
Parent Container	J1939DcmSwcSRDataElementPrimitive		
Description	Reference to a primitive SR data element compare value.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	





Scope / Dependency	
---------------------------	--

]

10.1.14 J1939DcmSwcSRDataElementArray

[ECUC_J1939Dcm_00076] Definition of EcucParamConfContainerDef J1939DcmSwcSRDataElementArray [

Container Name	J1939DcmSwcSRDataElementArray
Parent Container	J1939DcmSwcSRDataElementValue
Description	This container contains the configuration of a array SR data element compare value.
Configuration Parameters	

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
J1939DcmSwcSRDataElementArrayElement	0..*	This container contains the configuration of a array element SR data element compare value.

]

10.1.15 J1939DcmSwcSRDataElementArrayElement

[ECUC_J1939Dcm_00080] Definition of EcucParamConfContainerDef J1939DcmSwcSRDataElementArrayElement [

Container Name	J1939DcmSwcSRDataElementArrayElement
Parent Container	J1939DcmSwcSRDataElementArray
Description	This container contains the configuration of a array element SR data element compare value.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmSwcSRDataElementArrayElementIndex	1	[ECUC_J1939Dcm_00078]
J1939DcmSwcSRDataElementArrayElementValue	1	[ECUC_J1939Dcm_00079]

No Included Containers

]

[ECUC_J1939Dcm_00078] Definition of EcucIntegerParamDef J1939DcmSwcSR-DataElementArrayElementIndex [

Parameter Name	J1939DcmSwcSRDataElementArrayElementIndex		
Parent Container	J1939DcmSwcSRDataElementArrayElement		
Description	Index to an array SR data element.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency			

]

[ECUC_J1939Dcm_00079] Definition of EcucIntegerParamDef J1939DcmSwcSR-DataElementArrayElementValue [

Parameter Name	J1939DcmSwcSRDataElementArrayElementValue		
Parent Container	J1939DcmSwcSRDataElementArrayElement		
Description	Value of an array SR data element compare value.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency			

]

10.1.16 J1939DcmDspExternalSRDataElementClass

[ECUC_J1939Dcm_00062] Definition of EcucChoiceContainerDef J1939DcmDsp ExternalSRDataElementClass [

Choice Container Name	J1939DcmDspExternalSRDataElementClass
Parent Container	J1939DcmConfigSet
Description	This container defines the source of data in a provided port which shall be read respectively the target of data in a required port which shall be written. This container shall contain either one J1939DcmSubElementInDataElementInstance OR J1939DcmDataElementInstance OR J1939DcmSubElementInImplDataElement Instance reference.

No Included Parameters

Container Choices		
Container Name	Multiplicity	Scope / Dependency
J1939DcmDataElementInstance	0..1	Instance Reference to the primitive data in a port where the data element is typed with an ApplicationPrimitiveDataType or an ImplementationDataType.
J1939DcmSubElementInDataElementInstance	0..1	Instance Reference to the primitive sub-element (at any level) of composite data in a port where the data element is typed with an ApplicationCompositeDataType.
J1939DcmSubElementInImplDataElementInstance	0..1	Instance Reference to the primitive sub-element (at any level) of composite data in a port where the data element is typed with an ImplementationDataType.

]

10.1.17 J1939DcmDataElementInstance

[ECUC_J1939Dcm_00064] Definition of EcucParamConfContainerDef J1939DcmDataElementInstance [

Container Name	J1939DcmDataElementInstance
Parent Container	J1939DcmDspExternalSRDataElementClass
Description	Instance Reference to the primitive data in a port where the data element is typed with an ApplicationPrimitiveDataType or an ImplementationDataType.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmDataElementInstanceRef	1	[ECUC_J1939Dcm_00067]

No Included Containers

]

**[ECUC_J1939Dcm_00067] Definition of EcucInstanceReferenceDef J1939Dcm
 DataElementInstanceRef** [

Parameter Name	J1939DcmDataElementInstanceRef		
Parent Container	J1939DcmDataElementInstance		
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		
Multiplicity	1		
Type	Instance reference to AUTOSAR-DATA-PROTOTYPE context: ROOT-SW-COMPOSITION-PROTOTYPE SW-COMPONENT-PROTOTYPE PORT-PROTOTYPE		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency			

]

10.1.18 J1939DcmSubElementInDataElementInstance

**[ECUC_J1939Dcm_00063] Definition of EcucParamConfContainerDef J1939Dcm
 SubElementInDataElementInstance** [

Container Name	J1939DcmSubElementInDataElementInstance		
Parent Container	J1939DcmDspExternalSRDataElementClass		
Description	Instance Reference to the primitive sub-element (at any level) of composite data in a port where the data element is typed with an ApplicationCompositeDataType.		
Configuration Parameters			

Included Parameters			
Parameter Name	Multiplicity	ECUC ID	
J1939DcmSubElementInDataElementInstanceRef	1	[ECUC_J1939Dcm_00066]	

No Included Containers

]

[ECUC_J1939Dcm_00066] Definition of EcucInstanceReferenceDef J1939Dcm SubElementInDataElementInstanceRef [

Parameter Name	J1939DcmSubElementInDataElementInstanceRef		
Parent Container	J1939DcmSubElementInDataElementInstance		
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 SenderReceiver Interfaces and NvDataInterfaces and ParameterDataPrototypes in ParameterInterfaces (read only). This reference is applicable if the AutosarDataPrototype is typed with a ApplicationCompositeDataType.		
Multiplicity	1		
Type	Instance reference to APPLICATION-COMPOSITE-ELEMENT-DATA-PROTOTYPE context: ROOT-SW-COMPOSITION-PROTOTYPE SW-COMPONENT-PROTOTYPE PORT-PROTOTYPE AUTOSAR-DATA-PROTOTYPE APPLICATION-COMPOSITE-ELEMENT-DATA-PROTOTYPE*		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency			

]

10.1.19 J1939DcmSubElementInImplDataElementInstance

[ECUC_J1939Dcm_00065] Definition of EcucParamConfContainerDef J1939Dcm SubElementInImplDataElementInstance [

Container Name	J1939DcmSubElementInImplDataElementInstance		
Parent Container	J1939DcmDspExternalSRDataElementClass		
Description	Instance Reference to the primitive sub-element (at any level) of composite data in a port where the data element is typed with an ImplementationDataType.		
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939DcmSubElementInImplDataElementInstanceRef	1	[ECUC_J1939Dcm_00068]

No Included Containers

]

[ECUC_J1939Dcm_00068] Definition of EcucInstanceReferenceDef J1939DcmSubElementInImplDataElementInstanceRef [

Parameter Name	J1939DcmSubElementInImplDataElementInstanceRef		
Parent Container	J1939DcmSubElementInImplDataElementInstance		
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 SenderReceiver Interfaces and NvDataInterfaces and ParameterDataPrototypes in ParameterInterfaces (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.		
Multiplicity	1		
Type	Instance reference to IMPLEMENTATION-DATA-TYPE-ELEMENT context: ROOT-SW-COMPOSITION-PROTOTYPE SW-COMPONENT-PROTOTYPE PORT-PROTOTYPE AUTOSAR-DATA-PROTOTYPE IMPLEMENTATION-DATA-TYPE-ELEMENT*		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency			

]

A Not Applicable Requirements

[SWS_J1939Dcm_NA_00001] Requirements Not Applicable to this Specification
[These requirements are not applicable to this specification.]

B Change History of AUTOSAR Traceable Items

Please note that the lists in this chapter also include traceable items that have been removed from the specification in a later version. These items do not appear as hyperlinks in the document.

B.1 Traceable Item History of this Document According to AUTOSAR Release R24-11

B.1.1 Added Specification Items in R24-11

none

B.1.2 Changed Specification Items in R24-11

[\[SWS_J1939Dcm_00027\]](#) [\[SWS_J1939Dcm_00091\]](#) [\[SWS_J1939Dcm_00097\]](#)

B.1.3 Deleted Specification Items in R24-11

none

B.1.4 Added Constraints in R24-11

none

B.1.5 Changed Constraints in R24-11

none

B.1.6 Deleted Constraints in R24-11

none