


SCOPE OF APPLICATION All Project/Engineering		SHT/SHTS 1 / 190
Responsibility: Classic AUTOSAR Team	AUTOSAR Dem Manual	DOC. NO: 1.0.0
AUTOSAR Dem User Manual		

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1 Overview

It is written based on AUTOSAR standard SRS / SWS. If more detailed functional explanation is needed when using the module, see the Reference Manual. The interpretation of setting related category is as follows:

- Changeable (C): Items that can be set by the user
- Fixed (F): Items that cannot be changed by the user.
- Not Supported (N): Deprecated item

2 Reference

Sl. No.	Title	Version
1	AUTOSAR_SWS_DiagnosticEventManager.pdf	4.4.0
2	AUTOSAR_SWS_FunctionInhibitionManager.pdf	4.4.0
3	AUTOSAR_SWS_DiagnosticCommunicationManager.pdf	4.4.0
4	AUTOSAR_SWS_DevelopmentErrorTracer.pdf	4.4.0

Acronyms and abbreviations

Acronym:	Description:
N_OK	Not OK
Freeze frame	Freeze frame is defined as a record of data (DIDs/PIDs). Freeze frames are the same as SnapShotRecords in ISO 14229-1.
Extended data record	An extended data record is a record to store specific information assigned to a fault.
Monitor	A diagnostic monitor is a routine entity determining the proper functionality of a component. Alternatively the term “diagnostic function” can be used.
Operating cycle	An ‘Operating cycle’ is the base of the event qualifying and also Dem scheduling (e.g. ignition key off-on cycles, driving cycles, etc.)
Aging	Unlearning/deleting of a no longer failed event/DTC after a defined number of operation cycles from event memory
Healing	Switching of the warning indicator including the handling of reported passed results over a period of time / several operation cycles
PossibleErrors	PossibleErrors means the ApplicationErrors as defined in meta model
Event debouncing	Debouncing is a specific mechanism (e.g. counter-based) to evaluate, if the diagnostic event gets qualified. This works on top of potential signal debouncing and can be done within the SW-C or inside the Dem.
Event qualification	A diagnostic event is qualified in case of a passed or a failed result is set (Dem-internal or reported from another BSW module or SW-C).
Event confirmation	A diagnostic event is confirmed in case of repeated detection of qualified events over cycles or time evaluated by means of fault confirmation counters. Therefore, also the UDS DTC Status bit 3 (ConfirmedDTC) is set.
Event memory overflow indication	The event memory overflow indication indicates, if this specific event memory is full and the next event occurs to be stored in this event memory.

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Readiness	The readiness refers to the tested bits TestNotCompletedSinceLastClear (bit 4) and TestNotCompleteThisOperationCycle (bit 6) of the UDS DTC Status Byte.
Application Layer	The Application Layer is placed above the RTE. Within the Application Layer the AUTOSAR Software-Components are placed.
Channel	A link at which a data transfer can take place. If there is more than one Channel, there is normally some kind of ID assigned to the Channel.
Diagnostic Channel	A link at which a data transfer between a diagnostic tool and an ECU can take place. Example: An ECU is connected via CAN and the diagnostic channel has an assigned CAN-ID. Diagnostic channels connected to other bus-systems such as MOST, FlexRay, LIN, etc. are also possible.
External Diagnostic Tool	A device which is NOT permanently connected to the vehicle communication network. This External Diagnostic Tool can be connected to the vehicle for various purposes, as e.g. for: <ul style="list-style-type: none"> • development, • manufacturing, and • service (in a garage). Example External Diagnostic Tools are: <ul style="list-style-type: none"> • a diagnostic tester, • an OBD scan tool. The External Diagnostic Tool is to be connected by a mechanic to gather information from “inside” the car.
Freeze Frame	A set of the vehicle/system operation conditions at a specific time.
Functional Addressing	The diagnostic communication model where a group or all nodes of a specific communication network receive a message from one sending node (1-n communication). This model is also referred to as ‘broadcast’ or ‘multicast’. OBD communication will always be done in the Functional Addressing mode.
Internal Diagnostic Tool	A device/ECU which is connected to the vehicle communication network. The Internal Diagnostic Tool can be used for: <ul style="list-style-type: none"> advanced event tracking, advanced analysis, for service. The behavior of the Internal Diagnostic Tool can be the same as of an External Diagnostic Tool. The notion of “Internal Diagnostic Tool” does not imply that it is included in each ECU as an AUTOSAR Software-Component.
Physical Addressing	The diagnostic communication model where a node of a specific communication network receives a message from one sending node (1-1 communication). This model is also referred to as ‘unicast’.
UDS Service	this refers to a UDS Service as defined in ISO14229-1
Callouts	Callouts are pieces of code that have to be added to the DCM during ECU integration. The content of most callouts is hand-written code, for some callouts the DCM configuration tool shall generate a default implementation that is manually edited by the integrator. Conceptually, these callouts belong to the ECU Firmware.
DDID	Dynamically Defined Data Identifier

Abbreviation:	Description:
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API	Application Programming Interface
BSW	Basic Software
CRC	Cyclic Redundancy Check
Dcm	Diagnostic Communication Manager
Dem	Diagnostic Event Manager
Det	Development Error Tracer
DID	Data Identifier
Dlt	Diagnostic Log and Trace
DTC	Diagnostic Trouble Code
ECU	Electronic Control Unit
EcuM	Electronic Control Unit Manager
FDC	Fault Detection Counter
FIM	Function Inhibition Manager
HW	Hardware
ID	Identification/Identifier
ISO	International Standardization Organization
IUMPR	In Use Monitoring Performance Ratio
MIL	Malfunction Indication Light
NVRAM	Non volatile RAM
OBD	Onboard Diagnostics
OEM	Original Equipment Manufacturer (Automotive Manufacturer)
OS	Operating System
PID	Parameter Identification
PTO	Power Take Off
RAM	Random Access Memory
ROM	Read-only Memory
RTE	Runtime Environment
SSCP	synchronous server call point
SW	Software
SW-C	Software Component
UDS	Unified Diagnostic Services

3 AUTOSAR System

3.1 Overview of Software Layers

The layered architecture of the AUTOSAR platform is as follows. The AUTOSAR platform can be divided into Service Layer, ECU Abstraction Layer, Complex Device Drivers, and Microcontroller Abstraction Layer.

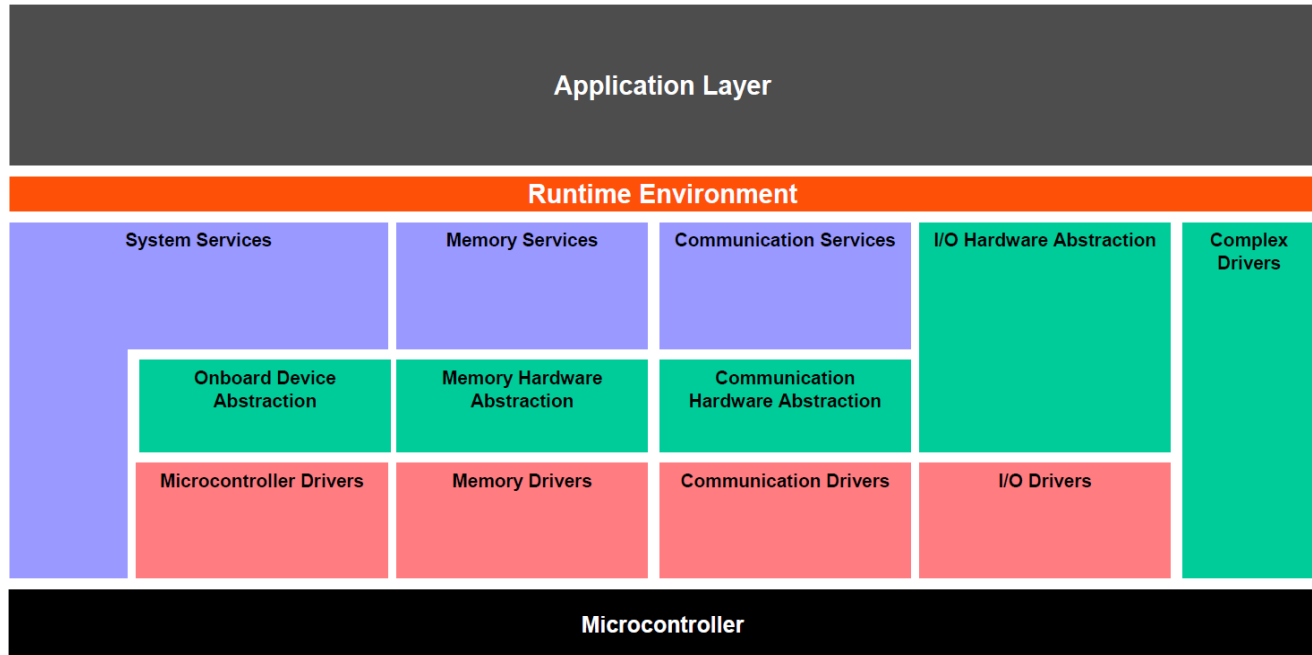
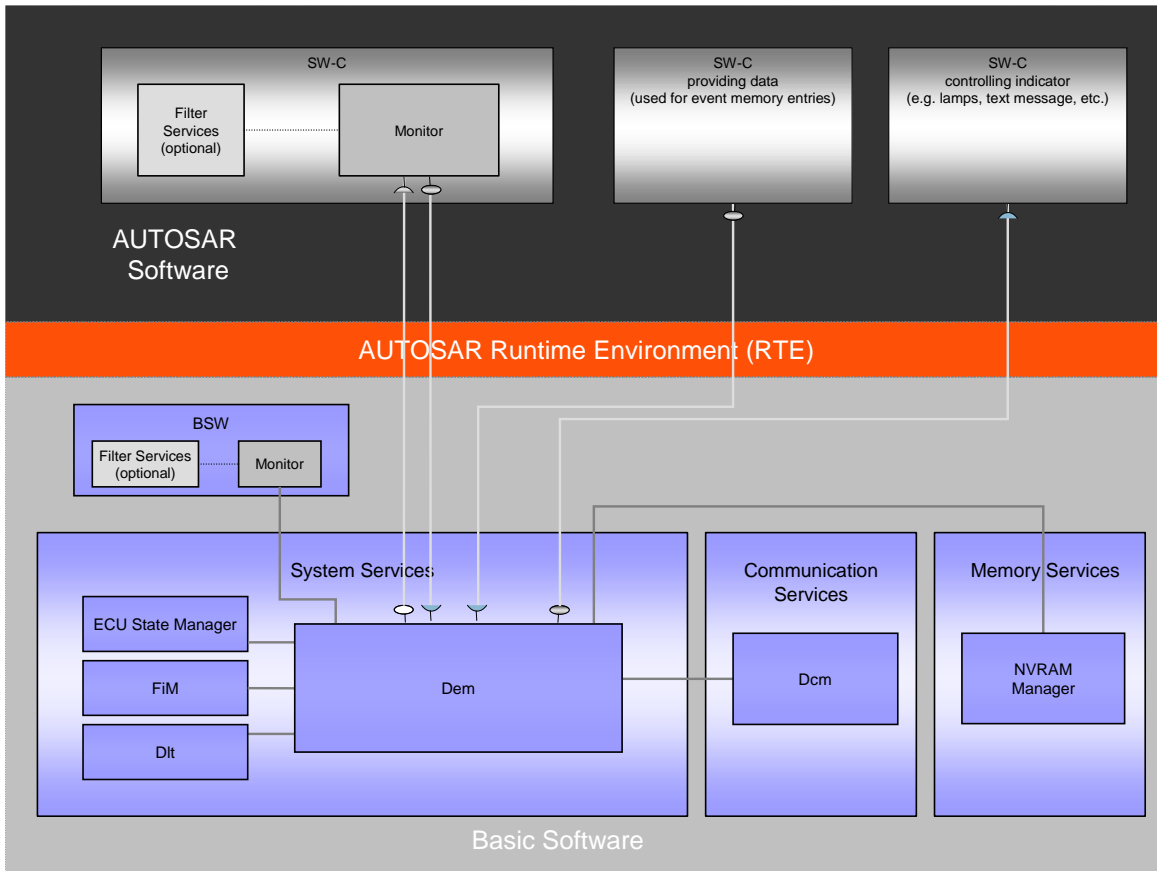


Figure 1

3.2 AUTOSAR Diagnostic Stack



3.2.1 Function Inhibition Manager

The permission status of SW-C functionality is changed according to Event Status (TestFailed, etc.).

In SW-C, it monitors the permission status of functionality to determine whether functionality is operating.

3.2.2 Diagnostic Event Manager

Handles events that occurred in SW-C and BSW modules.

3.2.3 Diagnostic Event Manager

Handles events that occurred in SW-C and BSW modules.

4 Product Release Notes

4.1 Overview

This chapter aims to provide the release information for the Hyundai Autoever **Dem** module. Describes the limitations and specifics about the software product release version.

4.2 Scope of the Release

Module Name	AUTOSAR Version	Module Version
Dem	4.4.0	2.1.0

Module version means Sw version of each module's BswModule Description (Bswmd) file.

4.3 Change Log

4.3.1 Version 1.0.0.0 (2021-02-25)

➤ Feature

■ Initial Version

원인	Initial Version
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.2 Version 1.0.1.0 (2021-05-07)

➤ Feature

■ R44 Migrate changes

원인	Apply R44 fixes
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.3 Version 1.0.2.0 (2021-08-19)

➤ Bug

- Improving Dem generator when container DemGeneralJ1939 is not configuration.

원인	When DemGeneralJ1939 is not configuration, the generated files compile error
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.4 Version 1.0.3.0 (2022-04-01)

➤ Feature

- Applying change of company name

원인	Applying change of company name
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Update generated files, fix compile error in RTU S32G

원인	In previous version, when Dem R44 compile with GHS compiler, error occurs.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Update generator, make sure all macros are generated with expected value

원인	In previous version, DEM_J1939_READINESS1_SUPPORT is generated unexpected value.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Update source code and generator, fix test case fail when executing in RTU S32G

원인	In previous version, when executing test cases in RTU S32G, 1 test case was fail.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Update source code, fix UNUSED unresolved external error

원인	When DemStatusBitHandlingTestFailedSinceLastClear is not set to DEM_STATUS_BIT_AGING_AND_DISPLACEMENT or parameter DemResetConfirmedBitOnOverflow is configured false and parameter DemEventCombinationSupport is not configured DEM_EVCOMB_ONSTORAGE. Unresolved external error occurs in Dem R44.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.5 Version 1.0.4.0 (2022-06-30)**➤ Improvement****■ Fix TCG Validation Error**

원인	Update parameter value to fix TCG validation error
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.6 Version 1.0.5.0 (2022-08-26)**➤ Improvement****■ Fix UNECE**

원인	Fix UNECE
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug**■ Fix generator because of missing DcmDspSubServiceIdClass**

원인	In previous version, when generator error occurs because of missing DcmDspSubServiceIdClassType
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.7 Version 1.0.6.0 (2022-10-25)**➤ Bug**

- Fix NRC 0x14 occurred, when request 0x19 0x06

원인	In previous version, the function to get extended record data was implement mismatch with Autosar Document. So Dcm request service 0x19 (ReadDTCInformation) with subfunction 0x06 return unexpected value.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Fix static code because save error occurred in PrimaryEventManager

원인	In previous version, when user wants to store more than 6 PrimaryEventManager to NvM module, but after reset only 6 PrimaryEventManager were stored
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Correct wrong argument type in API Dem_J1939DcmGetNextFilteredRatio

원인	Type of the first argument type in API Dem_J1939DcmGetNextFilteredRatio is mismatched between Autosar specification and static code of Dem module
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동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Fix generator because of null pointer error

원인	In container DemDTCAttributes, if the parameter DemMemoryDestinationRef configured reference only DemMirrorMemory, unknown error occurs because of getting value of null pointer
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Fix generator because there is no information Dem error after generate

원인	After generate, there is no information Dem error because generator code cannot check invalid reference value of parameter DemExtendedDataClassRef
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.8 Version 1.0.7.0 (2022-11-11)

➤ Bug

- Wrong logic in 19 06 service with ExtendedDataNumber FF

원인	Mismatch for RDTCL service between AUTOSAR R4.3.0 and R4.4.0 When using ExtendedRecordNumber 0xFF, data is reponed 0x00.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.9 Version 1.0.8.0 (2022-12-15)

➤ Bug

- Fix mirror memory is affected to CDTCL service

원인	Mirror Memory cannot be erased by ClearDiagnosticInformation service. Delete wrong logic for mirror memory.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Generated wrong value in DemGroupDTC

원인	Wrong value was set on GroupOfDTC. Fix logic to set correct value.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- NRC 31 must occurred when request CDTCL with 0x000000

원인	If DTC 0x000000 is not set, NRC 31 must be returned but there is positive response. Delete definition of DEM_DTC_GROUP_EMISSION_REL_DTCS (refer to R4.4.0)
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Add logic for filtering mirror memory

원인	When 19 0F(reportMirrorMemoryDTCByStatusMask) is requested, all the DTC is returned. Add logic to filter configured mirror memory.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.10 Version 1.0.9.0 (2023-01-09)

➤ Bug

- When request 19 01, wrong DTCcount is responded

원인	If some DTCs not connected to event parameter, wrong dtc_PointToEventList values are generated.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.11 Version 1.0.10.0 (2023-03-24)

➤ Bug

■ Wrong generated for Dem_ExtendedDataRecordClass

원인	When Dem_ExtendedDataRecordClass is not used, an array with an array size of 0 should not be created. A static code is created whenever Dem_ExtendedDataRecordClass is used or not.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Improvement

■ Check SchM_Exit_Dem_REQUEST_STATUS_PROTECTION pair

원인	SchM_Enter_Dem_REQUEST_STATUS_PROTECTION must be paired with SchM_Exit_Dem_REQUEST_STATUS_PROTECTION.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.12 Version 1.0.11.0 (2023-04-14)

➤ Bug

■ Improve generation logic in comment of Valid NvBlockLength

원인	Valid NvBlockLength relating to Dem_EventStatusNvRamDataType is generated as wrong value. It makes confused about Configured NvBlockLength and leads to compile error.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.13 Version 1.0.12.0 (2023-05-26)**➤ Bug**

- Change to logic related with AgingCycleCounterThreshold

원인	When "Aging Cycle Counter Threshold" is blank ("Aging Allowed" = True), if event's status is changed from failed to passed, DTC should be deleted immediately but DTC was not deleted immediately
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.14 Version 1.0.13.0 (2023-08-01)**➤ Bug**

- Change the to healing operate immediately when an event that is Fail changes to Pass with indicatorHealingCycleCounter 0

원인	When an event in the Fail state is changed to Pass, healing should be done first and then aging, but the agging operation is not processed because healing is not normal
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Change the Dem_SetEventStatus function to consider the return value of Dem_ProcessEventStatus

원인	Dem_SetEventStatus function do not consider the return value of the Dem_ProcessEventStatus function, which is an internal function of the Dem_SetEventStatus function.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.15 Version 1.0.14.0 (2023-08-25)

➤ Bug

- Change generator for DemDebounceFailed(Passed)Threshold's unit

원인	DemDebounceTimeFailed (Passed)Threshold is set in units of sec, but Debounce operation is not normal because conversion to units of ms for use in software is not normal.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Improvement

- Change operation when the configuration NvMSetRamBlockStatusApi is set true

원인	Dem module should support event storage when NvM's configuration NvMSetRamBlockStatusApi is true, but Dem doesn't.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.16 Version 1.0.15.0 (2023-09-15)**➤ Bug**

- Change generation to generated normally about DemClearDtcNotification for user to use. And add 'Header File Inclusion' for user to use DemClearDtcNotification function directly

원인	Port created as P-Port instead of R-Port when DemClearDtcNotification is configured
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.17 Version 1.0.16.0 (2023-12-07)

➤ Bug

- Change generator logic for using DemExternalSRDataElementClass

원인	When using DemExternISRDataelementClass, generator error occurs (no specific error message).
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Change Read DTC (extended data) logic.

원인	When request of service 19 with subfunction 06 and DTCExtendedDataRecordNumber FF is received, NRC 0x14 occurs instead of positive response.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Add Disable/Enable Interrupt verification for UT/IT.

원인	There's no code for Disable/Enable Interrupt verification in UT/IT.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.18 Version 2.0.0.0 (2023-12-31)**➤ Feature****■ J1979-2 specification development**

원인	Request for J1979-2 specification development
동작 영향	없음
설정 영향	/DemGeneral/DemGeneralOBD/DemSupportedObdUdsDtcSeparation (refer 5.13.4) /DemConfigSet/DemObdDTC/DemDTCValue3Byte(refer 5.18)
ASW 조치 사항	없음

➤ Feature**■ J1979 specification development.**

원인	Request for J1979 specification development
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.19 Version 2.0.1.0 (2024-01-31)

➤ Bug

- Change code so that new values can be saved when there is already one value in User Defined Memory

원인	Code error missing operation to save new value in User Defined Memory
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Change code so that new event occurrence is saved in MirrorMemory if event is not found in MirrorMemory

원인	Code error that new event occurrence is saved in MirrorMemory only if event is found in MirrorMemory
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Add GetCycleQualified/SetCycleQualified runnable in Swcdt_Bsw_Dem.template.

원인	Swcdt_Bsw_Dem.template does not have a corresponding runnable
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

4.3.20 Version 2.1.0.0 (2024-03-29)**➤ Feature**

- J1979-3 specification development.

원인	Request for J1979-3 specification development
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Improvement

- Add validation rule for the parameter DemSupportedObdUdsDtcSeparation in Dem and DcmDspReadDTCInformationSupportedObdUdsDtcSeparation in Dcm when 2 configurations are mismatched.

원인	When DemSupportedObdUdsDtcSeparation set true and DcmDspReadDTCInformationSupportedObdUdsDtcSeparation set false, there are some unexpected behavior.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Feature

- Improvement logic for multiple configuration DemFunctionIdRef in container DemRatio

원인	When user configure more than one FiMID in the parameter DemFunctionIdRef. Dem module only support the first configured FiMID.
동작 영향	없음
설정 영향	DemGeneral/DemRatio/DemFunctionIdRef

ASW 조치 사항

없음

➤ Feature

- Add new configset value DEM_IUMPR_NONE into the parameter DemIUMPRGroup

원인	According to OBD, some DTC has no IUMPR group and currently logic does not supported.
동작 영향	없음
설정 영향	Dem/DemGeneral/DemRatio/DemIUMPRGroup
ASW 조치 사항	없음

➤ Feature

- Implement new feature Sender-Receiver

원인	Develop new feature Sender-Receiver for read a data element
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Bug

- Update logic for calculate event confirmation threshold

원인	When a indicator attribute with configured MIL Indicator, the logic to calculate the Indicator On Criteria is wrong.
동작 영향	없음
설정 영향	없음
ASW 조치 사항	없음

➤ Feature

■ Add new configuration parameter DemOperationCycleStatusStorage

원인	Develop new feature for store operation cycle status as non-volatile
동작 영향	없음
설정 영향	Dem/DemGeneral/DemGeneralOBD/DemOperationCycleStatusStorage
ASW 조치 사항	없음

4.4 Module Release Notes

4.4.1 Limitations

- If you want to modify the settings related to SRS, the platform must be redistributed.
If modified arbitrarily, it may operate abnormally.
- Pseudo code
The code provided as an example should be used only for understanding the concept.

4.4.2 Deviations

- DemAgingCycle(DemGeneral) deleted.
Event performs the aging function according to the start/end of the set AgingCycle.
The AgingCycle that can be assigned to the Event was Container DemOperationCycle and Container DemAgingCycle, but the duplicated DemAgingCycle has been deleted, so only DemOperationCycle can be used.
- Delete DemCallbackInitMForF
Callback that is called when the event assigned to DTC is initialized.
Callback InitMonitorForEvent and function were duplicated and deleted.
- Delete DemEventFailureCycleRef
A separate OperationCycle for setting the ConfirmedDTC bit among the Event Status bytes has been deleted. The ConfirmedDTC bit is controlled using the OperationCycle allocated through DemOperationCycleRef.
- Delete DemIndicatorFailureCycleRef
A separate OperationCycle for setting WarningIndicatorRequest bit among Event Status bytes has been deleted. The WarningIndicatorRequest bit is controlled by using the OperationCycle allocated through DemOperationCycleRef.
- Delete DemIndicatorHealingCycleRef

A separate Operation Cycle for clearing the WarningIndicatorRequest bit among Event Status bytes has been deleted. The WarningIndicatorRequest bit is controlled by using the OperationCycle allocated through DemOperationCycleRef.

➤ Delete DemIndicatorFailureCycleSource

The function to select the Operation Cycle to set the WarningIndicatorRequest bit among Event Status bytes has been deleted.

- DEM_FAILURE_CYCLE_EVENT: Use the OperationCycle allocated through DemOperationCycleRef

- DEM_FAILURE_CYCLE_INDICATOR: Use DemIndicatorFailureCycleRef.

➤ DemDataElementClass: Sender Receiver Interface not supported.

Data allocated to FreezeFrame or ExtendedDataRecord is read from Application through RTE.

At this time, only Client-Server Interface is supported.

➤ External Aging not supported

The function to control aging (automatically erase fault codes) by SWC is not supported. Since there is no use case, it will be deleted in the next AUTOSAR version, so there is no support plan.

➤ J1939 protocol

Report order of DM1 and DM2 messages: Among DTCs with high priority, the most recently generated DTC is reported first.

➤ FiM_DemInit

Initialize the initial permission status of FiM through FiM_DemInit function.

➤ Support ClearDTC Operation of Cddl Client-Server Interface.

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(1) If there is no special mark, this parameter is based on AUTOSAR specifications.

In the case of a parameter added by HYUNDAI Autoever, (Autoever specific) is indicated.

(2) If there is a default value that is not supported, the set value should not be changed.

5.1 DemGeneral

Please refer to the following settings.

Parameter Name	Value	Parameter
DemAgingRequiresNotFailedCycle ⁽¹⁾		C
DemAgingRequiresTestedCycle ⁽²⁾		C
DemAvailabilitySupport ⁽³⁾		C
DemBswErrorBufferSize ⁽⁴⁾		C
DemClearDTCBehavior ⁽⁵⁾		C
DemClearDTCLimitation ⁽⁶⁾		C
DemDataElementDefaultEndianness ⁽⁷⁾		C
DemDebounceCounterBasedSupport ⁽⁸⁾		C
DemDebounceTimeBasedSupport ⁽⁹⁾		C
DemDevErrorDetect ⁽¹⁰⁾		C
DemEventCombinationSupport ⁽¹¹⁾		C
DemGeneralInterfaceSupport ⁽¹²⁾		C
DemMaxNumberEventEntryEventBuffer ⁽¹³⁾		C
DemMaxNumberPrestoredFF ⁽¹⁴⁾		C
DemOBDSupport ⁽¹⁵⁾		C
DemPTOSupport ⁽¹⁶⁾		C
DemResetConfirmedBitOnOverflow ⁽¹⁷⁾		C
DemStatusBitHandlingTestFailedSinceLastClear ⁽¹⁸⁾		C
DemStatusBitStorageTestFailed ⁽¹⁹⁾		C
DemSuppressionSupport ⁽²⁰⁾		C
DemTaskTime ⁽²¹⁾		C
DemTriggerFiMReports ⁽²²⁾		C
DemTriggerMonitorInitBeforeClearOk ⁽²³⁾		C
DemVersionInfoApi ⁽²⁴⁾		C

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Parameter Name	Value	Parameter
DemClearEventsWithoutDTCEventMemoryRef ⁽²⁵⁾		C
DemOBDEventMemorySetRef ⁽²⁶⁾		C
DemHeaderFileInclusion ⁽²⁷⁾		C

- (1) DemAgingRequiresNotFailedCycle
Defines if the aging cycle counter is processed in operation cycles with test failed report or not.
True: Aging cycle counter is processed only in operation cycles without test failed.
False (Default): No effect on aging cycle counter processing.
- (2) DemAvailabilitySupport
Defines if the aging cycle counter is processed every aging cycles or if only tested aging cycle are considered.
- (3) DemAvailabilitySupport
This configuration switch defines, whether support for availability is enabled or not.
- (4) DemBswErrorBufferSize
Maximum number of elements in buffer for handling of BSW errors
- (5) DemClearDTCBehavior
Defines the clearing process of diagnostic information for volatile and non-volatile memory and the positive response handling for the Dcm module.
- (6) DemClearDTCLimitation
Defines the supported Dem_<...>ClearDTC API scope.
- (7) DemDataElementDefaultEndianness
Defines the default endianness of the data belonging to a data element which is applicable if the DemExternalSRDataElementClass does not define an endianness.
- (8) DemDebounceCounterBasedSupport
This configuration switch defines, whether support for counter based debouncing is enabled or not.
true: counter based debouncing support is enabled
false: counter based debouncing support is disabled
- (9) DemDebounceTimeBasedSupport
This configuration switch defines, whether support for time based debouncing is enabled or not.
true: time based debouncing support is enabled
false: time based debouncing support is disabled
- (10) DemDevErrorDetect
Switches the development error detection and notification on or off.
true: detection and notification is enabled.
false: detection and notification is disabled.

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(11) DemEventCombinationSupport

This parameter defines the type of event combination supported by the Dem.

(12) DemGeneralInterfaceSupport

The interfaces GeneralEvtInfo, GeneralCallbackEventDataChanged, GeneralCallbackMonitorStatusChanged and GeneralCallbackEventUdsStatusChange are provided if DemGeneralInterfaceSupport is equal to true.

(13) DemMaxNumberEventEntryEventBuffer

Specifies the size of the buffer for storing environmental data (freeze frames and extended data) until they are processed and stored to the event memory.

(14) DemMaxNumberPrestoredFF

Defines the maximum number for prestored freeze frames. If set to 0, then freeze frame prestorage is not supported by the ECU.

(15) DemOBDSupport

This configuration switch defines OBD support and kind of OBD ECU.

(16) DemPTOSupport

This configuration switch defines, whether PTO support (and therefore PID \$1E support) is enabled or not.

(17) DemResetConfirmedBitOnOverflow

This configuration switch defines, whether the confirmed bit is reset or not while an event memory entry will be displaced.

(18) DemStatusBitHandlingTestFailedSinceLastClear

This configuration switch defines, whether the aging and displacement mechanism shall be applied to the "TestFailedSinceLastClear" status bits.

(19) DemStatusBitStorageTestFailed

Activate/Deactivate the permanent storage of the "TestFailed" status bits.

true: storage activated

false: storage deactivated

(20) DemSuppressionSupport

This configuration switch defines, whether support for suppression is enabled or not.

(21) DemTaskTime

Allow to configure the time for the periodic cyclic task. Please note:

This configuration value shall be equal to the value in the Basic Software Scheduler configuration of the RTE module.

The AUTOSAR configuration standard is to use SI units, so this parameter is defined as float value in seconds. Dem configuration tools must convert this float value to the appropriate value format for the use in the software implementation of Dem.

min: A negative value is not allowed.

max: After event status was reported, processing shall be completed within 100ms in order to have the fault entry status information updated as soon as possible (e.g. for PID \$01).
upperMultiplicity: Exactly one TaskTime must be specified per configuration.
lowerMultiplicity: Exactly one TaskTime must be specified per configuration.

(22) DemTriggerFiMReports

Activate/Deactivate the notification to the Function Inhibition Manager.

true: FiM notification activated

false: FiM notification deactivated

(23) DemTriggerMonitorInitBeforeClearOk

Defines if the monitor re-initialization has to be triggered before or after the Dem module returns DEM_CLEAR_OK.

true: trigger re-initialization before DEM_CLEAR_OK

false: trigger re-initialization after DEM_CLEAR_OK

(24) DemVersionInfoApi

Activate/Deactivate the version information API.

true: version information activated

false: version information deactivated

(25) DemClearEventsWithoutDTCEventMemoryRef

Indicating the event memory used as trigger to clear events without assigned DTCs.

(26) DemOBDEventMemorySetRef

References the DemEventMemorySet used for OBD ECU.

(27) DemHeaderFileInclusion

Name of the header file(s) to be included by the Dem module containing the used C-callback declarations.

5.2 DemClient

Parameter Name	Value	Category
DemClientFunctionality ⁽¹⁾		
DemClientId ⁽²⁾		
DemClientUsesRte ⁽³⁾		
DemEventMemorySetRef ⁽⁴⁾		
DemCallbackDTCStatusChanged ⁽⁵⁾		

(1) DemClientFunctionality:

Functionality provided by Dem for the DemClient.

(2) DemClientId:

Defines a unique identifier for a Dem client. This number is used by this client in the ClientID parameter in all API with this parameter.

(3) DemClientUsesRte:

If set to true, this client shall only use the DEM via RTE (Dem will provide the C/S interfaces: CddIf, EvMemOverflowIndication). The client must not do any C_API calls to the DEM.

(4) DemEventMemorySetRef:

References to the client assigned event memory container that contains client specific settings and event memories.

(5) DemCallbackDTCStatusChanged:

The presence of this container indicates, that the Dem has access to a "DTCStatusChanged" callback, which the Dem will call to notify other components about the change in the status of a DTC. In case there is a DemCallbackDTCStatusChangedFnc, this parameter defines the name of the function that the Dem will call. In case there is no DemCallbackDTCStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackDTCStatusChanged whose name is generated by using the unique callback-prefix followed by the event name.

Status change notifications are supported for DTCs in primary memory only.

5.3 DemDataElementClass

Parameter Name	Value	Category
DemExternalCSDataElementClass ⁽¹⁾		C
DemExternalSRDataElementClass ⁽²⁾		C
DemInternalDataElementClass ⁽³⁾		C

(1) DemExternalCSDataElementClass :

This container contains the configuration (parameters) for an external client/server based data element class. It defines, how the Dem can obtain the value of the data element from either a SW-C or another BSW module. Whether a client/server port or a C function-call is used, is defined by DemDataElementUsePort.

(2) DemExternalSRDataElementClass:

This container contains the configuration (parameters) for an external sender/receiver based data element class. It defines, how the Dem can obtain the value of the data element from a SW-C, by using a sender/receiver port.

(3) DemInternalDataElementClass:

This container contains the configuration (parameters) for an internal data element class.

5.3.1 DemExternalCSDataElementClass

Parameter Name	Value	Category
DemDataElementArraySize ⁽¹⁾		C
DemDataElementDataType ⁽²⁾		C
DemDataElementProvideMonitorData ⁽³⁾		C
DemDataElementReadFnc ⁽⁴⁾		
DemDataElementUsePort ⁽⁵⁾		

(1) DemDataElementArraySize:

If the data element is an array data element, it defines the number of elements in the array. Note that this is not the size in bytes.

(2) DemDataElementDataType:

Provide the implementation data type of this C/S data element.

(3) DemDataElementProvideMonitorData:

If the parameter is set to True, the generated function call to retrieve the data element has the monitorData0 as additional first parameter.

(4) DemDataElementReadFnc:

If the parameter is set to True, the generated function call to retrieve the data element has the monitorData0 as additional first parameter.

(5) DemDataElementUsePort:

If the parameter is set to True, a R-Port is generated, to obtain the data element (interface DataServices_{Data}). If the parameter is set to False, the information is obtained by C function-call on another BSW module specified by the parameter DemDataElementReadFnc.

5.3.2 DemExternalCSDataElementClass

Parameter Name	Value	Category
DemDataElementArraySize ⁽¹⁾		C
DemDataElementDataType ⁽²⁾		C
DemDataElementEndianness ⁽³⁾		C

(1) DemDataElementArraySize:

If the data element is an array data element, it defines the number of elements in the array. Note that this is not the size in bytes.

(2) DemDataElementDataType:

Provide the implementation data type of data belonging to an external data.

(3) DemDataElementEndianness:

Defines the endianness of the data belonging to an external data.

If no DemDataElementEndianness is defined the value of DemDataElementDefaultEndianness is applicable.

5.3.2.1 DemDiagnosisScaling

Parameter Name	Value	Category
DemAlternativeDataInterface ⁽¹⁾		C
DemAlternativeDataType ⁽²⁾		C
DemAlternativeDiagnosticDataElement ⁽³⁾		C

(1) DemAlternativeDataInterface:

This container contains the configuration (parameters) of an alternative Diagnosis Representation by the means of a VariableDataPrototype in a DataInterface. Additionally a reference to PortInterfaceMapping can be defined which provide already the mapping rules between the VariableDataPrototype in a DataInterface used by the software component (DemSRDataElementClass) and the intended Diagnosis Representation defined by DemExternalSRDataElementClass.

(2) DemAlternativeDataType:

This container contains the configuration (parameters) of an alternative Diagnosis Representation by the means of an ApplicationDataType. Additionally the definition of a text table mapping can be defined for ApplicationDataTypes that refers to a CompuMethod of category TEXTTABLE and SCALE_LINEAR_AND_TEXTTABLE.

(3) DemAlternativeDiagnosticDataElement:

This container contains the configuration (parameters) of an alternative Diagnosis Representation by the means of Diagnostic Extract. If no DemDataElementEndianness is defined the value of DemDataElementDefaultEndianness is applicable.

5.3.2.1.1 DemDiagnosisScaling

Parameter Name	Value	Category
DemDataElement ⁽¹⁾		C
DemPortInterfaceMapping ⁽²⁾		C

(1) DemAlternativeDataInterface:

Alternative Diagnosis Representation for the data defined by the means of a VariableDataPrototype in a DataInterface.

The CompuMethod of the data type of the referenced VariableDataPrototype will be applied to the data type of the VariableDataPrototype in the interface used by the Dem.

(2) DemAlternativeDataType:

Optional reference to PortInterfaceMapping which defines the mapping rules.

The PortInterfaceMapping is used to get the DataPrototypeMapping that describes a conversion between the data prototype referenced by DemDataElement and the data prototype referenced from DcmDspExternalSRDataElementClass.

5.3.2.1.2 DemAlternativeDataType

Parameter Name	Value	Category
DemApplicationDataType ⁽¹⁾		C
DemTextTableMapping ⁽²⁾		C

(1) DemApplicationDataType:

Alternative Diagnosis Representation for the data defined by the means of a ApplicationDataType of category VALUE, BOOLEAN or ARRAY.

The CompuMethod that applies to the referenced ApplicationDataType in case of category VALUE or BOOLEAN will be applied to the data type of the VariableDataPrototype in the interface used by the Dem.

(2) DemTextTableMapping:

Optional reference to PortInterfaceMapping which defines the mapping rules.

The PortInterfaceMapping is used to get the DataPrototypeMapping that describes a conversion between the data prototype referenced by DemDataElement and the data prototype referenced from DcmDspExternalSRDataElementClass.

5.3.2.1.3 DemAlternativeDiagnosticDataElement

Parameter Name	Value	Category
DemDiagnosticDataElementRef ⁽¹⁾		C

(1) DemApplicationDataType:

Alternative Diagnosis Representation for the data defined by the means of a DiagnosticDataElement in the Diagnostic Extract. This EcucForeignReference enables the access to all SwDataDefProps, in particular BaseType, CompuMethod and DataConstr

5.3.2.2 DemSRDataElementClass

Parameter Name	Value	Category
DemDataElementInstance ⁽¹⁾		C
DemSubElementInDataElementInstance ⁽²⁾		C
DemSubElementInImplDataElementInstance ⁽³⁾		C

(1) DemAlternativeDataInterface:

Instance Reference to the primitive data in a port where the data element is typed with an ApplicationPrimitiveDataType or an ImplementationDataType

(2) DemAlternativeDataType:

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.

(3) DemAlternativeDiagnosticDataElement:

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 of category STRUCTURE or ARRAY.

5.3.2.2.1 DemDataElementInstance

Parameter Name	Value	Category
DemDataElementInstanceRef ⁽¹⁾		C

(1) DemAlternativeDataInterface:

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.

5.3.2.2.2 DemSubElementInDataElementInstance

Parameter Name	Value	Category
DemSubElementInDataElementInstanceRef ⁽¹⁾		C

(1) DemSubElementInDataElementInstanceRef:

Instance Reference to the primitive sub-element (at any level) of composite data in a port 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 ApplicationCompositeDataType.

5.3.2.3.3 DemSubElementInImplDataElementInstance

Parameter Name	Value	Category
DemSubElementInImplDataElementInstanceRef ⁽¹⁾		C

(1) DemApplicationDataType:

Instance Reference to the primitive sub-element (at any level) of composite data in a port 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 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.

5.3.3 DemInternalDataElementClass

Parameter Name	Value	Category
DemDataElementDataSize ⁽¹⁾		C
DemInternalDataElement ⁽²⁾		C

(1) DemAlternativeDataInterface:

Defines the size of the data element in bytes.

(2) DemInternalDataElement:

This parameter defines the Dem-internal data value, which is mapped to the data element.

5.4 DemDidClass

Parameter Name	Value	Category
DemDidIdentifier ⁽¹⁾		C
DemDidDataElementClassRef ⁽²⁾		C

(1) DemDidIdentifier:

Identifier of the Data ID.

(2) DemDidDataElementClassRef:

This reference contains the link to a data element class.

Attributes: requiresIndex=true

5.5 DemEnableCondition

Parameter Name	Value	Category
DemEnableConditionId ⁽¹⁾		C
DemEnableConditionStatus ⁽²⁾		C

(1) DemEnableConditionId:

Defines a unique enable condition Id.

This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The enable conditions should be sequentially ordered beginning with 0 and no gaps in between.

(2) DemEnableConditionStatus:

Defines the initial status for enable or disable of acceptance of event reports of a diagnostic event.

The value is the initialization after power up (before this condition is reported the first time).

true: acceptance of a diagnostic event enabled

false: acceptance of a diagnostic event disabled.

5.6 DemEnableConditionGroup

Parameter Name	Value	Category
DemEnableConditionRef ⁽¹⁾		C

- (1) DemEnableConditionRef:
References an enable condition.

5.7 DemEventMemorySet

Parameter Name	Value	Category
DemDtcStatusAvailabilityMask ⁽¹⁾		C
DemMaxNumberEventEntryPermanent ⁽²⁾		C
DemTypeOfDTCSupported ⁽³⁾		C
DemAmberWarningLampIndicatorRef ⁽⁴⁾		C
DemMILIndicatorRef ⁽⁵⁾		C
DemProtectLampIndicatorRef ⁽⁶⁾		C
DemRedStopLampIndicatorRef ⁽⁷⁾		C

- (1) DemDtcStatusAvailabilityMask:
Mask for the supported DTC status bits by the Dem. This mask is used by UDS service 0x19.
- (2) DemMaxNumberEventEntryPermanent:
Maximum number of events which can be stored in the permanent memory.
The assignment of an event to this memory type is dynamic and used for emission-related events only.
- (3) DemTypeOfDTCSupported:
This parameter defines the format returned by Dem_GetTranslationType and does not relate to/influence the supported Dem functionality.
- (4) DemAmberWarningLampIndicatorRef:
This parameter defines the indicator representing the AmberWarningLamp . This parameter may be used for ECUs supporting J1939.
- (5) DemMILIndicatorRef:
This parameter defines the indicator representing the MIL.
This parameter is mandatory for ECUs supporting OBD (refer to DemOBDSupport).
- (6) DemProtectLampIndicatorRef:
This parameter defines the indicator representing the ProtectLamp.
This parameter may be used for ECUs supporting J1939.
- (7) DemRedStopLampIndicatorRef:
This parameter defines the indicator representing the RedStopLamp.
This parameter may be used for ECUs supporting J1939.

5.7.1 DemClearDTCNotification

Parameter Name	Value	Category
DemClearDtcNotificationFnc ⁽¹⁾		C
DemClearDtcNotificationTime ⁽²⁾		C

- (1) DemClearDtcNotificationFnc:
Notification callback function name which is called on a clear DTC operation (refer to <Module>_ClearDtcNotification).
- (2) DemClearDtcNotificationTime:
Configure, whether the callback shall be called on start of a clear or after finishing a clear DTC operation (refer to <Module>_ClearDtcNotification)

5.7.2 DemIndicator

Parameter Name	Value	Category
DemIndicatorID ⁽¹⁾		C

- (1) DemIndicatorID:
Unique identifier of an indicator.

5.7.3 DemMirrorMemory

Parameter Name	Value	Category
DemMaxNumberEventEntryMirror ⁽¹⁾		C

- (1) DemMaxNumberEventEntryMirror:
Maximum number of events which can be stored in the mirror memory

5.7.4 DemPrimaryMemory

Parameter Name	Value	Category
DemEnvironmentDataCapture ⁽¹⁾		C
DemEventDisplacementStrategy ⁽²⁾		C
DemEventMemoryEntryStorageTrigger ⁽³⁾		C
DemMaxNumberEventEntryPrimary ⁽⁴⁾		C
DemOccurrenceCounterProcessing ⁽⁵⁾		C
DemTypeOfFreezeFrameRecordNumeration ⁽⁶⁾		C
DemGroupOfDTC ⁽⁷⁾		C

- (1) DemEnvironmentDataCapture:
DemEnvironmentDataCapture defines the point in time, when the data actually is captured.
- (2) DemEventDisplacementStrategy:
This configuration switch defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.
- (3) DemEventMemoryEntryStorageTrigger:
Configures the primary trigger to allocate an event memory entry.
- (4) DemMaxNumberEventEntryUserDefined:
Maximum number of events which can be stored in the primary memory.

(5) DemOccurrenceCounterProcessing:

This configuration switch defines the consideration of the fault confirmation process for the occurrence counter. For OBD and mixed systems (OBD/non OBD, refer to DemOBDSupport) configuration switch shall always set to DEM_PROCESS_OCCCTR_TF.

(6) DemTypeOfFreezeFrameRecordNumeration:

This parameter defines the type of assigning freeze frame record numbers for event-specific freeze frame records.

(7) DemGroupOfDTC:

This container contains the configuration (parameters) for DTC groups.

5.7.5 DemUserDefinedMemory

Parameter Name	Value	Category
DemEnvironmentDataCapture ⁽¹⁾		C
DemEventDisplacementStrategy ⁽²⁾		C
DemEventMemoryEntryStorageTrigger ⁽³⁾		C
DemMaxNumberEventEntryPrimary ⁽⁴⁾		C
DemOccurrenceCounterProcessing ⁽⁵⁾		C
DemTypeOfFreezeFrameRecordNumeration ⁽⁶⁾		C
DemUserDefinedMemoryIdentifier ⁽⁷⁾		C
DemGroupOfDTC ⁽⁸⁾		C

(1) DemEnvironmentDataCapture:

DemEnvironmentDataCapture defines the point in time, when the data actually is captured.

(2) DemEventDisplacementStrategy:

This configuration switch defines, whether support for event displacement is enabled or not, and which displacement strategy is followed.

(3) DemEventMemoryEntryStorageTrigger:

Configures the primary trigger to allocate an event memory entry.

(4) DemMaxNumberEventEntryUserDefined:

Maximum number of events which can be stored in the primary memory.

(5) DemOccurrenceCounterProcessing:

This configuration switch defines the consideration of the fault confirmation process for the occurrence counter. For OBD and mixed systems (OBD/non OBD, refer to DemOBDSupport) configuration switch shall always set to DEM_PROCESS_OCCCTR_TF.

(6) DemTypeOfFreezeFrameRecordNumeration:

This parameter defines the type of assigning freeze frame record numbers for event-specific freeze frame records.

(7) DemUserDefinedMemoryIdentifier:

This parameter defines the type of assigning freeze frame record numbers for event-specific freeze frame records.

(8) DemGroupOfDTC:

This container contains the configuration (parameters) for DTC groups.

5.8 DemExtendedDataClass

Parameter Name	Value	Category
DemExtendedDataRecordClassRef ⁽¹⁾		C

(1) DemExtendedDataRecordClassRef:

This reference contains the link to an extended data class record.

Attributes:

requiresIndex=true.

5.9 DemExtendedDataRecordClass

Parameter Name	Value	Category
DemExtendedDataRecordNumber ⁽¹⁾		C
DemExtendedDataRecordTrigger ⁽²⁾		C
DemExtendedDataRecordUpdate ⁽³⁾		C
DemDataElementClassRef ⁽⁴⁾		C

(1) DemExtendedDataRecordNumber:

This configuration parameter specifies a unique identifier for an extended data record.

One or more extended data records can be assigned to one diagnostic event/DTC.

0x00 is reserved by ISO (therefore the minimal value equals 1)

0xF0 to 0xFF are reserved by ISO (therefore the maximal value equals 239).

(2) DemExtendedDataRecordTrigger:

Defines the trigger to store the ExtendedDataRecord.

(3) DemExtendedDataRecordUpdate:

This extended data record is captured if the configured trigger condition in "DemExtendedDataRecordTrigger" is fulfilled.

(4) DemDataElementClassRef:

This reference contains the link to a data element class.

Attributes:

requiresIndex=true.

5.10 DemFreezeFrameClass

Parameter Name	Value	Category
DemDidClassRef ⁽¹⁾		C

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(1) DemDidClassRef:

Reference to the DID elements which shall be contained in the freeze frame.

Attributes:

requiresIndex=true.

5.11 DemFreezeFrameRecNumClass

Parameter Name	Value	Category
DemFreezeFrameRecordClassRef ⁽¹⁾		C

(1) DemFreezeFrameRecordClassRef:

This parameter references record number(s) for a freeze frame record.

Attributes:

requiresIndex=true.

5.12 DemFreezeFrameRecordClass

Parameter Name	Value	Category
DemFreezeFrameRecordNumber ⁽¹⁾		C
DemFreezeFrameRecordTrigger ⁽²⁾		C
DemFreezeFrameRecordUpdate ⁽³⁾		C

(1) DemFreezeFrameRecordNumber:

This parameter defines a record number for a freeze frame record.

This record number is unique per freeze frame record number class..

(2) DemFreezeFrameRecordTrigger:

Defines the trigger to store the FreezeFrameRecord.

Tags:

atp.Status=draft.

(3) DemFreezeFrameRecordUpdate:

This parameter defines the case, when the freeze frame record is stored/updated.

5.13 DemGeneralJ1939

Parameter Name	Value	Parameter
DemJ1939ClearDtcSupport ⁽¹⁾		C
DemJ1939Dm31Support ⁽²⁾		C
DemJ1939ExpandedFreezeFrameSupport ⁽³⁾		C
DemJ1939FreezeFrameSupport ⁽⁴⁾		C
DemJ1939RatioSupport ⁽⁵⁾		C
DemJ1939Readiness1Support ⁽⁶⁾		C

Parameter Name	Value	Parameter
DemJ1939Readiness2Support ⁽⁷⁾		C
DemJ1939Readiness3Support ⁽⁸⁾		C
DemJ1939ReadingDtcSupport ⁽⁹⁾		C
DemCallbackJ1939DTCStatusChanged ⁽¹⁰⁾		C
DemJ1939FreezeFrameClass ⁽¹¹⁾		
DemSPNClass ⁽¹²⁾		

(1) DemJ1939ClearDtcSupport:

This configuration switch defines whether clearing J1939 DTCs (DM03 und DM11) is supported or not.

This switches on and off the API Dem_J1939DcmClearDTC.

DemJ1939Dm31Support This configuration switch defines whether clearing J1939 DTCs (DM03 und DM11) is supported or not.

This switches on and off the API Dem_J1939DcmClearDTC.

(2) DemJ1939ClearDtcSupport:

This configuration switch defines whether J1939 DM31 is supported or not.

This switches on and off the APIs

Dem_J1939DcmFirstDTCwithLampStatus and

Dem_J1939DcmGetNextDTCwithLampStatus.

(3) DemJ1939ExpandedFreezeFrameSupport:

This configuration switch defines whether J1939 expanded freeze frames are supported or not.

This switches on and off the APIs

Dem_J1939DcmSetFreezeFrameFilter,

Dem_J1939DcmGetNextFreezeFrame and

Dem_J1939DcmGetNextSPNInFreezeFrame.

(4) DemJ1939FreezeFrameSupport:

This configuration switch defines whether J1939 freeze frames are supported or not.

This switches on and off the APIs Dem_J1939DcmSetFreezeFrameFilter and

Dem_J1939DcmGetNextFreezeFrame.

(5) DemJ1939RatioSupport:

This configuration switch defines whether J1939 performance ratios are supported or not.

This switches on and off the APIs Dem_J1939DcmSetRatioFilter and Dem_J1939DcmGetNextFilteredRatio.

(6) DemJ1939Readiness1Support

This configuration switch defines whether J1939 diagnostic readiness 1 is supported or not.

This switches on and off the API Dem_J1939DcmReadDiagnosticReadiness1.

(7) DemJ1939Readiness2Support

This configuration switch defines whether J1939 diagnostic readiness 2 is supported or not.

This switches on and off the API Dem_J1939DcmReadDiagnosticReadiness2.

(8) DemJ1939Readiness3Support

This configuration switch defines whether J1939 diagnostic readiness 3 is supported or not.

This switches on and off the API Dem_J1939DcmReadDiagnosticReadiness3..

(9) DemJ1939ReadingDtcSupport

This configuration switch defines whether J1939 DTC readout is supported or not.

This switches on and off the APIs Dem_J1939DcmSetDTCFilter, Dem_J1939DcmGetNumberOfFilteredDTC and Dem_J1939DcmGetNextFilteredDTC.

(10) DemCallbackJ1939DTCStatusChanged

The presence of this container indicates, that the Dem has access to a "DTCStatusChanged" callback, which the Dem will call to notify other components about the change in the status of a DTC.

In case there is a DemCallbackDTCStatusChangedFnc, this parameter defines the name of the function that the Dem will call.

In case there is no DemCallbackDTCStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackDTCStatusChanged whose name is generated by using the unique callback-prefix followed by the event name.

Status change notifications are supported for DTCs in primary memory only.

(11) DemCallbackJ1939DTCStatusChanged

This container contains the combinations of SPNs s for a J1939 relevant freeze frame.

(12) DemSPNClass

This container contains the configuration (parameters) for a SPN.

5.13.1 DemCallbackJ1939DTCStatusChanged

Parameter Name	Value	Category
DemCallbackDTCStatusChangedFnc ⁽¹⁾		C

- (1) DemCallbackDTCStatusChangedFnc:
Function name of prototype "DTCStatusChanged".

5.13.2 DemJ1939FreezeFrameClass

Parameter Name	Value	Category
DemSPNClassRef ⁽¹⁾		C

1. DemSPNClassRef:
Reference to an SPN. This reference defines requiresIndex = true since it represents a ordered list of references where the order describes the order of single SPNs in the J1939 Freeze Frame.
Attributes:

5.13.3 DemSPNClass

Parameter Name	Value	Category
DemSPNId ⁽¹⁾		C
DemSPNDataElementClassRef ⁽²⁾		

- (1) DemSPNId:
Suspect parameter number
(2) DemSPNDataElementClassRef:

5.13.4 DemGeneralOBD

Parameter Name	Value	Parameter
DemOBDCentralizedPID21Handling ⁽¹⁾		C
DemOBDCentralizedPID31Handling ⁽²⁾		C
DemOBDCompliance ⁽³⁾		C
DemOBDCompliance ⁽⁴⁾		C
DemOBDEngineType ⁽⁵⁾		C
DemOBDEventDisplacement ⁽⁶⁾		C
DemOBDDrivingCycleRef ⁽⁷⁾		C
DemOBDDInputAcceleratorPedalInformation ⁽⁸⁾		C
DemOBDDInputAmbientPressure ⁽⁹⁾		C
DemOBDDInputAmbientTemperature ⁽¹⁰⁾		C
DemOBDDInputDistanceInformation ⁽¹¹⁾		C
DemOBDDInputEngineSpeed ⁽¹²⁾		C
DemOBDDInputEngineTemperature ⁽¹³⁾		C
DemOBDDInputProgrammingEvent ⁽¹⁴⁾		C
DemOBDDInputVehicleSpeed ⁽¹⁵⁾		C
DemOBDDPFCCycleRef ⁽¹⁶⁾		C
DemOBDDTimeSinceEngineStart ⁽¹⁷⁾		C
DemOBDDWarmUpCycleRef ⁽¹⁸⁾		C
DemCallbackOBDDTCStatusChanged ⁽¹⁹⁾		C
DemSupportedObdUdsDtcSeparation ⁽²⁰⁾		C
DemOperationCycleStatusStorage ⁽²¹⁾		C

- (1) DemOBDCentralizedPID21Handling:
Switch to enable the centralized handling of PID \$21.
true: centralized handling of PID \$21 enabled
false: centralized handling of PID \$21 disabled
- (2) DemOBDCentralizedPID31Handling:
Switch to enable the centralized handling of PID \$31.
true: centralized handling of PID \$31 enabled
false: centralized handling of PID \$31 disabled
- (3) DemOBDCompliance:
Configuration value to define the appropriate value to PID\$1C "OBD requirements to which vehicle or engine is certified." according to the respective standards, e.g. OBD, OBDII, JOBD etc. Notice as well J1979 or the "DiagnosticReadiness 1" DM05 message of J1939-73

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- (4) DemOBDDelayedDCYConfirmedAndMIL:
Controls the delayed calculation of the confirmed status for the OBD driving cycle.
- (5) DemOBDEngineType:
Switch to provide either Gasoline or Diesel parameters.
- (6) DemOBDEventDisplacement:
Activate/Deactivate a different displacement behavior for OBD events.
OBD events with special Conditions (e.g. Pending, MIL_On...) shall not be displaced.
- (7) DemOBDDrivingCycleRef:
Defines the operationCycle which denotes the OBD driving cycle.
- (8) DemOBDDInputAcceleratorPedalInformation:
Input variable for the accelerator pedal information, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (9) DemOBDDInputAmbientPressure:
Input variable for the ambient pressure, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (10) DemOBDDInputAmbientTemperature:
Input variable for the ambient temperature, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (11) DemOBDDInputDistanceInformation:
Input variable for the distance information, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (12) DemOBDDInputEngineSpeed:
Input variable for the engine speed, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (13) DemOBDDInputEngineTemperature:
Input variable for the engine temperature, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (14) DemOBDDInputProgrammingEvent:
Input variable for the programming event, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (15) DemOBDDInputVehicleSpeed:
Input variable for the vehicle speed, which is assigned to a specific data element used as interface for the Dem-internal PID calculations.
- (16) DemOBDDPFCCycleRef:

Defines the operationCycle, which is relevant for processing the OBDPFCCycle.

(17) DemOBDDTimeSinceEngineStart:

Input variable for the Time Since Engine Start information, which is assigned to a specific data element

(18) DemOBDDWarmUpCycleRef:

Defines the operationCycle which denotes the OBD warm-up cycle.

(19) DemCallbackOBDDTCStatusChanged:

The presence of this container indicates, that the Dem has access to a "DTCStatusChanged" callback, which the Dem will call to notify other components about the change in the status of a DTC.

In case there is a DemCallbackDTCStatusChangedFnc, this parameter defines the name of the function that the Dem will call.

In case there is no DemCallbackDTCStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackDTCStatusChanged whose name is generated by using the unique callback-prefix followed by the event name.

Status change notifications are supported for DTCs in primary memory only.

(20) DemSupportedObdUdsDtcSeparation:

The configuration will report a different 3 byte DTC number for SAE J1979-2 based UDS communication than for none J1979-2 UDS communication

(21) DemOperationCycleStatusStorage:

Defines if the operation cycle state is available over the power cycle (stored non-volatile) or not.

The DemOperationCycleStatusStorage shall only be present if DemOBDSupport is set to

DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

true: the operation cycle state is stored non-volatile

false: the operation cycle state is only stored volatile

5.14 DemCallbackOBDDTCStatusChanged

Parameter Name	Value	Category
DemCallbackDTCStatusChangedFnc ⁽¹⁾		C

(1) DemCallbackDTCStatusChangedFnc:

Function name of prototype "DTCStatusChanged".

5.15 DemNvRamBlockId

Parameter Name	Value	Category
DemNvRamBlockIdRef ⁽¹⁾		C

(1) DemNvRamBlockIdRef:

This reference contains the link to a non-volatile memory block. For post build time configurations worst case scenario shall be used.

5.16 DemOperationCycle

Parameter Name	Value	Category
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DemOperationCycleAutostart ⁽¹⁾		C
DemOperationCycleId ⁽²⁾		C
DemLeadingCycleRef ⁽³⁾		C

- (1) DemOperationCycleAutostart:
The autostart property defines if the operation cycles is automatically (re-)started during Dem_PreInit.
- (2) DemOperationCycleId:
This parameter's value is used, together with the aggregating container, to define a symbolic name of the operation cycle.
- (3) DemLeadingCycleRef:
Defines the operation cycle, which is relevant for processing this operation cycle.

5.17 DemRatio

Parameter Name	Value	Parameter
DemIUMPRDenGroup ⁽¹⁾		C
DemIUMPRGroup ⁽²⁾		C
DemRatioId ⁽³⁾		C
DemRatioKind ⁽⁴⁾		C
DemDiagnosticEventRef ⁽⁵⁾		C
DemFunctionIdRef ⁽⁶⁾		C

- (1) DemIUMPRDenGroup:
This parameter specifies the assigned denominator type which is applied in addition to the DEM_IUMPR_GENERAL_INDIVIDUAL_DENOMINATOR conditions.
- (2) DemIUMPRGroup:
This parameter specifies the assigned IUMPR group of the ratio Id.
- (3) DemRatioId:
Defines a unique ratio Id.
This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The ratio Ids should be sequentially ordered beginning with 0 and no gaps in between.
- (4) DemRatioKind:
This parameter defines whether the ratio will be calculated API or observer based.
- (5) DemDiagnosticEventRef:
This reference contains the link to a diagnostic event.
- (6) DemFunctionIdRef:
This reference contains the link to a function identifier within the FiM which is used as a primary FID.

5.18 DemStorageCondition

Parameter Name	Value	Category
DemStorageConditionId ⁽¹⁾		C
DemStorageConditionStatus ⁽²⁾		C
DemLeadingCycleRef ⁽³⁾		C

- (1) DemStorageConditionId:
Defines a unique storage condition Id. This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The storage conditions should be sequentially ordered beginning with 0 and no gaps in between.
- (2) DemStorageConditionStatus:
Defines the initial status for enable or disable of storage of a diagnostic event.
The value is the initialization after power up (before this condition is reported the first time).
true: storage of a diagnostic event enabled
false: storage of a diagnostic event disabled
- (3) DemStorageConditionReplacementEventRef:
Specifies the reference to an event which is stored to event memory and supports failure analysis.

5.19 DemStorageConditionGroup

Parameter Name	Value	Category
DemStorageConditionRef ⁽¹⁾		C

- (1) DemStorageConditionId:
References an enable condition.

5.20 DemStorageConditionGroup

Parameter Name	Value	Category
DemStorageConditionRef ⁽¹⁾		C

- (1) DemStorageConditionId:
References an enable condition.

5.21 DemComponent

Parameter Name	Value	Parameter
DemComponentFailedCallbackFnc ⁽¹⁾		C
DemComponentFailedCallbackUsePort ⁽²⁾		C
DemComponentId ⁽³⁾		C
DemComponentIgnoresPriority ⁽⁴⁾		C
DemImmediateChildComponentRef ⁽⁵⁾		C

- (1) DemComponentFailedCallbackFnc:
Specifies the function to be called on component failed status changes.
- (2) DemComponentFailedCallbackUsePort:
Specifies whether CBStatusComp_{ComponentName} for component change notifications shall be provided.
- (3) DemComponentId:
Unique identifier of a DemComponent.

Component Id should be configured in sequential order beginning with 1 and no gaps in between. This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id.

(4) DemComponentIgnoresPriority:

This configuration switch defines, whether the priority of events at this component shall be ignored.

(5) DemImmediateChildComponentRef:

Reference to all immediate children of the current component.

5.22 DemDTC

Parameter Name	Value	Parameter
DemDTCFunctionalUnit ⁽¹⁾		C
DemDTCSeverity ⁽²⁾		C
DemDtcValue ⁽³⁾		C
DemNvStorageStrategy ⁽⁴⁾		C
DemWVHOBDDTCClass ⁽⁵⁾		C
DemDTCAttributesRef ⁽⁶⁾		C
DemObdDTCRef ⁽⁶⁾		C

(1) DemIUMPRDenGroup:

DTCFuncionalUnit is a 1-byte value which identifies the corresponding basic vehicle / system function which reports the DTC. This parameter is necessary for the report of severity information.

If this parameter is configured for no DTC, the Dem provides no DTC functional unit information.

(2) DemIUMPRGroup:

DTC severity according to ISO 14229-1. This parameter depends on the automotive manufacturer.

If it is not configured, the value is counted as 'no severity'. If this parameter is configured for no DTC, the Dem provides no DTC severity information.

(3) DemRatioId:

Unique Diagnostic Trouble Code value for UDS (Range: 0x000000 and 0xFFFFF are reserved for DTC groups by ISO 14229-1)

(4) DemRatioKind:

This parameter defines when a specific event memory entry is allowed to be stored in the NVRAM.

(5) DemDiagnosticEventRef:

DTC Class according to ISO 14229-1 [2013 version]. This parameter depends on the automotive manufacturer. If it is not configured, the value is marked as 'unclassified'. If this parameter is configured for no DTC, the Dem provides no DTC WWHOBDDTC class information.

(6) DemFunctionIdRef:

This parameter defines the DTC Attributes associated with the DemDTC.

(7) DemObdDTCRef:

This parameter defines the OBD DTC configuration associated with the DemDTC. It is allowed to have events without a OBD DTC.

5.23 DemDTCAAttributes

Parameter Name	Value	Parameter
DemAgingAllowed ⁽¹⁾		C
DemAgingCycleCounterThreshold ⁽²⁾		C
DemAgingCycleCounterThresholdForTFSLC ⁽³⁾		C
DemDTCPriority ⁽⁴⁾		C
DemDTCSignificance ⁽⁵⁾		C
DemMaxNumberFreezeFrameRecords ⁽⁶⁾		C
DemAgingCycleRef ⁽⁷⁾		C
DemExtendedDataClassRef ⁽⁸⁾		C
DemFreezeFrameClassRef ⁽⁹⁾		C
DemFreezeFrameRecNumClassRef ⁽¹⁰⁾		C
DemJ1939ExpandedFreezeFrameClassRef ⁽¹¹⁾		C
DemJ1939FreezeFrameClassRef ⁽¹²⁾		C
DemMemoryDestinationRef ⁽¹³⁾		C
DemWWHOBDFreezeFrameClassRef ⁽¹⁴⁾		C

- (1) DemAgingAllowed:
Defines if a DTC can be aged.
TRUE: aging allowed
FALSE: aging not allowed
- (2) DemAgingCycleCounterThreshold:
Number of aging cycles needed to unlearn/delete the event.
- (3) DemAgingCycleCounterThresholdForTFSLC:
Number of aging cycles needed to reset the testFailedSinceLastClear Bit.
- (4) DemDTCPriority:
Priority of the event/dtc, in view of full event memory. A lower value means higher priority.
- (5) DemDTCSignificance:
Significance of the event, which indicates additional information concerning fault classification and resolution. It can be mapped as Dem-internal data element. It shall be configured, if it is a part of event related data.
- (6) DemMaxNumberFreezeFrameRecords:
This parameter defines the number of according freeze frame records, which can maximal be stored for this event. Therefore all these freeze frame records have the same freeze frame class.
This parameter is only required for calculated record numeration (refer to DemTypeOffreezeFrameRecordNumeration).
- (7) DemAgingCycleRef:
Reference to the cycle which is triggering the aging of the event.
- (8) DemExtendedDataClassRef:
This reference defines the link to an extended data class sampler.
- (9) DemFreezeFrameClassRef:
These references define the links to a freeze frame class sampler.

(10) DemFreezeFrameRecNumClassRef:

This parameter defines the list of dedicated freeze frame record numbers associated with the diagnostic event. These record numbers are assigned to the freeze frame records (instead of calculated record numbers). This parameter is only required for configured record numeration (refer to DemTypeOfFreezeFrameRecordNumeration).

(11) DemJ1939ExpandedFreezeFrameClassRef:

These references define the links to a J1939 freeze frame class sampler.

(12) DemOBDDWarmUpCycleRef:

These references define the links to a J1939 freeze frame class sampler.

(13) DemMemoryDestinationRef:

The memory destination assigns DTCs to one or two memory destinations. If more than one memory destination is assigned to a specific DTC, the DTC can be present in the corresponding event memories. In this case one of the references has to be DemMirrorMemory.

(14) DemWWHOBDFreezeFrameClassRef:

This reference defines the link to a WWH-OBD freeze frame class sampler.

5.24 DemDebounceTimeBaseClass

Parameter Name	Value	Parameter
DemDebounceBehavior ⁽¹⁾		C
DemDebounceTimeFailedThreshold ⁽²⁾		C
DemDebounceTimePassedThreshold ⁽³⁾		C
DemTimeBasedFdcThresholdStorageValue ⁽⁴⁾		C

(1) DemDebounceBehavior:

This parameter defines how the event debounce algorithm will behave, if a related enable condition is not fulfilled or ControlDTCSetting of the related event is disabled.

(2) DemDebounceTimeFailedThreshold:

Defines the time out duration for "Event Failed" qualification.

The AUTOSAR configuration standard is to use SI units, so this parameter is defined as float value in seconds. Dem configuration tools must convert this float value to the appropriate value format for the use in the software implementation of Dem.

(3) DemDebounceTimePassedThreshold:

Defines the time out duration for "Event Passed" qualification.

The AUTOSAR configuration standard is to use SI units, so this parameter is defined as float value in seconds. Dem configuration tools must convert this float value to the appropriate value format for the use in the software implementation of Dem.

(4) DemTimeBasedFdcThresholdStorageValue:

Threshold to allocate an event memory entry and to capture the Freeze Frame.

5.25 DemDtrs

This container holds the configuration of DTRs collection.

Parameter Name	Value	Parameter
DemDtr ⁽¹⁾		C

(1) DemDtr:

This container holds the configuration of one individual DTR

5.25.1 DemDtr

Parameter Name	Value	Parameter
DemDtrCompuDenominator0 ⁽¹⁾		C
DemDtrCompuNumerator0 ⁽²⁾		C
DemDtrCompuNumerator1 ⁽³⁾		C
DemDtrId ⁽⁴⁾		C
DemDtrMid ⁽⁵⁾		C
DemDtrTid ⁽⁶⁾		C
DemDtrUasid ⁽⁷⁾		C
DemDtrUpdateKind ⁽⁸⁾		C
DemDtrEventRef ⁽⁹⁾		C

(1) DemDtrCompuDenominator0:

Part of the conversion between the binary representation and the physical meaning analogous to the SW-C Template conversion CompuRationalCoeffs with 2 numerator coefficients and 1 denominator coefficient in the direction compuInternalToPhys.

The value 0 is not allowed.

(2) DemDtrCompuNumerator0:

Part of the conversion between the binary representation and the physical meaning analogous to the SW-C Template conversion CompuRationalCoeffs with 2 numerator coefficients and 1 denominator coefficient in the direction compuInternalToPhys.

(3) DemDtrCompuNumerator1:

Part of the conversion between the binary representation and the physical meaning analogous to the SW-C Template conversion CompuRationalCoeffs with 2 numerator coefficients and 1 denominator coefficient in the direction compuInternalToPhys.

(4) DemDtrId:

The index identifier value assigned to this DTR. The value is generated during the Dem configuration process.

(5) DemDtrMid:

The OBDMID of the DTR.

(6) DemDtrTid:

The OBDDID of the DTR.

(7) DemDtrUasid:

The UaSid the DTR data shall be scaled to, and reported together with the rescaled DTR data.

(8) DemDtrUpdateKind:

Update conditions applied by the Dem to reports of DTR values. Only supported if a related Event is configured.

(9) DemDtrEventRef:

Reference to the DemEventParameter this DTR is related to. If the related event is not configured, the Dem cannot ensure consistency between the DTR and the event.

5.26 DemEventParameter

Parameter Name	Value	Parameter
DemCausalityDelayTime ⁽¹⁾		C
DemComponentPriority ⁽²⁾		C
DemEventAvailable ⁽³⁾		C
DemEventConfirmationThreshold ⁽⁴⁾		C
DemEventFailureCycleCounterThresholdAdaptable ⁽⁵⁾		C
DemEventId ⁽⁶⁾		C
DemEventKind ⁽⁷⁾		C
DemEventRecoverableInSameOperationCycle ⁽⁸⁾		C
DemFFPPrestorageInNvm ⁽⁹⁾		C
DemFFPPrestorageSupported ⁽¹⁰⁾		C
DemReportBehavior ⁽¹¹⁾		C
DemComponentClassRef ⁽¹²⁾		C
DemDTCRef ⁽¹³⁾		C
DemEnableConditionGroupRef ⁽¹⁴⁾		C
DemOBDDGroupingAssociativeEventsRef ⁽¹⁵⁾		C
DemOperationCycleRef ⁽¹⁶⁾		C
DemStorageConditionGroupRef ⁽¹⁷⁾		C
DemCallbackClearEventAllowed ⁽¹⁸⁾		C
DemCallbackEventDataChanged ⁽¹⁹⁾		C
DemCallbackEventUdsStatusChanged ⁽²⁰⁾		C
DemCallbackInitMForE ⁽²¹⁾		C
DemCallbackMonitorStatusChanged ⁽²²⁾		C
DemDebounceAlgorithmClass ⁽²³⁾		C
DemIndicatorAttribute ⁽²⁴⁾		C

(1) DemCausalityDelayTime:

Time to wait until the event is considered as causal. The parameter is specified in seconds.

(2) DemComponentPriority:

Specifies the priority within the component. A lower value means higher priority.

(3) DemEventAvailable:

This parameter configures an Event as unavailable. It is treated by Dem as if it does not exist. true = Event is available false = Event is not available.

(4) DemEventConfirmationThreshold:

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Defines the operation cycle threshold of the DTC confirmation status according "Confirmation Threshold" of ISO 14229-1.

- (5) DemEventFailureCycleCounterThresholdAdaptable:
Indicates whether the events confirmation Cycle threshold can be adapted by Dem_SetEventFailureCycleCounterThreshold.
- (6) DemEventId:
Unique identifier of a diagnostic event.
This parameter should not be changeable by user, because the Id should be generated by Dem itself to prevent gaps and multiple use of an Id. The events should be sequentially ordered beginning with 1 and no gaps in between.
- (7) DemEventKind:
This parameter is used to distinguish between SW-C and BSW events.
- (8) DemEventRecoverableInSameOperationCycle:
If parameter is configured to FALSE, reporting of PASSED will be ignored if the event is already "testfailed this operation cycle".
- (9) DemFFPrestorageInNvm:
If the event uses a pre-stored freeze-frame this attribute indicates if the event requires the pre-stored data to be stored in non-volatile memory. TRUE = store the pre-stored data in non-volatile memory, FALSE = pre-stored data is not stored in non-volatile memory.
- (10) DemFFPrestorageSupported:
If this parameter is set to true, then the Prestorage of FreezeFrames is supported by the assigned event. This parameter is useful to calculate the buffer size.
- (11) DemReportBehavior:
Indicates the reporting behavior of the BSW Module (DemEventKind == DEM_EVENT_KIND_BSW) in order to determine the size of the reporting queue.
If the parameter is not defined it means REPORT_BEFORE_INIT.
- (12) DemComponentClassRef:
Reference to the monitored component.
- (13) DemDTCRef:
This parameter defines the DTC configuration (typically Uds) associated with the diagnostic event.
It is allowed to have events without a DTC (e.g. for ECU-internal events triggering safety reactions without being reported via diagnostic communication). The same DemDTCAttributes can be used from several events, to combine these (refer to chapter "Combination of diagnostic event").
- (14) DemEnableConditionGroupRef:
References an enable condition group.
- (15) DemOBDDGroupingAssociativeEventsRef:
This parameter defines a reference which points to a representative event of one group of associate events. The "reverence event" must refer to it self. Note: One event is only allowed to be reverenced to only one group of associate events.
- (16) DemOperationCycleRef:
Kind of operation cycle for the event (e.g. power cycle, driving cycle, ...)
- (17) DemStorageConditionGroupRef:
References a storage condition group.
- (18) DemCallbackClearEventAllowed:
The presence of this container indicates that the Dem has access to a "ClearEventAllowed" callback.

In case there is a DemCallbackClearEventAllowedFnc, this parameter defines the name of the function that the Dem will call.

In case there is no DemCallbackClearEventAllowedFnc, the Dem will have an R-Port requiring the interface CallbackClearEventAllowed whose name is generated by using the unique callback-prefix followed by the event name.

(19) DemCallbackEventDataChanged:

The presence of this container indicates that the Dem has access to an "EventDataChanged" callback.

In case there is a DemCallbackEventDataChangedFnc, this parameter defines the name of the function that the Dem will call.

In case there is no DemCallbackEventDataChangedFnc, the Dem will have an R-Port requiring the interface CallbackEventDataChanged whose name is generated by using the unique callback-prefix followed by the event name.

(20) DemCallbackEventUdsStatusChanged:

The presence of this container indicates, that the Dem has access to an "EventUdsStatusChanged" callback, which the Dem will call to notify other components about the change in the status of an event.

In case there is a DemCallbackEventUdsStatusChangedFnc, this parameter defines the name of the function that the Dem will call.

In case there is no DemCallbackEventUdsStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackEventUdsStatusChanged, whose name is generated by using the unique callback-prefix followed by the event name.

(21) DemCallbackInitMForE:

The presence of this container indicates, that the Dem has access to an "InitMonitorForEvent" callback, which the Dem will call to initialize a monitor.

In case the container has a DemCallbackInitMForEFnc, this parameter defines the name of the function that the Dem will call. In case there is no DemCallbackInitMForEFnc, the Dem will have an R-Port requiring the interface CallbackInitMonitorForEvent, whose name is generated by using the unique callback-prefix followed by the event name.

(22) DemCallbackMonitorStatusChanged:

The presence of this container indicates, that the Dem has access to an "MonitorStatusChanged" callback, which the Dem will call to notify other components about the change in the status of an event.

In case there is a DemCallbackMonitorStatusChangedFnc, this parameter defines the name of the function that the Dem will call. In case there is no DemCallbackMonitorStatusChangedFnc, the Dem will have an R-Port requiring the interface CallbackMonitorStatusChanged, whose name is generated by using the unique callback-prefix followed by the event name.

(23) DemDebounceAlgorithmClass:

Debounce algorithm class: counter based, time based, or monitor internal.

(24) DemIndicatorAttribute:

This container contains the event specific configuration of Indicators.

5.26.1 DemCallbackClearEventAllowed

Parameter Name	Value	Parameter
DemCallbackClearEventAllowedFnc ⁽¹⁾		C
DemClearEventAllowedBehavior ⁽²⁾		C

- (1) DemCallbackClearEventAllowedFnc:
Function name of prototype "ClearEventAllowed".
- (2) DemClearEventAllowedBehavior:
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.

5.26.2 DemCallbackEventDataChanged

Parameter Name	Value	Parameter
DemCallbackEventDataChangedFnc ⁽¹⁾		C

- (1) DemCallbackEventDataChangedFnc:
Function name of prototype "EventDataChanged".

5.26.3 DemCallbackEventUdsStatusChanged

Parameter Name	Value	Parameter
DemCallbackEventUdsStatusChangedFnc ⁽¹⁾		C

- (1) DemCallbackEventUdsStatusChangedFnc:
Function name of prototype "Dem_CBEventUdsStatusChanged".

5.26.4 DemCallbackInitMForE

Parameter Name	Value	Parameter
DemCallbackInitMForEFnc ⁽¹⁾		C

- (1) DemCallbackInitMForEFnc:
The presence of this container indicates, that the Dem has access to an "InitMonitorForEvent" callback, which the Dem will call to initialize a monitor.
In case the container has a DemCallbackInitMForEFnc, this parameter defines the name of the function that the Dem will call.
In case there is no DemCallbackInitMForEFnc, the Dem will have an R-Port requiring the interface CallbackInitMonitorForEvent, whose name is generated by using the unique callback-prefix followed by the event name.

5.26.5 DemCallbackMonitorStatusChanged

Parameter Name	Value	Parameter
DemCallbackMonitorStatusChangedFnc ⁽¹⁾		C

- (1) DemCallbackMonitorStatusChangedFnc:
Function name of prototype "<Module>_DemTriggerOnMonitorStatus"

5.26.6 DemDebounceAlgorithmClass

Parameter Name	Value	Parameter
DemCallbackClearEventAllowedFnc ⁽¹⁾		C
DemClearEventAllowedBehavior ⁽²⁾		C

- (1) DemCallbackClearEventAllowedFnc:
Function name of prototype "ClearEventAllowed".
- (2) DemClearEventAllowedBehavior:
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.

5.26.6.1 DemDebounceCounterBased

Parameter Name	Value	Parameter
DemCallbackClearEventAllowedFnc ⁽¹⁾		C
DemClearEventAllowedBehavior ⁽²⁾		C

- (1) DemCallbackClearEventAllowedFnc:
Function name of prototype "ClearEventAllowed".
- (2) DemClearEventAllowedBehavior:
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.

5.26.6.2 DemDebounceMonitorInternal

Parameter Name	Value	Parameter
DemCallbackClearEventAllowedFnc ⁽¹⁾		C
DemClearEventAllowedBehavior ⁽²⁾		C

- (1) DemCallbackClearEventAllowedFnc:
Function name of prototype "ClearEventAllowed".
- (2) DemClearEventAllowedBehavior:
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.

5.26.6.3 DemDebounceTimeBase

Parameter Name	Value	Parameter
DemCallbackClearEventAllowedFnc ⁽¹⁾		C
DemClearEventAllowedBehavior ⁽²⁾		C

- (1) DemCallbackClearEventAllowedFnc:
Function name of prototype "ClearEventAllowed".
- (2) DemClearEventAllowedBehavior:
Defines the resulting UDS status byte for the related event, which must not be cleared according to the ClearEventAllowed callback.

5.26.7 DemIndicatorAttribute

Parameter Name	Value	Parameter
DemIndicatorBehaviour ⁽¹⁾		C
DemIndicatorFailureCycleCounterThreshold ⁽²⁾		C
DemIndicatorHealingCycleCounterThreshold ⁽³⁾		
DemIndicatorRef ⁽⁴⁾		

- (1) DemIndicatorBehaviour:
Behaviour of the linked indicator.
- (2) DemIndicatorFailureCycleCounterThreshold:
Defines the number of failure cycles for the WarningIndicatorOnCriteria.
- (3) DemIndicatorHealingCycleCounterThreshold:
Defines the number of healing cycles for the WarningIndicatorOffCriteria.
- (4) DemIndicatorRef:
Reference to the used indicator.

5.27 DemMultiEventTriggering

Parameter Name	Value	Parameter
DemMultiEventTriggeringMasterEventRef ⁽¹⁾		C
DemMultiEventTriggeringSlaveEventRef ⁽²⁾		C

- (1) DemMultiEventTriggeringMasterEventRef:
Function name of prototype "ClearEventAllowed".
- (2) DemMultiEventTriggeringSlaveEventRef:
Reference to the event that is triggered upon triggering the master event.

5.28 DemObdDTC

Parameter Name	Value	Parameter
DemConsiderPtoStatus ⁽¹⁾		C
DemDtcValue ⁽²⁾		C
DemEventOBDRreadinessGroup ⁽³⁾		C
DemJ1939DTCValue ⁽⁴⁾		C
DemDtcValue3Byte ⁽⁵⁾		C

(1) DemConsiderPtoStatus:

This parameter is TRUE, when the event is affected by the Dem PTO handling.

(2) DemDtcValue:

Unique Diagnostic Trouble Code value for OBD.

(3) DemEventOBDRreadinessGroup:

This parameter specifies the Event OBD Readiness group for PID \$01 and PID \$41 computation. This parameter is only applicable for emission-related ECUs.

(4) DemJ1939DTCValue:

Reference to the event that is triggered upon triggering the master event.

(5) DemDTCValue3Byte:

3 Byte OBD DTC value that is used for the UDS Diagnostic Trouble Code (DTC) if UDS and OBD DTC handling is separated. The value is defining a DTC based on SAE J2012.

5.29 DemPidClass

Parameter Name	Value	Parameter
DemPidIdentifier ⁽¹⁾		C
DemPidDataElement ⁽²⁾		C

(1) DemPidIdentifier:

This parameter is TRUE, when the event is affected by the Dem PTO handling.

(2) DemPidDataElement:

This container contains the different data elements contained in the specific PID.

6 Application Programming Interface (API)

6.1 Type Definitions

6.1.1 Dem_DataType_{Data}

Name:	Dem_DataType_{Data}	
Kind	Type	
Derived from	Base Type	Variation
	Dem_DataArrayType_{Data} {ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == [S U]INT[8 16 32]_N) ((Dem/ DemGeneral/DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == [S U]INT[8 16 32]_N))}	
	Dem_DataPrimitiveType_{Data}	{ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]) ((Dem/ DemGeneral/DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]))))}
Description:	Data type definition for external data elements	
Variation	((({ecuc(Dem/DemGeneral/DemDataElementClass)} instanceof {ecuc(Dem/DemGeneral/DemDataElementClass/ DemExternalCSDataElementClass)}) && ({ecuc(Dem/DemGeneral/ DemDataElementClass/DemExternalCSDataElementClass/ DemDataElementUsePort)} == true)) ({ecuc(Dem/DemGeneral/ DemDataElementClass)} instanceof {ecuc(Dem/DemGeneral/ DemDataElementClass/DemExternalSRDataElementClass)})) Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}	
Available via	Rte_Dem_Type.h	

6.1.2 Dem_EventIdType

Name:	Dem_DataPrimitiveType_{Data}	
Kind	Type	
Derived from	Base Type	Variation
	boolean	{ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == BOOLEAN) ((Dem/DemGeneral/

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		DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == BOOLEAN}}
sint16		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == SINT16) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT16))}}
sint32		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == SINT32) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT32))}}
sint8		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == SINT8) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT8))}}
uint16		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == UINT16) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT16))}}
uint32		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == UINT32) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT32))}}
uint8		{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDDataElementClass/ DemDataElementDataType) == UINT8))}}

		DemDataElementDataType) == UINT8) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT8}}
Description:	--	
Variation	{(ecuc((Dem/DemGeneral/DemDataElementClass/ DemExternalCSDataElementClass/DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]) ((Dem/DemGeneral/ DemDataElementClass/DemExternalSRDataElementClass/ DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]))))} Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}	
Available via	Rte_Dem_Type.h	

6.1.3 Dem_DataArrayType

Name:	Dem_DataArrayType_{Data}	
Kind	Array	
Derived from	Base Type	Variation
	sint16	{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == SINT16_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT16_N)))}
	sint32	{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == SINT32_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT32_N)))}
	sint8	{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == SINT8_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == SINT8_N)))}
	uint16	{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == UINT16_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT16_N)))}

		DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == UINT16_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT16_N))}
	uint32	{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == UINT32_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT32_N))}}
	uint8	{{(ecuc((Dem/DemGeneral/ DemDataElementClass/ DemExternalCSDataElementClass/ DemDataElementDataType) == UINT8_N) ((Dem/DemGeneral/ DemDataElementClass/ DemExternalSRDataElementClass/ DemDataElementDataType) == UINT8_N))}}
Description:	--	
Variation	{{(ecuc((Dem/DemGeneral/DemDataElementClass/ DemExternalCSDataElementClass/DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]) ((Dem/DemGeneral/ DemDataElementClass/DemExternalSRDataElementClass/ DemDataElementDataType) == (BOOLEAN [S U]INT[8 16 32]))))} Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}}	
Available via	Rte_Dem_Type.h	

6.1.4 Dem_DTCOriginType

Name:	Dem_DTCOriginType		
Kind	Type		
Derived from	uint16		
Description:	This enum is used to define the location of the events. The definition and use of the different memory types is OEM-specific.		
Range	DEM_DTC_ORIGIN_PRIMARY_MEMORY	0x0001	Event information located in the primary memory
	DEM_DTC_ORIGIN_MIRROR_MEMORY	0x0002	Event information located in the mirror memory

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	DEM_DTC_ORIGIN_PERMANENT_MEMORY	0x0003	The Event information is located in the permanent memory
	DEM_DTC_ORIGIN_OBD_RELEVANT_MEMORY	0x0004	Selects all memories which are storing OBD events (specified by configuration)
	DEM_DTC_ORIGIN_USERDEFINED_MEMORY_<Name>	0x01XX	Event information located in the user defined memory, where XX is the configured DemUserDefinedMemoryId entifier in hexadecimal and <Name> is the Short-Name of the DemUserDefinedMemory.
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.5 Dem_DebouncingStateType

Name:	Dem_DebouncingStateType			
Kind	Bitfield			
Derived from	uint8			
Elements	Kind	Name	Mask	Description
	bit	DEM_TEMPORARILY_DEFECTIVE	0x01	Bit 0: Temporarily Defective (corresponds to 0 < FDC < 127)
	bit	DEM_FINALLY_DEFECTIVE	0x02	Bit 1: finally Defective (corresponds to FDC = 127)
	bit	DEM_TEMPORARILY_HEALED	0x04	Bit 2: temporarily healed (corresponds to -128 < FDC < 0)
	bit	DEM_TEST_COMPLETE	0x08	Bit 3: Test complete (corresponds to FDC = -128 or FDC = 127)
	bit	DEM_DTR_UPDATE	0x10	Bit 4: DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
Variation	--			
Available via	Rte_Dem_Type.h			

6.1.6 Dem_DebounceResetStatusType

Name:	Dem_DebounceResetStatusType		
Kind	Bitfield		
Derived from	uint8		
Description	This type contains all definitions to control an internal debounce counter/timer via the function Dem_ResetEventDebounceStatus().		
Range	DEM_DEBOUNCE_STATUS_FREEZE	0x01	Freeze the internal debounce counter/timer.
	DEM_DEBOUNCE_STATUS_RESET	0x02	Reset the internal debounce counter/timer.
		0x02 - 0xFF	reserved
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.7 Dem_DTRControlType

Name:	Dem_DTRControlType		
Kind	Type		
Derived from	uint8		
Description	Control parameter for the interpretation of the reported test results.		
Range	DEM_DTR_CTL_NORMAL	0x00	Values are reported and regarded as valid test result
	DEM_DTR_CTL_NO_MAX	0x01	Values are reported, but maximum limit is not available (not valid); upper limit value is ignored.
	DEM_DTR_CTL_NO_MIN	0x02	Values are reported, but minimum limit is not available (not valid); lower limit value is ignored.
	DEM_DTR_CTL_RESET	0x03	Values are all ignored. External representation will be all zeros as initialized (e.g. after fault clear)
	DEM_DTR_CTL_INVISIBLE	0x04	Values are all ignored. This DTR is treated for the external view (tester) as if not integrated.
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.8 Dem_EventIdType

Name:	Dem_EventIdType		
Kind	Bitfield		
Derived from	uint16		
Description	Identification of an event by assigned EventId. The EventId is assigned by the Dem. Example: 1 refers to monitor x, 2 refers to monitor y, etc.		
Range	1.65536	Internal identifier of a diagnostic event Remark: 0 is not a valid value	
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.9 Dem_EventStatusType

Name:	Dem_EventStatusType		
Kind	Type		
Derived from	uint8		
Description	This type contains all monitor test result values, which can be reported via Dem_SetEventStatus().		
Range Variation	DEM_DEBOUNCE_STATUS_FREEZE	0x00	Monitor reports qualified test result passed.
	DEM_EVENT_STATUS_FAILED	0x01	Monitor reports qualified test result failed.
	DEM_EVENT_STATUS_PREPASSED	0x02	Monitor reports non-qualified test result pre-passed (debounced Dem-internally).
	DEM_EVENT_STATUS_PREFAILED	0x03	Monitor reports non-qualified test result pre-failed (debounced Dem-internally).
	DEM_EVENT_STATUS_FDC_THRESHOLD_REACHED	0x04	Monitor triggers the storage of ExtendedDataRecords and FreezeFrames ON_FDC_THRESHOLD.
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.10 Dem_DTCFormatType

Name:	Dem_DTCFormatType		
Kind	Bitfield		
Derived from	Type		
Description	This type is used to select the format of the DTC value.		
Range	DEM_DTC_FORMAT_OBD	0	selects the 2-byte OBD DTC format (refer to configuration parameter DemObdDTC)
	DEM_DTC_FORMAT_UDS	1	selects the 3-byte UDS DTC format (refer to configuration parameter DemUdsDTC)
	DEM_DTC_FORMAT_J1939	2	selects the merged SPN + FMI to 3-byte J1939 DTC format (refer to DemJ1939DTC)
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.11 Dem_InitMonitorReasonType

Name:	Dem_DebounceResetStatusType		
Kind	Type		
Derived from	uint8		
Description	(Re-)Initialization reason returned by the callback <Module>_DemInitMonitorFor<EventName>().		
Range	DEM_INIT_MONITOR_CLEAR	0x01	Freeze the internal debounce counter/timer.
	DEM_INIT_MONITOR_RESTART	0x02	Reset the internal debounce counter/timer.
	DEM_INIT_MONITOR_REENABLED	0x03	Enable conditions or DTC settings re-enabled
	DEM_INIT_MONITOR_STORAGE_REENABLED	0x04	Storage condition reenabled.
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.12 Dem_lumprDenomCondIdType

Name:	Dem_lumprDenomCondIdType		
Kind	Type		
Derived from	uint8		

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Description	This type contains all definitions to control an internal debounce counter/timer via the function Dem_ResetEventDebounceStatus().		
Range Variation	DEM_IUMPR_DEN_COND_COLDSTART	0x02	Additional IUMPR denominator condition "Cold Start"
	DEM_IUMPR_DEN_COND_EVAP	0x03	Additional IUMPR denominator condition "EVAP"
	DEM_IUMPR_DEN_COND_500MI	0x04	Additional IUMPR denominator condition "500 miles"
	DEM_IUMPR_GENERAL_INDIVIDUAL_DENOMINATOR	0x05	Individual denominators to Support different conditions than the general denominator. It acts on individual denominators and allows a different condition to be set than for the general denominator. If the standard individual denominator conditions differ from the general denominator conditions, they typically differ by a "fueled engine" criterion.
	DEM_IUMPR_GENERAL_OBDCOND	0x06	IUMPR denominator condition "General Denominator" for output with Infotype \$08/\$0B
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.13 Dem_DebounceResetStatusType

Name:	Dem_DebounceResetStatusType		
Kind	Bitfield		
Derived from	uint8		
Description	This type contains all definitions to control an internal debounce counter/timer via the function Dem_ResetEventDebounceStatus().		
Range Variation	DEM_DEBOUNCE_STATUS_FREEZE	0x01	Freeze the internal debounce counter/timer.
	DEM_DEBOUNCE_STATUS_RESET	0x02	Reset the internal debounce counter/timer.
		0x02 - 0xFF	reserved
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.14 Dem_MaxDataValueType

Name	Dem_MaxDataValueType
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Kind	Array	Element type	uint8
Size	size of largest Extended data class / Freeze frame record Elements		
Description	--		
Variation	---		
Available via	Rte_Dem_Type.h		

6.1.15 Dem_MonitorDataType

Name	Dem_MonitorDataType
Kind	Type
Derived from	uint32
Description	This type is used to pass monitoring data to the Dem.
Variation	---
Available via	Rte_Dem_Type.h

6.1.16 Dem_MonitorStatusType

Name	Dem_MonitorStatusType			
Kind	Bitfield			
Derived from	uint8			
Elements	Kind	Name	Mask	Description
	bit	DEM_MONITOR_STATUS_TF	0x01	Bit0: TestFailed
	bit	DEM_MONITOR_STATUS_TNCTOC	0x02	Bit1: TestNotCompletedThisOperationCycle
Description	This type is used to pass monitoring data to the Dem			
Variation	---			
Available via	Rte_Dem_Type.h			

6.1. 17 Dem_IndicatorStatusType

Name	Dem_IndicatorStatusType		
Kind	Type		
Derived from	uint8		
Description	This type is used to pass monitoring data to the Dem		
Range	DEM_INDICATOR_OFF	0x00	Indicator off mode
	DEM_INDICATOR_CONTINUOUS	0x01	Indicator continuously on mode
	DEM_INDICATOR_BLINKING	0x02	Indicator blinking mode
	DEM_INDICATOR_BLINK_CONT	0x03	Indicator blinking or continuously on mode
	DEM_INDICATOR_SLOW_FLASH	0x04	Indicator slow flashing mode
	DEM_INDICATOR_FAST_FLASH	0x05	Indicator fast flashing mode

	DEM_INDICATOR_ON_DEMAND	0x06	Indicator on-demand mode
	DEM_INDICATOR_SHORT	0x07	Indicator short mode
Variation	---		
Available via	Rte_Dem_Type.h		

6.1.17 Dem_IndicatorStatusType

Name	Dem_IndicatorStatusType			
Kind	uint8	Element type	uint8	
Elements	Kind	Name	Mask	Description
	bit	DEM_MONITOR_STATUS_TF	0x01	Bit0: TestFailed
	bit	DEM_MONITOR_STATUS_TNCTOC	0x02	Bit1: TestNotCompletedThisOperationCycle
Description	This type is used to pass monitoring data to the Dem			
Variation	---			
Available via	Rte_Dem_Type.h			

6.1.18 Dem_PID21valueType

Name	Dem_PID21valueType		
Kind	Array	Element type	uint8
Derived from	uint32		
Size	2 Elements		
Description	--		
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.19 Dem_PID31valueType

Name	Dem_PID31valueType		
Kind	Array	Element type	uint8
Size	2 Elements		
Description	--		
Variation	--		
Available via	Rte_Dem_Type.h		

6.1.20 Dem_RatioldType

Name	Dem_RatioldType	
Kind	uint8	
Derived from	Base Type	Variation
	uint16	Configurable, size depends on system

		complexity (refer to range of configuration parameter DemRatiold)
	uint8	Configurable, size depends on system complexity (refer to range of configuration parameter DemRatiold)
Description	OBD specific ratio Id (related to a specific event, a FID, and an IUMPR group). This type depends on the Dem configuration.	
Range	0..255, 0..65535	Configurable, size depends on system complexity (refer to range of configuration parameter DemRatiold)
Variation	---	
Available via	Rte_Dem_Type.h	

6.1.21 Dem_UdsStatusByteType

Name	Dem_UdsStatusByteType			
Kind	Bitfield			
Derived from	uint8			
Size	2 Elements			
Lower limit	0x00 Elements			
Upper limit	0xFF Elements			
Elements	Kind	Name	Mask	Description
	bit	DEM_ UDS_ STATUS_ TF	0x01	bit 0: TestFailed
	bit	DEM_ UDS_ STATUS_ TFTOC	0x02	bit 0: TestFailed
	bit	DEM_ UDS_ STATUS_ PDTC	0x04	bit 2: PendingDTC
	bit	DEM_ UDS_ STATUS_ CDTC	0x08	bit 3: ConfirmedDTC
	bit	DEM_ UDS_ STATUS_ TNCSLC	0x10	bit 4: TestNotCompletedSinceLastClear
	bit	DEM_ UDS_ STATUS_ TFSLC	0x20	bit 5: TestFailedSinceLastClear
	bit	DEM_ UDS_ STATUS_ TNCTOC	0x40	bit 6: TestNotCompletedThisOperation Cycle
Description	bit	DEM_ UDS_ STATUS_ WIR	0x80	bit 7: WarningIndicatorRequested
	In this data-type each bit has an individual meaning. The bit is set to 1 when the condition holds. For example, if the 2nd bit (0x02) is set to 1, this means that the test failed this operation cycle. If the bit is set to 0, it has not yet failed this cycle.			
Available via	Rte_Dem_Type.h			

6.1.22 Dem_PID4DvalueType

Name	Dem_PID4DvalueType
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Kind	Array	Element type	uint8
Size	2 Elements		
Description	--		
Available via	Rte_Dem_Type.h		

6.1.23 Dem_PID4EvalType

Name	Dem_PID4EvalType		
Kind	Array	Element type	uint8
Size	2 Elements		
Description	--		
Available via	Rte_Dem_Type.h		

6.1.24 Dem_J1939DcmSetFreezeFrameFilterType

Name	Dem_J1939DcmSetFreezeFrameFilterType		
Kind	uint8		
Range	DEM_J1939DCM_FREEZEFRAME	0	FreezeFrame (DM04)
	DEM_J1939DCM_EXPANDED_FREEZEFRAME	1	ExpandedFreezeFrame (DM25)
	DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME	2	SPNs in ExpandedFreezeFrame (DM24)
Description	The type to distinguish which DTCs gets cleared		
Available via	Dem.h		

6.1.25 Dem_J1939DcmLampStatusType

Name	Dem_J1939DcmLampStatusType		
Kind	Structure		
Element	uint8	LampStatus	lamp status
	uint8	FlashLampStatus	flash lamp status
Description	For details refer SAE J1939-73		
Available via	Dem.h		

6.1.26 Dem_J1939DcmDiagnosticReadiness1Type

Name	Dem_J1939DcmDiagnosticReadiness1Type		
Kind	Structure		
Element	uint8	ActiveTroubleCodes	Number of active DTCs
	uint8	PreviouslyActiveDiagnosticTroubleCodes	Number of previously active DTCs
	uint8	OBDCompliance	OBD Compliance

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	uint8	Continuously MonitoredSystems Support_Status	Identifies the continuously monitored system support and status
	uint8	NonContinuously MonitoredSystems Support5	Identifies the noncontinuously monitored systems support (byte5)
	uint8	NonContinuously MonitoredSystems Support6	Identifies the noncontinuously monitored systems support (byte6)
	uint8	NonContinuously MonitoredSystems Status7	Identifies the noncontinuously monitored systems status (byte7)
	uint8	NonContinuously MonitoredSystems Status8	Identifies the noncontinuously monitored systems status (byte8)
Description	This structure represents all data elemets of the DM05 message. The encoding shall be done acording SAE J1939-73		
Available via	Dem.h		

6.1.27 Dem_J1939DcmDiagnosticReadiness2Type

Name	Dem_J1939DcmDiagnosticReadiness2Type		
Kind	Structure		
Element	uint16	ActiveTroubleCodes	The kilometers accumulated while the MIL is activated
	uint16	DistanceSinceDTCs Cleared	Distance accumulated since emission related DTCs were cleared
	uint16	MinutesRunbyEngine WhileMILis Activated	Accumulated count (in minutes) while the MIL is activated (on)
	uint16	TimeSince DiagnosticTrouble CodesCleared	Engine running time accumulated since emission related DTCs were cleared
Description	This structure represents all data elemets of the DM21 message. The encoding shall be done acording SAE J1939-73		
Available via	Dem.h		

6.1.28 Dem_J1939DcmDiagnosticReadiness2Type

Name	Dem_J1939DcmDiagnosticReadiness3Type		
Kind	Structure		
Element	uint16	TimeSinceEngine Start	Time since key-on that the engine has been running.
	uint8	NumberOfWarmups SinceDTCsCleared	Number of OBD warm-up cycles since all DTCs were cleared
	uint8	MinutesRunbyEngine WhileMILis Activated	Accumulated count (in minutes) while the MIL is activated (on)
	uint8	Continuously MonitoredSystems EnableCompleted Status	Identifies the continuously monitored system enable/-completed support and status.
	uint8	NonContinuously MonitoredSystems EnableStatus5	Enable status of noncontinuous monitors this monitoring cycle (byte5)
	uint8	NonContinuously MonitoredSystems EnableStatus6	Enable status of noncontinuous monitors this monitoring cycle (byte6)
	uint8	NonContinuously MonitoredSystems7	Completion status of noncontinuous monitors this monitoring cycle (byte7)
	uint8	NonContinuously MonitoredSystems8	Completion status of noncontinuous monitors this monitoring cycle (byte8)
Description	This structure represents all data elemets of the DM21 message. The encoding shall be done acording SAE J1939-73		
Available via	Dem.h		

6.2 Macro Constants

6.3 Functions

6.3.1 Dem_GetVersionInfo

6.3.1.1 Dem_GetVersionInfo

Function Name	Dem_GetVersionInfo
Syntax	void Dem_GetVersionInfo(Std_VersionInfoType* versioninfo)
Service ID [Hex]	0x00
Sync/Async	Synchronous

Reentrancy	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. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemVersionInfoApi)} == true)	
Preconditions	None	
Configuration	None	
Dependency	None	
Available via	Dem.h	

6.3.2 Interface ECU State Manager <=> Dem

6.3.2.1 Dem_PreInit

Function Name	Dem_PreInit	
Syntax	void Dem_PreInit(void)	
Service ID [Hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non-Reentrant	
Parameters (In)	ConfigPtr	Pointer to configuration parameter set, used e.g. for post build parameters
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	None	
Description	Initializes the internal states necessary to process events reported by BSW-modules.	
Preconditions	None	
Configuration	None	
Dependency	None	
Available via	Dem.h	

6.3.2.2 Dem_Init

Function Name	Dem_Init	
Syntax	void Dem_Init(const Dem_ConfigType* ConfigPtr)	
Service ID [Hex]	0x02	
Sync/Async	Synchronous	
Reentrancy	Non-Reentrant	
Parameters (In)	ConfigPtr	Pointer to the configuration set in VARIANT-POSTBUILD.

Parameters (Inout)	None
Parameters (Out)	None
Return Value	None
Description	Initializes or reinitializes this module.
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.2.3 Dem_Shutdown

Function Name	Dem_Shutdown
Syntax	void Dem_Shutdown(void)
Service ID [Hex]	0x0b
Sync/Async	Synchronous
Reentrancy	Reentrant
Parameters (In)	None
Parameters (Inout)	None
Parameters (Out)	None
Return Value	None
Description	Shuts down this module.
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.3 Interface BSW modules / SW-Components <=> Dem

6.3.3.1 Dem_ClearDTC

Function Name	Dem_ClearDTC
Syntax	Std_ReturnType Dem_ClearDTC(uint8 ClientId)
Service ID [Hex]	0x23
Sync/Async	Asynchronous
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.
Parameters (In)	ClientId Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None
Parameters (Out)	None
Return Value	Std_ReturnType E_OK: DTC successfully cleared E_NOT_OK: No DTC selected

		<p>DEM_WRONG_DTC: Selected DTC value in selected format does not exist or clearing is restricted by configuration to group of all DTCs only.</p> <p>DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist</p> <p>DEM_CLEAR_FAILED: DTC clearing failed</p> <p>DEM_CLEAR_BUSY: Another client is currently clearing DTCs. The requested operation will not be started and the caller shall try again at a later moment.</p> <p>DEM_CLEAR_MEMORY_ERROR: An error occurred during erasing a memory location (e.g. if DemClearDTCBehavior is set to DEM_CLRRESP_NON-VOLATILE_FINISH and erasing of non-volatile-block failed).</p> <p>DEM_PENDING: Clearing the DTCs is currently in progress. The caller shall call this function again at a later moment.</p> <p>DEM_BUSY: A different Dem_SelectDTC dependent operation according to SW</p>
Description	Clears single DTCs, as well as groups of DTCs.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.2 Dem_ClearPrestoredFreezeFrame

Function Name	Dem_ClearPrestoredFreezeFrame	
Syntax	Std_ReturnType Dem_ClearPrestoredFreezeFrame(Dem_EventIdType EventId)	
Service ID [Hex]	0x07	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	<p>E_OK: Clear prestored freeze frame was successful</p> <p>E_NOT_OK: Clear prestored freeze frame failed</p>
Description	Shuts down this module.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.3 Dem_GetComponentFailed

Function Name	Dem_GetComponentFailed	
Syntax	Std_ReturnType Dem_GetComponentFailed(Dem_ComponentIdType ComponentId, boolean* ComponentFailed)	
Service ID [Hex]	0x2a	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	ComponentId	Identification of a DemComponent
Parameters (Inout)	None	
Parameters (Out)	ComponentFailed	TRUE: failed FALSE: not failed
Return Value	Std_ReturnType	E_OK: getting "ComponentFailed" was successful E_NOT_OK: getting "ComponentFailed" was not successful
Description	Gets the failed status of a DemComponent.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.4 Dem_GetDTCSelectionResult

Function Name	Dem_GetDTCSelectionResult	
Syntax	Std_ReturnType Dem_GetDTCSelectionResult(uint8 ClientId)	
Service ID [Hex]	0xb8	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: The DTC select parameter check is successful and the requested DTC or group of DTC in the selected origin is selected for further operations. E_NOT_OK: No DTC selected DEM_WRONG_DTC: Selected DTC value in selected format does not exist DEM_WRONG_DTCORIGIN: Selected DTCORIGIN does not exist DEM_PENDING: Checking the SelectDTC parameters is currently in progress. The caller shall call this function again later.

		DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Provides information if the last call to Dem_SelectDTC has selected a valid DTC or group of DTCs.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.5 Dem_GetDTCSelectionResultForClearDTC

Function Name	Dem_GetDTCSelectionResultForClearDTC	
Syntax	Std_ReturnType Dem_GetDTCSelectionResultForClearDTC(uint8 ClientId)	
Service ID [Hex]	0xbb	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: The DTC select parameter check is successful and the requested DTC or group of DTC in the selected origin is selected for further operations. DEM_WRONG_DTC: Selected DTC value in selected format does not exist or a single DTC was selected and Dem only supports to Clear all DTCs. DEM_WRONG_DTCORIGIN: Selected DTCORIGIN does not exist. DEM_PENDING: Checking the SelectDTC parameters is currently in progress. The caller shall call this function again later. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Provides information if the last call to Dem_SelectDTC has selected a valid DTC or group of DTCs, respecting the settings if the Dem shall clear only all DTCs.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.6 Dem_GetEventUdsStatus

Function Name	Dem_GetEventUdsStatus	
Syntax	Std_ReturnType Dem_GetEventUdsStatus(Dem_EventIdType EventId, Dem_UdsStatusByteType* UDSStatusByte)	
Service ID [Hex]	0xb6	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	UDSStatusByte	UDS DTC status byte of the requested event (refer to chapter "Status bit support"). If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: get of event status was successful E_NOT_OK: get of event status failed
Description	Gets the current UDS status byte assigned to the DTC for the event	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.7 Dem_GetMonitorStatus

Function Name	Dem_GetEventUdsStatus	
Syntax	Std_ReturnType Dem_GetMonitorStatus(Dem_EventIdType EventID, Dem_MonitorStatusType* MonitorStatus)	
Service ID [Hex]	0xb5	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	EventID	Identification of an event by assigned EventId
Parameters (Inout)	None	
Parameters (Out)	MonitorStatus	Monitor status byte of the requested event. If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Get monitor status was successful, E_NOT_OK: getting the monitor status failed (e.g. an invalid event id was provided).
Description	Gets the current monitor status for an event.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.8 Dem_GetDebouncingOfEvent

Function Name	Dem_GetDebouncingOfEvent	
Syntax	Std_ReturnType Dem_GetDebouncingOfEvent(Dem_EventIdType EventId, Dem_DebouncingStateType* DebouncingState)	
Service ID [Hex]	0x9f	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	DebouncingState	Bit 0 Temporarily Defective (corresponds to $0 < \text{FDC} < 127$) Bit 1 finally Defective (corresponds to $\text{FDC} = 127$) Bit 2 temporarily healed (corresponds to $-128 < \text{FDC} < 0$) Bit 3 Test complete (corresponds to $\text{FDC} = -128$ or $\text{FDC} = 127$) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
Return Value	Std_ReturnType	E_OK: get of debouncing status per event state successful E_NOT_OK: get of debouncing per event state failed
Description	Gets the debouncing status of an event. This function shall not be used for EventId with native debouncing within their functions. It is rather for EventIds using debouncing within the Dem.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.9 Dem_GetDTCOfEvent

Function Name	Dem_GetDebouncingOfEvent	
Syntax	Std_ReturnType Dem_GetDTCOfEvent(Dem_EventIdType EventId, Dem_DTCFormatType DTCFormat, uint32* DTCOfEvent)	
Service ID [Hex]	0x0d	
Sync/Async	Synchronous	
Reentrancy	Reentrant	

Parameters (In)	EventId	Identification of an event by assigned EventId.
	DTCFormat	Defines the output-format of the requested DTC value.
	DTCOfEvent	Receives the DTC value in respective format returned by this function. If the return value of the function is other than E_OK this parameter does not contain valid data.
Parameters (Inout)	None	
Parameters (Out)	DebouncingState	Bit 0 Temporarily Defective (corresponds to $0 < FDC < 127$) Bit 1 finally Defective (corresponds to $FDC = 127$) Bit 2 temporarily healed (corresponds to $-128 < FDC < 0$) Bit 3 Test complete (corresponds to $FDC = -128$ or $FDC = 127$) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
Return Value	Std_ReturnType	E_OK: get of debouncing status per event state successful E_NOT_OK: get of debouncing per event state failed
Description	Gets the debouncing status of an event. This function shall not be used for EventId with native debouncing within their functions. It is rather for EventIds using debouncing within the Dem.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.10 Dem_GetDTCsuppression

Function Name	Dem_GetDTCsuppression	
Syntax	Std_ReturnType Dem_GetDTCsuppression(uint8 ClientId, boolean* SuppressionStatus)	
Service ID [Hex]	0xbc	
Sync/Async	Asynchronous	
Reentrancy	Reentrant	
Parameters (In)	EventId	Unique client id, assigned to the instance of the calling module
Parameters (Inout)	SuppressionStatus	Defines whether the respective DTC is suppressed (TRUE) or enabled (FALSE).
Parameters (Out)	DebouncingState	Bit 0 Temporarily Defective (corresponds to $0 < FDC < 127$) Bit 1 finally Defective (corresponds to $FDC = 127$) Bit 2 temporarily healed (corresponds to $-128 < FDC$

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		< 0) Bit 3 Test complete (corresponds to FDC = -128 or FDC = 127) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
Return Value	Std_ReturnType	E_OK: get of debouncing status per event state successful E_NOT_OK: get of debouncing per event state failed
Description	Gets the debouncing status of an event. This function shall not be used for EventId with native debouncing within their functions. It is rather for EventIds using debouncing within the Dem.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.11 Dem_GetFaultDetectionCounter

Function Name	Dem_GetFaultDetectionCounter	
Syntax	Std_ReturnType Dem_GetFaultDetectionCounter(Dem_EventIdType EventId, sint8* FaultDetectionCounter)	
Service ID [Hex]	0xbc	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	FaultDetectionCounter	This parameter receives the Fault Detection Counter information of the requested EventId. If the return value of the function call is other than E_OK this parameter does not contain valid data. -128dec...127dec PASSED... FAILED according to ISO 14229-1
Return Value	Std_ReturnType	E_OK: request was successful E_NOT_OK: request failed DEM_E_NO_FDC_AVAILABLE: there is no fault detection counter available for the requested event
Description	Gets the fault detection counter of an event. This API can only be used through the RTE, and therefore no declaration is exported via Dem.h.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.12 Dem_GetIndicatorStatus

Function Name	Dem_GetIndicatorStatus	
Syntax	Std_ReturnType Dem_GetIndicatorStatus(uint8 IndicatorId, Dem_IndicatorStatusType* IndicatorStatus)	
Service ID [Hex]	0x29	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	IndicatorId	Number of indicator
Parameters (Inout)	None	
Parameters (Out)	IndicatorStatus	Status of the indicator, like off, on, or blinking.
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed
Description	Gets the indicator status derived from the UDS status. API Availability: This API will be available only if {ecuc(Dem/DemGeneral/DemEventMemorySet/DemIndicator)} !=NULL	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.13 Dem_GetEventFreezeFrameDataEx

Function Name	Dem_GetEventFreezeFrameDataEx	
Syntax	Std_ReturnType Dem_GetEventFreezeFrameDataEx(Dem_EventIdType EventId, uint8 RecordNumber, uint16 DataId, uint8* DestBuffer, uint16* BufSize)	
Service ID [Hex]	0x6e	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	IndicatorId	Identification of an event by assigned EventId.
	RecordNumber	This parameter is a unique identifier for a freeze frame record as defined in ISO14229-1. 0xFF means most recent freeze frame record is returned. 0x00 is only supported if the Dem module supports WWH-OBd (refer to DemOBdSupport)
	DataId	This parameter specifies the DID (ISO14229-1) that shall be copied to the destination buffer.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written

		to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the freeze frame data record shall be written to. The format is raw hexadecimal values and contains no header-information.
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation could not be performed DEM_NO_SUCH_ELEMENT: The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame. DEM_BUFFER_TOO_SMALL: The provided buffer size is too small
Description	Gets the data of a freeze frame by event.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.14 Dem_GetEventExtendedDataRecordEx

Function Name	Dem_GetEventFreezeFrameDataEx	
Syntax	Std_ReturnType Dem_GetEventExtendedDataRecordEx(Dem_EventIdType EventId, uint8 RecordNumber, uint8* DestBuffer, uint16* BufSize)	
Service ID [Hex]	0x6d	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	RecordNumber	Identification of requested Extended data record. Valid values are between 0x01 and 0xEF as defined in ISO14229-1.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the extended data shall be written to. The format is raw hexadecimal values and contains no header-information.
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation could not be performed

		DEM_NO_SUCH_ELEMENT: The requested event data is not currently stored (but the request was valid) OR the requested record number is not supported by the event. DEM_BUFFER_TOO_SMALL: The provided buffer size is too small.
Description	Gets the data of an extended data record by event.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.15 Dem_GetEventMemoryOverflow

Function Name	Dem_GetEventMemoryOverflow	
Syntax	Std_ReturnType Dem_GetEventMemoryOverflow(uint8 ClientId, Dem_DTCOriginType DTCOrigin, boolean* OverflowIndication)	
Service ID [Hex]	0x32	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	DemClientId identifying the DemEventMemorySet indicating in which event memory the overflow has occurred.
	DTCOrigin	If the Dem supports more than one event memory this parameter is used to select the source memory the overflow indication shall be read from.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed or is not supported
Description	Gets the event memory overflow indication status.	
Preconditions	None	
Configuration	None	
Dependency		
Available via	Dem.h	

6.3.3.16 Dem_GetNumberOfEventMemoryEntries

Function Name	Dem_GetNumberOfEventMemoryEntries
Syntax	Std_ReturnType Dem_GetNumberOfEventMemoryEntries(

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	uint8 ClientId, Dem_DTCOriginType DTCOrigin, uint8* NumberOfEventMemoryEntries)	
Service ID [Hex]	0x35	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	DemClientId identifying the DemEventMemorySet to which the requested event memory belongs to.
	DTCOrigin	If the Dem supports more than one event memory this parameter is used to select the source memory the number of entries shall be read from.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	NumberOfEventMemoryEntries	Number of entries currently stored in the requested event memory.
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed or is not supported
Description	Returns the number of entries currently stored in the requested event memory.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.17 Dem_ResetEventDebounceStatus

Function Name	Dem_ResetEventDebounceStatus	
Syntax	Std_ReturnType Dem_ResetEventDebounceStatus(Dem_EventIdType EventId, Dem_DebounceResetStatusType DebounceResetStatus)	
Service ID [Hex]	0x09	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	DebounceResetStatus	Freeze or reset the internal debounce counter/timer of the specified event.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Only on development error
Description	Control the internal debounce counter/timer by BSW modules and SWCs. The event qualification will not be affected by these debounce	

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	state changes. This API is available for BSW modules as soon as Dem_PreInit has been completed (refer to SWS_Dem_00438 and SWS_Dem_00167).
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.3.18 Dem_ResetEventStatus

Function Name	Dem_ResetEventStatus	
Syntax	Std_ReturnType Dem_ResetEventStatus(Dem_EventIdType EventId)	
Service ID [Hex]	0x05	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	DebounceResetStatus	Freeze or reset the internal debounce counter/timer of the specified event.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Request to reset the event status was successful accepted. E_NOT_OK: Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.
Description	Resets the event failed status. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.19 Dem_RestartOperationCycle

Function Name	Dem_RestartOperationCycle	
Syntax	Std_ReturnType Dem_RestartOperationCycle(uint8 OperationCycleId)	
Service ID [Hex]	0x08	
Sync/Async	Asynchronous	
Reentrancy	Reentrant	
Parameters (In)	OperationCycleId	Identification of operation cycle, like power cycle, driving cycle.
Parameters (Inout)	None	
Parameters (Out)	None	

Return Value	Std_ReturnType	E_OK: set of operation cycle was accepted and will be handled asynchronously E_NOT_OK: set of operation cycle was rejected
Description	Sets an operation cycle state. This API can only be used through the RTE and therefore no declaration is exported via Dem.h. The interface has an asynchronous behavior to avoid exceeding of typical timing requirements on APIs if a large number of events has to be processed and during the re-initializations of the related monitors. The asynchronous acknowledgements are the related InitMonitorForEvent callbacks.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.20 Dem_PrestoreFreezeFrame

Function Name	Dem_PrestoreFreezeFrame	
Syntax	Std_ReturnType Dem_PrestoreFreezeFrame(Dem_EventIdType EventId)	
Service ID [Hex]	0x06	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK Freeze frame prestorage was successful E_NOT_OK Freeze frame prestorage failed
Description	Captures the freeze frame data for a specific event. This API can only be used through the RTE and therefore no declaration is exported via Dem.h. API Availability: This API will be available only if ({ecuc(Dem/DemConfigSet/DemEventParameter.DemFFPrestorage-Supported)} == true)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.21 Dem_SelectDTC

Function Name	Dem_SelectDTC	
Syntax	Std_ReturnType Dem_SelectDTC(uint8 ClientId, uint32 DTC, Dem_DTCFormatType DTCFormat, Dem_DTCOriginType DTCOrigin)	
Service ID [Hex]	0xb7	

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Sync/Async	Synchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	DTC	Defines the DTC in respective format that is selected. If the DTC fits to a DTC group number, the DTC group is selected.
	DTCFormat	Defines the input-format of the provided DTC value.
	DTCOrigin	The event memory of the requested DTC or group of DTC.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK Freeze frame prestorage was successful E_NOT_OK Freeze frame prestorage failed
Description	Captures the freeze frame data for a specific event. This API can only be used through the RTE and therefore no declaration is exported via Dem.h. API Availability: This API will be available only if {ecuc(Dem/DemConfigSet/DemEventParameter.DemFFPrestorage-Supported)} == true	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.22 Dem_SetComponentAvailable

Function Name	Dem_SetComponentAvailable	
Syntax	Std_ReturnType Dem_SetComponentAvailable(Dem_ComponentIdType ComponentId, boolean AvailableStatus)	
Service ID [Hex]	0x2b	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ComponentId	Identification of a DemComponent.
	AvailableStatus	This parameter specifies whether the respective Component shall be available (TRUE) or not (FALSE).
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed
Description	Set the availability of a specific DemComponent.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.23 Dem_SetDTCSuppression

Function Name	Dem_SetDTCSuppression
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Syntax	Std_ReturnType Dem_SetDTCsuppression(uint8 ClientId, boolean SuppressionStatus)	
Service ID [Hex]	0x33	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
	SuppressionStatus	This parameter specifies whether the respective DTC shall be disabled (TRUE) or enabled (FALSE).
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: The status of the DTC is correctly provided in the DTCStatus parameter. E_NOT_OK: No DTC selected. DEM_WRONG_DTC: Selected DTC value in selected format does not exist. DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist.
Description	Set the suppression status of a specific DTC. API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemSuppressionSupport)} == DEM_DTC_SUPPRESSION)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.24 Dem_SetEnableCondition

Function Name	Dem_SetEnableCondition	
Syntax	Std_ReturnType Dem_SetEnableCondition(uint8 EnableConditionID, boolean ConditionFulfilled)	
Service ID [Hex]	0x39	
Sync/Async	Asynchronous	
Reentrancy	Reentrant	
Parameters (In)	EnableConditionID	This parameter identifies the enable condition.
	ConditionFulfilled	This parameter specifies whether the enable condition assigned to the EnableConditionID is fulfilled (TRUE) or not fulfilled (FALSE).
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	In case the enable condition could be set successfully the API call returns E_OK. If the setting of the enable condition failed the return value of the function

	is E_NOT_OK.
Description	Sets an enable condition. API Availability: This API will be available only if ({ecuc(Dem/DemGeneral/DemEnableCondition)}) != NULL)
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.3.25 Dem_SetEventAvailable

Function Name	Dem_SetEventAvailable	
Syntax	Std_ReturnType Dem_SetEventAvailable(Dem_EventIdType EventId, boolean AvailableStatus)	
Service ID [Hex]	0x37	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	AvailableStatus	This parameter specifies whether the respective Event shall be available (TRUE) or not (FALSE).
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Request to set the availability status was successful. E_NOT_OK: Request to set the availability status not accepted.
Description	Set the available status of a specific Event.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.26 Dem_SetEventFailureCycleCounterThreshold

Function Name	Dem_SetEventFailureCycleCounterThreshold	
Syntax	Std_ReturnType Dem_SetEventFailureCycleCounterThreshold(Dem_EventIdType EventId, uint8 FailureCycleCounterThreshold)	
Service ID [Hex]	0x57	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	FailureCycleCounter Threshold	Failure cycle counter threshold of event to be set.
Parameters (Inout)	None	
Parameters (Out)	None	

Return Value	Std_ReturnType	E_OK: Change of threshold was successful. E_NOT_OK: Threshold cannot be changed as DemEventFailureCycleCounterThresholdAdaptable is set to FALSE for this event.
Description	Set the failure confirmation threshold of an event.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.27 Dem_SetEventStatus

Function Name	Dem_SetEventStatus	
Syntax	Std_ReturnType Dem_SetEventStatus(Dem_EventIdType EventId, Dem_EventStatusType EventStatus)	
Service ID [Hex]	0x04	
Sync/Async	Synchronous/Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
	EventStatus	Monitor test result
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: set of event status was successful E_NOT_OK: Event status setting or processing failed or could not be accepted.
Description	Called by SW-Cs or BSW modules to report monitor status information to the Dem. BSW modules calling Dem_SetEventStatus can safely ignore the return value.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.28 Dem_SetEventStatusWithMonitorData

Function Name	Dem_SetEventStatusWithMonitorData	
Syntax	Std_ReturnType Dem_SetEventStatusWithMonitorData(Dem_EventIdType EventId, Dem_EventStatusType EventStatus, Dem_MonitorDataType monitorData0, Dem_MonitorDataType monitorData1)	
Service ID [Hex]	0xbd	
Sync/Async	Synchronous/Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	

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Parameters (In)	EventId	Identification of an event by assigned EventId.
	EventStatus	Monitor test result
	monitorData0	--
	monitorData1	--
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: set of event status was successful E_NOT_OK: Event status setting or processing failed or could not be accepted.
Description	--	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.29 Dem_SetStorageCondition

Function Name	Dem_SetStorageCondition	
Syntax	Std_ReturnType Dem_SetStorageCondition(uint8 StorageConditionID, boolean ConditionFulfilled)	
Service ID [Hex]	0x38	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	StorageConditionID	This parameter identifies the storage condition.
	ConditionFulfilled	This parameter specifies whether the storage condition assigned to the StorageConditionID is fulfilled (TRUE) or not fulfilled (FALSE).
	monitorData0	--
	monitorData1	--
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	In case the storage condition could be set successfully the API call returns E_OK. If the setting of the storage condition failed the return value of the function is E_NOT_OK.
Description	Sets a storage condition. API Availability: This API will be available only if {ecuc(Dem/DemGeneral/DemStorageCondition)} != NULL	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.3.30 Dem_SetWIRStatus

Function Name	Dem_SetWIRStatus
Syntax	Std_ReturnType Dem_SetWIRStatus(

	Dem_EventIdType EventId, boolean WIRStatus)	
Service ID [Hex]	0x7a	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId. The Event Number is configured in the DEM. Min.: 1 (0: Indication of no Event or Failure) Max.: Result of configuration of Event Numbers in DEM (Max is either 255 or 65535)
	WIRStatus	Requested status of event related WIR-bit (regarding to the current status of function inhibition) WIRStatus = TRUE -> WIR-bit shall be set to "1" WIRStatus = FALSE -> WIR-bit shall be set to "0"
	monitorData0	--
	monitorData1	--
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Request to set the WIR status was successful. E_NOT_OK: Request to set the WIR status was not accepted (e.g. disabled controlDTCSetting) and should be repeated.
Description	Sets the WIR status bit via failsafe SW-Cs. This API can only be used through the RTE and therefore no declaration is exported via Dem.h.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4 Interface Dcm <=> Dem

6.3.4.1 Access DTCs and Status Information

6.3.4.1.1 Dem_GetTranslationType

Function Name	Dem_GetTranslationType	
Syntax	Dem_DTCTranslationFormatType Dem_GetTranslationType(uint8 ClientId)	
Service ID [Hex]	0x3c	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Dem_DTCTranslationFormatType	Returns the configured DTC translation format. A combination of different DTC formats is not possible.

Description	Gets the supported DTC formats of the ECU. The supported formats are configured via DemTypeOfDTCSupported.
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.4.1.2 Dem_GetDTCStatusAvailabilityMask

Function Name	Dem_GetDTCStatusAvailabilityMask	
Syntax	Std_ReturnType Dem_GetDTCStatusAvailabilityMask(uint8 ClientId, Dem_UdsStatusByteType* DTCStatusMask)	
Service ID [Hex]	0x16	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTCStatusMask	DTCStatusMask The value DTCStatusMask indicates the supported DTC status bits from the Dem. All supported information is indicated by setting the corresponding status bit to 1. See ISO14229-1.
Return Value	Std_ReturnType	E_OK: get of DTC status mask was successful E_NOT_OK: get of DTC status mask failed
Description	Gets the DTC Status availability mask.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.3 Dem_GetStatusOfDTC

Function Name	Dem_GetDTCStatusAvailabilityMask	
Syntax	Std_ReturnType Dem_GetStatusOfDTC(uint8 ClientId, uint8* DTCStatus)	
Service ID [Hex]	0x15	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIDs, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTCStatus	This parameter receives the status information of

		the requested DTC. It follows the format as defined in ISO14229-1. If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	<p>E_OK: The status of the DTC is correctly provided in the DTCStatus parameter.</p> <p>E_NOT_OK: No DTC selected</p> <p>DEM_WRONG_DTC: Selected DTC value in selected format does not exist</p> <p>DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist</p> <p>DEM_PENDING: Retrieving the DTC status is currently in progress. The caller shall call this function again at a later moment.</p> <p>DEM_NO_SUCH_ELEMENT - Selected DTC does not have an assigned DTC status.</p> <p>DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.</p>
Description	<p>Gets the status of a DTC.</p> <p>For large configurations and DTC-calibration, the interface behavior can be asynchronous (splitting the DTC-search into segments).</p> <p>The DTCs of OBD Events Suppression shall be reported as Dem_WRONG_DTC.</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.4 Dem_GetSeverityOfDTC

Function Name	Dem_GetSeverityOfDTC	
Syntax	Std_ReturnType Dem_GetSeverityOfDTC(uint8 ClientId, Dem_DTCSeverityType* DTCSeverity)	
Service ID [Hex]	0x15	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTCSeverity	This parameter contains the DTCSeverity according to ISO 14229-1.
Return Value	Std_ReturnType	<p>E_OK: The DTC severity is correctly provided in the DTCSeverity parameter.</p> <p>E_NOT_OK: No DTC selected</p> <p>DEM_WRONG_DTC: Selected DTC value in selected</p>

		format does not exist DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist DEM_PENDING: Retrieving the DTC is currently in progress. The caller shall call this function again at a later moment. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Gets the severity of the requested DTC. For large configurations and DTC-calibration, the interface behavior can be asynchronous (splitting the DTC-search into segments).	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.5 Dem_GetFunctionalUnitOfDTC

Function Name	Dem_GetFunctionalUnitOfDTC	
Syntax	Std_ReturnType Dem_GetFunctionalUnitOfDTC(uint8 ClientId, uint8* DTCFunctionalUnit)	
Service ID [Hex]	0x34	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTCFunctionalUnit	Functional unit value of this DTC
Return Value	Std_ReturnType	E_OK: The DTC functional unit is correctly provided in the DTCSeverity parameter. E_NOT_OK: No DTC selected DEM_WRONG_DTC: Selected DTC value in selected format does not exist DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist DEM_PENDING: Retrieving the DTC functional unit is currently in progress. The caller shall call this function again at a later moment. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Gets the functional unit of the requested DTC.	
Preconditions	None	
Configuration Dependency	None	

Available via Dem.h

6.3.4.1.6 Dem_SetDTCFilter

Function Name	Dem_SetDTCFilter	
Syntax	<pre>Std_ReturnType Dem_SetDTCFilter(uint8 ClientId, uint8 DTCStatusMask, Dem_DTCFormatType DTCFormat, Dem_DTCOriginType DTCOrigin, boolean FilterWithSeverity, Dem_DTCSeverityType DTCSeverityMask, boolean FilterForFaultDetectionCounter)</pre>	
Service ID [Hex]	0x13	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
	DTCStatusMask	Status-byte mask for DTC status-byte filtering Values: 0x00: Autosar-specific value to deactivate the status-byte filtering (different meaning than in ISO 14229-1) to report all supported DTCs (used for service 0x19 subfunctions 0x0A/0x15) 0x01..0xFF: Status-byte mask according to ISO 14229-1 DTCStatusMask (handed over by Dcm from service request directly) to filter for DTCs with at least one status bit set matching this status-byte mask
	DTCFormat	Defines the output-format of the requested DTC values for the sub-sequent API calls. If passed value does not fit to Configuration, the DET error DEM_E_WRONG_CONFIGURATION shall be reported, e.g. if DTCFormat "DEM_DTC_FORMAT_OBD" is passed, but OBD is not supported per configuration.
	DTCOrigin	If the Dem supports more than one event memory this parameter is used to select the source memory the DTCs shall be read from. If passed value does not fit to Configuration, the DET error DEM_E_WRONG_CONFIGURATION shall be reported, e.g. if DTCOrigin "DEM_DTC_ORIGIN_MIRROR_MEMORY" is passed, but no mirror memory is configured.
	FilterWithSeverity	This flag defines whether severity information (ref. to parameter below) shall be used for filtering. This is to allow for coexistence of DTCs with and without severity information.

	DTCSeverityMask	Contains the DTCSeverityMask according to ISO14229-1.
	FilterForFaultDetectionCounter	This flag defines whether the fault detection counter information shall be used for filtering. This is to allow for coexistence of DTCs with and without fault detection counter information. If fault detection counter information is filter criteria, only those DTCs with a fault detection counter value between 1 and 0x7E shall be reported. Remark: If the event does not use the debouncing inside Dem, then the Dem must request this information via GetFaultDetectionCounter.
Parameters (Inout)	None	
Parameters (Out)	DTCFunctionalUnit	Functional unit value of this DTC
Return Value	Std_ReturnType	E_NOT_OK: Indicates a wrong DTCOrigin or DTCFormat
Description	<p>Sets the DTC Filter.</p> <p>The server shall perform a bit-wise logical AND-ing operation between the parameter DTCStatusMask and the current UDS status in the server.</p> <p>In addition to the DTCStatusAvailabilityMask, the server shall return all DTCs for which the result of the AND-ing operation is non-zero [i.e. (statusOfDTC & DTCStatusMask) != 0]. The server shall process only the DTC Status bits that it is supporting.</p> <p>OBD Events Suppression shall be ignored for this computation.</p> <p>If no DTCs within the server match the masking criteria specified in the client's request, no DTC or status information shall be provided following the DTCStatusAvailabilityMask byte in the positive response message</p> <p>((statusOfDTC & DTCStatusMask) != 0) && ((severity & DTCSeverityMask) != 0) == TRUE</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.7 Dem_GetNumberOfFilteredDTC

Function Name	Dem_GetNumberOfFilteredDTC	
Syntax	Std_ReturnType Dem_GetNumberOfFilteredDTC(uint8 ClientId, uint16* NumberOfFilteredDTC)	
Service ID [Hex]	0x17	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	

Parameters (Out)	NumberOfFilteredDTC	The number of DTCs matching the defined status mask.
Return Value	Std_ReturnType	E_OK: Getting number of filtered DTCs was successful E_NOT_OK: No DTC filter set DEM_PENDING: The requested operation is currently in progress. The caller shall call this function again at a later moment.
Description	Gets the number of a filtered DTC.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.8 Dem_GetNextFilteredDTC

Function Name	Dem_GetNextFilteredDTC	
Syntax	Std_ReturnType Dem_GetNextFilteredDTC(uint8 ClientId, uint32* DTC, uint8* DTCStatus)	
Service ID [Hex]	0x18	
Sync/Async	Synchronous or Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTC	Receives the DTC value in respective format of the filter returned by this function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCStatus	This parameter receives the status information of the requested DTC. It follows the format as defined in ISO14229-1 If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Returned next filtered element E_NOT_OK: No DTC filter set DEM_NO_SUCH_ELEMENT: No further element matching the filter criteria found DEM_PENDING: The requested operation is currently in progress. The caller shall call this function again at a later moment. Note that according to SWS_Dem_00653 this return value is not always allowed.
Description	Gets the next filtered DTC matching the filter criteria. For UDS services, the interface has an asynchronous behavior, because a large number of	

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	DTCs has to be processed
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.4.1.9 Dem_GetNextFilteredDTCAndFDC

Function Name	Dem_GetNextFilteredDTCAndFDC	
Syntax	Std_ReturnType Dem_GetNextFilteredDTCAndFDC(uint8 ClientId, uint32* DTC, sint8* DTCFaultDetectionCounter)	
Service ID [Hex]	0x3b	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTC	Receives the DTC value in respective format of the filter returned by this function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCFaultDetectionCounter	This parameter receives the Fault Detection Counter information of the requested DTC. If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data. -128dec...127dec PASSED...FAILED according to ISO 14229-1
Return Value	Std_ReturnType	E_OK: Returned next filtered element E_NOT_OK: No DTC filter set DEM_NO_SUCH_ELEMENT: No further element matching the filter criteria found DEM_PENDING: The requested operation is asynchronously processed is currently in progress. The caller shall call this function again at a later moment.
Description	Gets the next filtered DTC and its associated Fault Detection Counter (FDC) matching the filter criteria. The interface has an asynchronous behavior, because a large number of DTCs has to be processed and the FDC might be received asynchronously from a SW-C, too.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.10 Dem_GetNextFilteredDTCAndSeverity

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Function Name	Dem_GetNextFilteredDTCAndSeverity	
Syntax	Std_ReturnType Dem_GetNextFilteredDTCAndSeverity (uint8 ClientId, uint32* DTC, uint8* DTCStatus, Dem_DTCSeverityType* DTCSeverity, uint8* DTCFunctionalUnit)	
Service ID [Hex]	0x3d	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTC	Receives the DTC value in respective format of the filter returned by this function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCStatus	This parameter receives the status information of the requested DTC. It follows the format as defined in ISO14229-1 If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCSeverity	Receives the severity value returned by the function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCFunctionalUnit	Receives the functional unit value returned by the function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Returned next filtered element E_NOT_OK: No DTC filter set DEM_NO_SUCH_ELEMENT: No further element matching the filter criteria found DEM_PENDING: The requested operation is currently in progress. The caller shall call this function again at a later moment.
Description	Gets the next filtered DTC and its associated Severity matching the filter criteria. The interface has an asynchronous behavior, because a large number of DTCs has to be processed.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.11 Dem_SetFreezeFrameRecordFilter

Function Name	Dem_SetFreezeFrameRecordFilter	
Syntax	Std_ReturnType Dem_SetFreezeFrameRecordFilter(uint8 ClientId, Dem_DTCFormatType DTCFormat)	
Service ID [Hex]	0x3f	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTC	Receives the DTC value in respective format of the filter returned by this function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	DTCFormat	Defines the output-format of the requested DTC values
Return Value	Std_ReturnType	Status of the operation to (re-)set a freeze frame record filter. E_OK: Filter is accepted, E_NOT_OK: Wrong filter selected
Description	Sets a freeze frame record filter.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.12 Dem_GetNextFilteredRecord

Function Name	Dem_GetNextFilteredRecord	
Syntax	Std_ReturnType Dem_GetNextFilteredRecord(uint8 ClientId, uint32* DTC, uint8* RecordNumber)	
Service ID [Hex]	0x3a	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	DTC	DTC Receives the DTC value in respective format of the filter returned by this function. If the return value of the function is other than E_OK this parameter does not contain valid data.
	RecordNumber	Freeze frame record number of the reported DTC (relative addressing). If the return value of the function is other than E_OK this parameter does not contain valid data.

Return Value	Std_ReturnType	Status of the operation to retrieve a DTC and its associated snapshot record number from the Dem. E_OK: Returned next filtered element DEM_NO_SUCH_ELEMENT: No further element (matching the filter criteria) found DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. Only used by asynchronous interfaces.
Description	Gets the next freeze frame record number and its associated DTC stored in the event memory. The interface has an asynchronous behavior, because NvRAM access might be required.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.1.13 Dem_GetDTCByOccurrenceTime

Function Name	Dem_GetDTCByOccurrenceTime	
Syntax	Std_ReturnType Dem_GetDTCByOccurrenceTime(uint8 ClientId, Dem_DTCRequestType DTCRequest, uint32* DTC)	
Service ID [Hex]	0x19	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
	DTCRequest	This parameter defines the request type of the DTC.
Parameters (Inout)	None	
Parameters (Out)	DTC	Receives the DTC value in UDS format returned by the function. If the return value of the function is other than DEM_OCCURR_OK this parameter does not contain valid data.
	RecordNumber	E_OK: get of DTC was successful E_NOT_OK: the call was not successful DEM_NO_SUCH_ELEMENT: The requested element is not stored
Return Value	Std_ReturnType	Status of the operation to retrieve a DTC and its associated snapshot record number from the Dem. E_OK: Returned next filtered element DEM_NO_SUCH_ELEMENT: No further element (matching the filter criteria) found DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. Only used by asynchronous interfaces.

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Description	Gets the DTC by occurrence time. There is no explicit parameter for the DTC-origin as the origin always is DEM_DTC_ORIGIN_PRIMARY_MEMORY.
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.4.1.14 Dem_SetDTCFilterByReadinessGroup

Function Name	Dem_SetDTCFilterByReadinessGroup	
Syntax	Std_ReturnType Dem_SetDTCFilterByReadinessGroup (uint8 ClientId, Dem_DTCFormatType DTCFormat, Dem_EventOBDRreadinessGroupType ReadinessGroupNumber)	
Service ID [Hex]	0xC2	
Sync/Async	Synchronous	
Reentrancy	Non-Reentrant	
Parameters (In)	DTCFormat	Defines the output-format of the requested DTC value.
	ReadinessGroupNumber	Defines the DTC readiness number that assign after DTC filter
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Dem_ReturnSetFilterType	
Description	Sets the DTC Filter based on a given DTC readiness group on the primary fault memory. the server selects all DTCs that have this DTC readiness group configured.	
Preconditions	The API Dem_Init() should have been called in sequence	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2 Access extended data records and FreezeFrame data

6.3.4.2.1 Dem_DisableDTCRecordUpdate

Function Name	Dem_DisableDTCRecordUpdate	
Syntax	Std_ReturnType Dem_DisableDTCRecordUpdate(uint8 ClientId)	
Service ID [Hex]	0x1a	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Event memory update successfully disabled E_NOT_OK: No DTC selected DEM_WRONG_DTC: Selected DTC value in selected format does not exist or a group of DTC was selected DEM_WRONG_DTCORIGIN: Selected DTCORIGIN

	does not exist DEM_PENDING: Disabling the DTC record update is currently in progress. The caller shall call this function again at a later moment. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Disables the event memory update of a specific DTC (only one at one time).
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.4.2 Dem_EnableDTCRecordUpdate

Function Name	Dem_EnableDTCRecordUpdate	
Syntax	Std_ReturnType Dem_EnableDTCRecordUpdate(uint8 ClientId)	
Service ID [Hex]	0x1b	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: DTC record successfully updated. E_NOT_OK: No DTC selected. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Enables the event memory update of the DTC disabled by Dem_DisableDTCRecordUpdate() before.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.3 Dem_GetSizeOfExtendedDataRecordSelection

Function Name	Dem_GetSizeOfExtendedDataRecordSelection	
Syntax	Std_ReturnType Dem_GetSizeOfExtendedDataRecordSelection(uint8 ClientId, uint16* SizeOfExtendedDataRecord)	
Service ID [Hex]	0x21	
Sync/Async	Asynchronous	

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Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	SizeOfExtendedDataRecord	Size of the requested extended data record(s) including record number. The format for a single ExtendedDataRecord is: {RecordNumber, data[1], ...,data[N]}
Return Value	Std_ReturnType	E_OK: Size returned successfully E_NOT_OK : selection function is not called. DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. DEM_WRONG_DTC: DTC value not existing DEM_WRONG_DTCORIGIN: Wrong DTC origin DEM_NO_SUCH_ELEMENT: Record number is not supported by configuration and therefore invalid
Description	Gets the size of Extended Data Record by DTC selected by the call of Dem_SelectExtendedDataRecord.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.4 Dem_GetSizeOfFreezeFrameSelection

Function Name	Dem_GetSizeOfFreezeFrameSelection	
Syntax	Std_ReturnType Dem_GetSizeOfFreezeFrameSelection(uint8 ClientId, uint16* SizeOfFreezeFrame)	
Service ID [Hex]	0x1f	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	SizeOfFreezeFrame	Number of bytes in the requested freeze frame record.
Return Value	Std_ReturnType	E_OK: Size returned successfully E_NOT_OK : selection function is not called. DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. DEM_WRONG_DTC: DTC value not existing DEM_WRONG_DTCORIGIN: Wrong DTC origin DEM_NO_SUCH_ELEMENT: Record number is not supported by configuration and therefore invalid
Description	Gets the size of freeze frame data by DTC selected by the call of	

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	Dem_SelectFreezeFrameData.
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.4.2.5 Dem_GetNextExtendedDataRecord

Function Name	Dem_GetNextExtendedDataRecord	
Syntax	Std_ReturnType Dem_GetNextExtendedDataRecord(uint8 ClientId, uint8* DestBuffer, uint16* BufSize)	
Service ID [Hex]	0x20	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the extended data record shall be written to. The format is: {ExtendedDataRecord-Number, data[0], data[1], ..., data[n]}
Return Value	Std_ReturnType	E_OK: Size and buffer successfully returned. E_NOT_OK : selection function is not called. DEM_BUFFER_TOO_SMALL: provided buffer size too small. DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. DEM_WRONG_DTC: DTC value not existing DEM_WRONG_DTCORIGIN: Wrong DTC origin DEM_NO_SUCH_ELEMENT: Found no (further) element matching the filter criteria
Description	Gets extended data record for the DTC selected by Dem_SelectExtendedDataRecord. The function stores the data in the provided DestBuffer.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.6 Dem_GetNextFreezeFrameData

Function Name	Dem_GetNextFreezeFrameData
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Syntax	Std_ReturnType Dem_GetNextFreezeFrameData(uint8 ClientId, uint8* DestBuffer, uint16* BufSize)	
Service ID [Hex]	0x1d	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Parameters (Out)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the freeze frame data record shall be written to. The format is: {RecordNumber, NumOfDIDs, DID[1], data[1], ..., DID[N], data[N]}
Return Value	Std_ReturnType	E_OK: Size and buffer successfully returned. DEM_BUFFER_TOO_SMALL: provided buffer size too small DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later. DEM_WRONG_DTC: DTC value not existing E_NOT_OK : selection function is not called. DEM_WRONG_DTCORIGIN: Wrong DTC origin DEM_NO_SUCH_ELEMENT: Found no (further) element matching the filter criteria
Description	Gets freeze frame data by the DTC selected by Dem_SelectFreezeFrameData. The function stores the data in the provided DestBuffer.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.7 Dem_SelectExtendedDataRecord

Function Name	Dem_SelectExtendedDataRecord	
Syntax	Std_ReturnType Dem_SelectExtendedDataRecord(uint8 ClientId, uint8 ExtendedDataNumber)	
Service ID [Hex]	0xba	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling

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		module.
	ExtendedDataNumber	Identification/Number of requested extended data record. Additionally the values 0xFE and 0xFF are explicitly allowed to request the overall size of all OBD records / all records.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Extended data record successfully selected. DEM_WRONG_DTC: Selected DTC value in selected format does not exist. DEM_WRONG_DTCORIGIN: Selected DTCOrigin does not exist. DEM_PENDING: Selecting the extended data record is currently in progress. The caller shall call this function again at a later moment. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Sets the filter to be used by Dem_GetNextExtendedDataRecord and Dem_GetSizeOfExtendedDataRecordSelection.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.8 Dem_SelectFreezeFrameData

Function Name	Dem_SelectExtendedDataRecord	
Syntax	Std_ReturnType Dem_SelectFreezeFrameData(uint8 ClientId, uint8 RecordNumber)	
Service ID [Hex]	0xb9	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
	RecordNumber	Unique identifier for a snapshot record as defined in ISO 14229-1. The value 0xFF is a placeholder referencing all snapshot records of the addressed DTC. The value 0x00 indicates the DTC-specific WWHOBD snapshot record.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Freeze frame data successfully selected. DEM_WRONG_DTC: Selected DTC value in selected format does not exist. DEM_WRONG_DTCORIGIN: Selected DTCOrigin

		does not exist. DEM_PENDING: Selecting the freeze frame is currently in progress. The caller shall call this function again at a later moment. DEM_BUSY: A different Dem_SelectDTC dependent operation according to SWS_Dem_01253 of this client is currently in progress.
Description	Sets the filter to be used by Dem_GetNextFreezeFrameData and Dem_GetSizeOfFreezeFrameSelection.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.9 Dem_GetNumberOfFreezeFrameRecords

Function Name	Dem_GetNumberOfFreezeFrameRecords	
Syntax	Std_ReturnType Dem_GetNumberOfFreezeFrameRecords(uint8 ClientId, uint16* NumberOfFilteredRecords)	
Service ID [Hex]	0x5a	
Sync/Async	Asynchronous	
Reentrancy	Reentrant Reentrant for different ClientIds, non reentrant for the same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	NumberOfFilteredRecords	Number of all freeze frame records currently stored in the primary event memory
Return Value	Std_ReturnType	Status of the operation E_OK: Returned correctly the number of freeze frame records DEM_PENDING: The requested value is calculated asynchronously and currently not available. The caller can retry later
Description	This function returns the number of all freeze frame records currently stored in the primary event memory	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.2.10 Dem_SetDTCFilterByExtendedDataRecordNumber

Function Name	Dem_SetDTCFilterByExtendedDataRecordNumber	
Syntax	Std_ReturnType Dem_SetStorageCondition(uint8 ClientId, Dem_DTCFormatType DTCFormat, uint8 ExtendedDataRecordnumber)	

Service ID [Hex]	0xC1	
Sync/Async	Synchronous	
Reentrancy	Non-Reentrant	
Parameters (In)	DTCFormat	Defines the output-format of the requested DTC value.
	ExtendedDataRecordnumber	This configuration parameter specifies a unique identifier for an extended data record. One or more extended data records can be assigned to one diagnostic event/DTC.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Dem_ReturnSetFilterType	
Description	Sets the DTC Filter based on a given Extended Data Record group on the primary fault memory. the server selects all DTCs that have a matching extended data record.	
Preconditions	The API Dem_Init() should have been called in sequence	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.3 DTC storage

6.3.4.3.1 Dem_DisableDTCSetting

Function Name	Dem_DisableDTCSetting	
Syntax	Std_ReturnType Dem_DisableDTCSetting(uint8 ClientId)	
Service ID [Hex]	0x24	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Returned next filtered element DEM_PENDING: The requested operation is currently in progress. The caller shall call this function again at a later moment.
Description	Disables the DTC setting for all DTCs assigned to the DemEventMemorySet of the addressed client.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.4.3.2 Dem_EnableDTCSetting

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Function Name	Dem_EnabledDTCSetting	
Syntax	Std_ReturnType Dem_EnabledDTCSetting(uint8 ClientId)	
Service ID [Hex]	0x25	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: The operation was successful; DEM_PENDING: The started operation is currently in progress. The caller shall call this function again at a later moment.
Description	(Re)-Enables the DTC setting for all DTCs assigned to the DemEvent-MemorySet of the addressed client.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.5 OBD-specific Dcm <=> Dem Interfaces

6.3.5.1 Dem_DcmGetInfoTypeValue08

Function Name	Dem_DcmGetInfoTypeValue08	
Syntax	Std_ReturnType Dem_DcmGetInfoTypeValue08(Dcm_OpStatusType OpStatus, uint8* lumprdata08, uint8* lumprdata08BufferSize)	
Service ID [Hex]	0x6b	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	OpStatus	Only DCM_INITIAL will appear, because this API behaves synchronous.
Parameters (Inout)	lumprdata08Buffer Size	The maximum number of data bytes that can be written to the lumprdata08 Buffer.
Parameters (Out)	lumprdata08	Buffer containing the number of data elements (as defined in ISO-15031-5) and contents of InfoType \$08. The buffer is provided by the Dcm.
Return Value	Std_ReturnType	Always E_OK is returned.
Description	Service is used for requesting IUMPR data according to Info-Type \$08. This interface is derived from the prototype <Module>_GetInfotypeValueData() defined by the Dcm. Therefore Dcm_OpStatusType and Std_ReturnType are contained. API is needed in OBD-relevant ECUs only.	

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	API Availability: This API will be available only if ({ecuc(Dem/Dem-General.DemOBDSupport)}) != DEM_OBD_NO_OBD_SUPPORT)
Preconditions	None
Configuration Dependency	None
Available via	Dem_Dcm.h

6.3.5.2 Dem_DcmGetInfoTypeValue0B

Function Name	Dem_DcmGetInfoTypeValue0B	
Syntax	Std_ReturnType Dem_DcmGetInfoTypeValue0B(Dcm_OpStatusType OpStatus, uint8* lumprdata0B, uint8* lumprdata0BBufferSize)	
Service ID [Hex]	0x6c	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	OpStatus	Only DCM_INITIAL will appear, because this API behaves synchronous.
Parameters (Inout)	lumprdata0BBufferSize	The maximum number of data bytes that can be written to the lumprdata0B Buffer.
Parameters (Out)	lumprdata0B	Buffer containing the number of data elements (as defined in ISO-15031-5) and contents of InfoType \$0B. The buffer is provided by the Dcm.
Return Value	Std_ReturnType	Always E_OK is returned.
Description	Service is used for requesting IUMPR data according to Info-Type \$0B. This interface is derived from the prototype <Module>_GetInfoTypeValueData() defined by the Dcm. Therefore Dcm_OpStatusType and Std_ReturnType are contained. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if ({ecuc(Dem/Dem-General.DemOBDSupport)}) != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.3 Dem_DcmReadDataOfPID01

Function Name	Dem_DcmReadDataOfPID01	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID01(uint8* PID01value)	
Service ID [Hex]	0x61	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	

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Parameters (Inout)	None	
Parameters (Out)	PID01value	Buffer containing the contents of PID \$01 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$01 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.4 Dem_DcmReadDataOfPID1C

Function Name	Dem_DcmReadDataOfPID1C	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID1C(uint8* PID1Cvalue)	
Service ID [Hex]	0x63	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID1Cvalue	Buffer containing the contents of PID \$1C computed by the Dem. The value of PID\$1C is configuration within DemOBDSupport. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$1C computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} !=DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.5 Dem_DcmReadDataOfPID21

Function Name	Dem_DcmReadDataOfPID21	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID21(uint8* PID21value)	
Service ID [Hex]	0x64	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID21value	Buffer containing the contents of PID \$21 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$21 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.6 Dem_DcmReadDataOfPID30

Function Name	Dem_DcmReadDataOfPID30	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID30(uint8* PID30value)	
Service ID [Hex]	0x65	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID30value	Buffer containing the contents of PID \$30 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.

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Description	Service to report the value of PID \$30 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)
Preconditions	None
Configuration Dependency	None
Available via	Dem_Dcm.h

6.3.5.7 Dem_DcmReadDataOfPID31

Function Name	Dem_DcmReadDataOfPID31	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID31(uint8* PID31value)	
Service ID [Hex]	0x66	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID31value	Buffer containing the contents of PID \$31 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$31 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} == DEM_OBD_MASTER_ECU)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.8 Dem_DcmReadDataOfPID41

Function Name	Dem_DcmReadDataOfPID41	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID41(uint8* PID41value)	
Service ID [Hex]	0x67	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	

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Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID41value	Buffer containing the contents of PID \$41 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$41 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_MASTER_ECU	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.9 Dem_DcmReadDataOfPID4D

Function Name	Dem_DcmReadDataOfPID4D	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID4D(uint8* PID4Dvalue)	
Service ID [Hex]	0x68	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID41value	Buffer containing the contents of PID \$4D computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$4D computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} == DEM_OBD_MASTER_ECU	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.10 Dem_DcmReadDataOfPID4E

Function Name	Dem_DcmReadDataOfPID4E	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID4E(uint8* PID4Evalue)	
Service ID [Hex]	0x69	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID4Evalue	Buffer containing the contents of PID \$4E computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$4E computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {(ecuc(Dem/DemGeneral.DemOBDSupport)) == DEM_OBD_MASTER_ECU}	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.11 Dem_DcmReadDataOfPID91

Function Name	Dem_DcmReadDataOfPID91	
Syntax	Std_ReturnType Dem_DcmReadDataOfPID91(uint8* PID91value)	
Service ID [Hex]	0x6a	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters (Inout)	None	
Parameters (Out)	PID91value	Buffer containing the contents of PID \$91 computed by the Dem. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.

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Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of PID \$91 computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.12 Dem_DcmReadDataOfPID4E

Function Name	Dem_DcmReadDataOfOBDFreezeFrame	
Syntax	Std_ReturnType Dem_DcmReadDataOfOBDFreezeFrame(uint8 PID, uint8 DataElementIndexOfPID, uint8* DestBuffer, uint16* BufSize)	
Service ID [Hex]	0x52	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PID	This parameter is an identifier for a PID as defined in ISO15031-5.
	DataElementIndex	Data element index of this PID according to the Dcm configuration of service \$02. It is zero-based and consecutive, and ordered by the data element positions (configured in Dcm, refer to SWS_Dem_00597).
Parameters (Inout)	None	
Parameters (Out)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the data element of the PID shall be written to. The format is raw hexadecimal values and contains no header-information.
	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in this parameter.
Return Value	Std_ReturnType	E_OK Freeze frame data was successfully reported E_NOT_OK Freeze frame data was not successfully reported
Description	Gets data element per PID and index of the most important freeze frame being selected for the output of service \$02. The function stores the data in the provided DestBuffer. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if	

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	{{ecuc(Dem/DemGeneral.DemOBDSupport)}} != DEM_OBD_NO_OBD_SUPPORT)
Preconditions	None
Configuration Dependency	None
Available via	Dem_Dcm.h

6.3.5.13 Dem_DcmGetDTCOfOBDFreezeFrame

Function Name	Dem_DcmGetDTCOfOBDFreezeFrame	
Syntax	Std_ReturnType Dem_DcmGetDTCOfOBDFreezeFrame(uint8 FrameNumber, uint32* DTC, Dem_DTCFormatType DTCFormat)	
Service ID [Hex]	0x53	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	FrameNumber	Unique identifier for a freeze frame record as defined in ISO 15031-5. The value 0x00 indicates the complete OBD freeze frame. Other values are reserved for future functionality.
	DTCFormat	Output format of the DTC value.
Parameters (Inout)	None	
Parameters (Out)	DTC	Diagnostic Trouble Code in ODB format. If the return value of the function is other than E_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: operation was successful E_NOT_OK: no DTC available
Description	Gets DTC by freeze frame record number. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {{ecuc(Dem/DemGeneral.DemOBDSupport)}} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.14 Dem_DcmGetAvailableOBDMIDs

Function Name	Dem_DcmGetAvailableOBDMIDs	
Syntax	Std_ReturnType Dem_DcmGetAvailableOBDMIDs(uint8 Obdmid, uint32* Obdmidvalue	

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)	
Service ID [Hex]	0x53	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	Obdmid	Availability OBDMID (\$00,\$20, \$40...)
Parameters (Inout)	None	
Parameters (Out)	Obdmidvalue	Bit coded information on the support of OBDMIDs.
Return Value	Std_ReturnType	E_OK: Report of DTR result successful
Description	<p>Reports the value of a requested "availability-OBDMID" to the DCM upon a Service \$06 request. Derived from that the tester displays the supported tests a mechanic can select from. API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if ({ecuc(Dem/Dem-General.DemOBDSupport)}) != DEM_OBD_NO_OBD_SUPPORT)</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.15 Dem_DcmGetNumTIDsOfOBDMID

Function Name	Dem_DcmGetNumTIDsOfOBDMID	
Syntax	<pre>Std_ReturnType Dem_DcmGetNumTIDsOfOBDMID(uint8 Obdmid, uint8* numberOfTIDs)</pre>	
Service ID [Hex]	0xa4	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	Obdmid	OBDMID subject of the request to identify the number of assigned TIDs
Parameters (Inout)	None	
Parameters (Out)	numberOfTIDs	Number of assigned TIDs for the requested OBDMID. Used as loop value for the DCM to retrieve all OBD/TID result data.
Return Value	Std_ReturnType	E_OK: get number of TIDs successful E_NOT_OK: get number of TIDs failed
Description	<p>Gets the number of TIDs per (functional) OBDMID. This can be used by the DCM to iteratively request for OBD/TID result data within a loop from 0....numberOfTIDs-1 API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if ({ecuc(Dem/Dem-General.DemOBDSupport)}) != DEM_OBD_NO_OBD_SUPPORT)</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.16 Dem_DcmGetDTRData

Function Name	Dem_DcmGetDTRData	
Syntax	Std_ReturnType Dem_DcmGetDTRData(uint8 Obdmid, uint8 TIDindex, uint8* TIDvalue, uint8* UaSID, uint16* Testvalue, uint16* Lowlimvalue, uint16* Upplimvalue)	
Service ID [Hex]	0xa5	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	Obdmid	Identification of a DTR element by assigned DTRId.
	TIDindex	Index of the TID within the DEM. Runs from 0 to "numberOfTIDs" obtained in the call to Dem_DcmGetNumTIDsOfOBDMID()
Parameters (Inout)	None	
Parameters (Out)	numberOfTIDs	Identification of a DTR element by assigned DTRId.
Return Value	Std_ReturnType	E_OK: get number of TIDs successful
		E_NOT_OK: get number of TIDs failed
Description	<p>Gets the number of TIDs per (functional) OBDMID. This can be used by the DCM to iteratively request for OBD/TID result data within a loop from 0....numberOfTIDs-1</p> <p>API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if ({ecuc(Dem/Dem-General.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.5.17 Dem_DcmGetInfoTypeValue79

Function Name	Dem_DcmGetInfoTypeValue79	
Syntax	Std_ReturnType Dem_DcmGetInfoTypeValue79 (VAR(Dcm_OpStatusType, AUTOMATIC) OpStatus, P2VAR (uint8, AUTOMATIC, DEM_APPL_DATA) DataValueBuffer, P2VAR (uint8, AUTOMATIC, DEM_APPL_DATA) DataValueBufferSize)	
Service ID [Hex]	0xc3	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	OpStatus	Only DCM_INITIAL will appear, because this API behaves synchronous.

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	DataValueBufferSize	The maximum number of data bytes that can be written to the DataValueBuffer. When the function returns, the value is updated with the actual number of data bytes that are written to the DataValueBuffer.
	DataValueBuffer	Buffer containing the contents of the monitor activity denominator. The buffer is provided by the caller with the appropriate size.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Always E_OK is returned.
Description	Service to report the value of monitor activity denominator PID computed by the Dem. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if:({ecucDem/DemGeneral.DemOBDSupport})!=DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_Dcm.h	

6.3.6 Interface J1939Dcm <=> Dem

6.3.6.1 Access DTCs and Status Information

6.3.6.1.1 Dem_J1939DcmSetDTCFilter

Function Name	Dem_J1939DcmSetDTCFilter	
Syntax	Std_ReturnType Dem_J1939DcmSetDTCFilter(Dem_J1939DcmDTCStatusFilterType DTCStatusFilter, Dem_DTCKindType DTCKind, Dem_DTCOriginType DTCOrigin, uint8 ClientId, Dem_J1939DcmLampStatusType* LampStatus)	
Service ID [Hex]	0x90	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	DTCStatusFilter	The following types are available: DEM_J1939DTC_ACTIVE DEM_J1939DTC_PREVIOUSLY_ACTIVE DEM_J1939DTC_PENDING DEM_J1939DTC_PERMANENT DEM_J1939DTC_CURRENTLY_ACTIVE
	DTCKind	Defines the functional group of DTCs to be reported (e.g. all DTC, OBD-relevant DTC)
	DTCOrigin	This parameter is used to select the source memory the DTCs shall be read/cleared from.

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	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	LampStatus	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Return Value	Std_ReturnType	E_OK: Operation successful E_NOT_OK: Filter could not be set
Description	The function sets the DTC filter for a specific node and returns the composite lamp status of the filtered DTCs.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.1.2 Dem_J1939DcmGetNumberOfFilteredDTC

Function Name	Dem_J1939DcmGetNumberOfFilteredDTC	
Syntax	Std_ReturnType Dem_J1939DcmGetNumberOfFilteredDTC(uint16* NumberOfFilteredDTC, uint8 ClientId)	
Service ID [Hex]	0x91	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	NumberOfFilteredDTC	The number of DTCs matching the defined status mask.
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	Gets the number of currently filtered DTCs set by the function Dem_J1939DcmSetDTCFilter.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.1.3 Dem_J1939DcmGetNextFilteredDTC

Function Name	Dem_J1939DcmGetNextFilteredDTC
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Syntax	Std_ReturnType Dem_J1939DcmGetNextFilteredDTC(uint32* J1939DTC, uint8* OccurrenceCounter, uint8 ClientId)	
Service ID [Hex]	0x92	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	J1939DTC	Receives the J1939DTC value. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	OccurrenceCounter	This parameter receives the corresponding occurrence counter. If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	Gets the next filtered J1939 DTC.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.1.4 Dem_J1939DcmFirstDTCwithLampStatus

Function Name	Dem_J1939DcmFirstDTCwithLampStatus	
Syntax	void Dem_J1939DcmFirstDTCwithLampStatus(uint8 ClientId)	
Service ID [Hex]	0x93	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending.

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	DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	The function sets the filter to the first applicable DTC for the DM31 response for a specific node.
Preconditions	None
Configuration Dependency	None
Available via	Dem_J1939Dcm.h

6.3.6.1.5 Dem_J1939DcmGetNextDTCwithLampStatus

Function Name	Dem_J1939DcmGetNextDTCwithLampStatus	
Syntax	Std_ReturnType Dem_J1939DcmGetNextDTCwithLampStatus(Dem_J1939DcmLampStatusType* LampStatus, uint32* J1939DTC, uint8* OccurenceCounter, uint8 ClientId)	
Service ID [Hex]	0x94	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	LampStatus	Receives the lamp status returned by this function. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	J1939DTC	Receives the J1939DTC value. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	OccurenceCounter	This parameter receives the corresponding occurrence counter. If the return value of the function call is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	Gets the next filtered J1939 DTC for DM31 including current LampStatus.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.2 DTC storage

6.3.6.2.1 Dem_J1939DcmClearDTC

Function Name	Dem_J1939DcmClearDTC	
Syntax	Std_ReturnType Dem_J1939DcmClearDTC(Dem_J1939DcmSetClearFilterType DTCTypeFilter, Dem_DTCTOriginType DTCTOrigin, uint8 ClientId)	
Service ID [Hex]	0x95	
Sync/Async	Asynchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	DTCTypeFilter	ClientId to address the J1939 event memory
	DTCTOrigin	This parameter is used to select the source memory the DTCs shall be read/cleared from.
	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	<p>E_OK: DTC successfully cleared</p> <p>DEM_WRONG_DTC: Selected DTC value in selected format does not exist or clearing is restricted by configuration to group of all DTCs only.</p> <p>DEM_WRONG_DTCORIGIN: Selected DTCTOrigin does not exist</p> <p>DEM_CLEAR_FAILED: DTC clearing failed</p> <p>DEM_CLEAR_BUSY: Another client is currently clearing DTCs. The requested operation will not be started and the caller shall try again at a later moment.</p> <p>DEM_CLEAR_MEMORY_ERROR: An error occurred during erasing a memory location (e.g. if DemClearDTCBehavior is set to DEM_CLRRESP_NON-VOLATILE_FINISH and erasing of non-volatile-block failed).</p> <p>DEM_PENDING: Clearing the DTCs is currently in progress. The caller shall call this function again at a later moment.</p>
Description	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).	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.2.2 Dem_J1939DcmSetFreezeFrameFilter

Function Name	Dem_J1939DcmSetFreezeFrameFilter	
Syntax	Std_ReturnType Dem_J1939DcmSetFreezeFrameFilter(Dem_J1939DcmSetFreezeFrameFilterType FreezeFrameKind,	

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	uint8 ClientId)	
Service ID [Hex]	0x96	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	FreezeFrameKind	The following types are available: DEM_J1939DCM_FREEZEFRAME DEM_J1939DCM_EXPANDED_FREEZEFRAME DEM_J1939DCM_SPNS_IN_EXPANDED_FREEZEFRAME
	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Operation successful E_NOT_OK: Filter could not be set
Description	The function sets the FreezeFrame filter for a specific node.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.2.3 Dem_J1939DcmGetNextFreezeFrame

Function Name	Dem_J1939DcmGetNextFreezeFrame	
Syntax	Std_ReturnType Dem_J1939DcmGetNextFreezeFrame(uint32* J1939DTC, uint8* OccurenceCounter, uint8* DestBuffer, uint16* BufSize, uint8 ClientId)	
Service ID [Hex]	0x97	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	DestBuffer	This parameter contains a byte pointer that points to the buffer, to which the freeze frame data record shall be written to.
	BufSize	When the function is called this parameter contains the maximum number of data bytes that can be written to the buffer. The function returns the actual number of written data bytes in DestBuffer
Parameters (Out)	J1939DTC	Receives the J1939DTC value. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	OccurenceCounter	This parameter receives the corresponding occurrence counter. If the return value of the function call

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		is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	Gets next freeze frame data. The function stores the data in the provided DestBuffer.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.2.4 Dem_J1939DcmGetNextFreezeFrame

Function Name	Dem_J1939DcmGetNextSPNInFreezeFrame	
Syntax	Std_ReturnType Dem_J1939DcmGetNextSPNInFreezeFrame (uint32* SPNSupported, uint8* SPNDataLength, uint8 ClientId)	
Service ID [Hex]	0x98	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	SPNSupported	This parameter contains the next SPN in the ExpandedFreezeFrame
	SPNDataLength	This parameter contains the corresponding dataLength of the SPN
Return Value	Std_ReturnType	E_OK: Operation successful DEM_NO_SUCH_ELEMENT: The requested element is not available DEM_PENDING: Operation successful and result pending. DEM_BUFFER_TOO_SMALL: The provided buffer is too small
Description	Gets next SPN.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.3 Reporting

6.3.6.3.1 Dem_J1939DcmSetRatioFilter

Function Name	Dem_J1939DcmSetRatioFilter	
Syntax	Std_ReturnType Dem_J1939DcmSetRatioFilter(uint16* IgnitionCycleCounter, uint16* OBDMonitoringConditionsEncountered, uint8 ClientId)	
Service ID [Hex]	0x99	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	IgnitionCycleCounter	Ignition Cycle Counter
	OBDMonitoringConditionsEncountered	OBDMonitoring Conditions Encountered
Return Value	Std_ReturnType	E_OK: Operation successful
		E_NOT_OK: Filter could not be set
Description	The function sets the Ratio filter for a specific node and returns the corresponding Ignition Cycle Counter and General Denominator.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.3.2 Dem_J1939DcmSetRatioFilter

Function Name	Dem_J1939DcmGetNextFilteredRatio	
Syntax	Std_ReturnType Dem_J1939DcmGetNextFilteredRatio(uint32* SPN, uint16* Numerator, uint16* Denominator, uint8 ClientId)	
Service ID [Hex]	0x9a	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	SPN	Receives the SPN of the applicable system monitor. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
	Numerator	Receives the Numerator of the applicable system monitor. If the return value of the function is other

		than DEM_FILTERED_OK this parameter does not contain valid data.
	Denominator	Receives the Denominator of the applicable system monitor. If the return value of the function is other than DEM_FILTERED_OK this parameter does not contain valid data.
Return Value	Std_ReturnType	E_OK: Operation successful E_NOT_OK: Filter could not be set
Description	The function sets the Ratio filter for a specific node and returns the corresponding Ignition Cycle Counter and General Denominator.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.3.3 Dem_J1939DcmReadDiagnosticReadiness1

Function Name	Dem_J1939DcmReadDiagnosticReadiness1	
Syntax	Std_ReturnType Dem_J1939DcmReadDiagnosticReadiness1(Dem_J1939DcmDiagnosticReadiness1Type* DataValue, uint8 ClientId)	
Service ID [Hex]	0x9b	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	ClientId to address the J1939 event memory
Parameters (Inout)	None	
Parameters (Out)	DataValue	Buffer of 8 bytes containing the contents of Diagnostic Readiness 1 (DM05) computed by the Dem.
Return Value	Std_ReturnType	E_OK: Operation was successful E_NOT_OK: Operation failed
Description	Service to report the value of Diagnostic Readiness 1 (DM05) computed by the Dem.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem_J1939Dcm.h	

6.3.6.3.4 Dem_J1939DcmReadDiagnosticReadiness2

Function Name	Dem_J1939DcmReadDiagnosticReadiness2	
Syntax	Std_ReturnType Dem_J1939DcmReadDiagnosticReadiness2(Dem_J1939DcmDiagnosticReadiness2Type* DataValue,	

	uint8 ClientId)
Service ID [Hex]	0x9c
Sync/Async	Synchronous
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.
Parameters (In)	ClientId ClientId to address the J1939 event memory
Parameters (Inout)	None
Parameters (Out)	DataValue Buffer of 8 bytes containing the contents of Diagnostic Readiness 2 (DM21) computed by the Dem.
Return Value	Std_ReturnType E_OK: Operation was successful E_NOT_OK: Operation failed
Description	Service to report the value of Diagnostic Readiness 2 (DM21) computed by the Dem.
Preconditions	None
Configuration Dependency	None
Available via	Dem_J1939Dcm.h

6.3.6.3.5 Dem_J1939DcmReadDiagnosticReadiness3

Function Name	Dem_J1939DcmReadDiagnosticReadiness3
Syntax	Std_ReturnType Dem_J1939DcmReadDiagnosticReadiness3(Dem_J1939DcmDiagnosticReadiness3Type* DataValue, uint8 ClientId)
Service ID [Hex]	0x9d
Sync/Async	Synchronous
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.
Parameters (In)	ClientId ClientId to address the J1939 event memory
Parameters (Inout)	None
Parameters (Out)	DataValue Buffer of 8 bytes containing the contents of Diagnostic Readiness 3 (DM26) computed by the Dem.
Return Value	Std_ReturnType E_OK: Operation was successful E_NOT_OK: Operation failed
Description	Service to report the value of Diagnostic Readiness 3 (DM26) computed by the Dem.
Preconditions	None
Configuration Dependency	None
Available via	Dem_J1939Dcm.h

6.3.7 OBD-specific Interfaces

6.3.7.1 Dem_SetEventDisabled

Function Name	Dem_SetEventDisabled
Syntax	Std_ReturnType Dem_SetEventDisabled(Dem_EventIdType EventId

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)	
Service ID [Hex]	0x51	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different EventIds. Non reentrant for the same EventId.	
Parameters (In)	EventId	Identification of an event by assigned EventId.
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK set of event to disabled was successfull. E_NOT_OK set of event disabled failed
Description	Service for reporting the event as disabled to the Dem for the PID \$41 computation. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.2 Dem_ReplUMPRFaultDetect

Function Name	Dem_ReplUMPRFaultDetect	
Syntax	Std_ReturnType Dem_ReplUMPRFaultDetect(Dem_RatioIdType RatioID)	
Service ID [Hex]	0x73	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different RatioIDs. Non reentrant for the same RatioID.	
Parameters (In)	RatioID	Ratio Identifier reporting that a respective monitor could have found a fault - only used when interface option "API" is selected
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK report of IUMPR result was successfully reported
Description	Service for reporting that faults are possibly found because all conditions are fulfilled. API is needed in OBD-relevant ECUs only API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.3 Dem_SetIUMPRDenCondition

Function Name	Dem_SetIUMPRDenCondition	
Syntax	Std_ReturnType Dem_SetIUMPRDenCondition(Dem_lumprDenomCondIdType ConditionId, Dem_lumprDenomCondStatusType ConditionStatus)	
Service ID [Hex]	0xae	
Sync/Async	Synchronous /Asynchronous	
Reentrancy	Reentrant	
Parameters (In)	RatioID	Identification of a IUMPR denominator condition ID (General Denominator, Cold start, EVAP, 500mi).
	ConditionStatus	Status of the IUMPR denominator condition (Notreached, reached, not reachable / inhibited)
Parameters (Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: set of IUMPR denominator condition was successful E_NOT_OK: set of IUMPR denominator condition failed or could not be accepted.
Description	In order to communicate the status of the (additional) denominator conditions among the OBD relevant ECUs, the API is used to forward the condition status to a Dem of a particular ECU. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.4 Dem_GetIUMPRDenCondition

Function Name	Dem_GetIUMPRDenCondition	
Syntax	Std_ReturnType Dem_GetIUMPRDenCondition(Dem_lumprDenomCondIdType ConditionId, Dem_lumprDenomCondStatusType* ConditionStatus)	
Service ID [Hex]	0xaf	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	ConditionId	Identification of a IUMPR denominator condition ID (General Denominator, Cold start, EVAP, 500mi).

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Parameters (Inout)	None	
Parameters (Out)	ConditionStatus	Status of the IUMPR denominator condition (Notreached, reached, not reachable / inhibited)
Return Value	Std_ReturnType	E_OK: set of IUMPR denominator condition was successful E_NOT_OK: set of IUMPR denominator condition failed or could not be accepted.
Description	In order to communicate the status of the (additional) denominator conditions among the OBD relevant ECUs, the API is used to retrieve the condition status from the Dem of the ECU where the conditions are computed. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.5 Dem_ReplUMPRDenRelease

Function Name	Dem_ReplUMPRDenRelease	
Syntax	Std_ReturnType Dem_ReplUMPRDenRelease(Dem_RatioIDType RatioID)	
Service ID [Hex]	0x72	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	RatioID	Ratio Identifier reporting that specific denominator is released (for physical reasons - e.g. temperature conditions or minimum activity)
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK report of IUMPR denominator status was successfully reported E_NOK report of IUMPR denominator status was not successfully reported
Description	Service is used to release a denominator of a specific monitor. API is needed in OBD-relevant ECUs only API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.6 Dem_SetPtoStatus

Function Name	Dem_SetPtoStatus	
Syntax	Std_ReturnType Dem_SetPtoStatus(boolean PtoStatus)	
Service ID [Hex]	0x79	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PtoStatus	sets the status of the PTO (TRUE==active; FALSE==inactive)
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Returns E_OK when the new PTO-status has been adopted by the Dem; returns E_NOT_OK in all other cases.
Description	API is needed in OBD-relevant ECUs only API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.7 Dem_ReadDataOfPID01

Function Name	Dem_ReadDataOfPID01	
Syntax	Std_ReturnType Dem_ReadDataOfPID01(uint8* PID01value)	
Service ID [Hex]	0xb3	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters(Inout)	None	
Parameters (Out)	PID01value	Buffer containing the contents of PID \$01 computed by the Dem. The buffer is provided by the application with the size of 4 bytes.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	Service to report the value of PID \$01 computed by the Dem. API is needed in OBD relevant ECUs only	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.8 Dem_GetDataOfPID21

Function Name	Dem_GetDataOfPID21	
Syntax	Std_ReturnType Dem_GetDataOfPID21(uint8* PID21value)	
Service ID [Hex]	0xb1	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters(Inout)	None	
Parameters (Out)	PID21value	Content of PID \$21 as raw hex value.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	<p>Service to get the value of PID \$21 from the Dem by a software component. API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if ({ecuc(Dem/Dem-General/DemGeneralOBD.DemOBDCentralizedPID21Handling)} == true) && ({ecuc(Dem/DemGeneral.DemOBDSupport)} == DEM_OBD_MASTER_ECU)</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.9 Dem_SetDataOfPID21

Function Name	Dem_SetDataOfPID21	
Syntax	Std_ReturnType Dem_SetDataOfPID21(const uint8* PID21value)	
Service ID [Hex]	0xa6	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PID21value	<p>Buffer containing the contents of PID \$21.</p> <p>The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.</p>
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	<p>Service to set the value of PID \$21 in the Dem by a software component. API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)</p>	
Preconditions	None	
Configuration Dependency	None	

Available via Dem.h

6.3.7.10 Dem_SetDataOfPID31

Function Name	Dem_SetDataOfPID31	
Syntax	Std_ReturnType Dem_SetDataOfPID31(const uint8* PID31value)	
Service ID [Hex]	0xa7	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PID31value	Buffer containing the contents of PID \$31. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	Service to set the value of PID \$31 in the Dem by a software component. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.11 Dem_SetDataOfPID4D

Function Name	Dem_SetDataOfPID31	
Syntax	Std_ReturnType Dem_SetDataOfPID4D(const uint8* PID4Dvalue)	
Service ID [Hex]	0xa8	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PID4Dvalue	Buffer containing the contents of PID \$4D. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	Service to set the value of PID \$4D in the Dem by a software component. API is needed in OBD-relevant ECUs only.	

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	API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)
Preconditions	None
Configuration Dependency	None
Available via	Dem.h

6.3.7.12 Dem_SetDataOfPID4E

Function Name	Dem_SetDataOfPID4E	
Syntax	Std_ReturnType Dem_SetDataOfPID4E(const uint8* PID4Evalue)	
Service ID [Hex]	0xa9	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	PID4Dvalue	Buffer containing the contents of PID \$4D. The buffer is provided by the Dcm with the appropriate size, i.e. during configuration, the Dcm identifies the required size from the largest PID in order to configure a PIDBuffer.
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear
Description	Service to set the value of PID \$4D in the Dem by a software component. API is needed in OBD-relevant ECUs only. API Availability: This API will be available only if ({ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT)	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.13 Dem_GetCycleQualified

Function Name	Dem_GetCycleQualified	
Syntax	Std_ReturnType Dem_GetCycleQualified(uint8 OperationCycleId, boolean* isQualified)	
Service ID [Hex]	0xab	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	OperationCycleId	Identification of a configured DemOperationCycle.
Parameters(Inout)	None	
Parameters (Out)	isQualified	TRUE: The dependent operation cycle is qualified. FALSE: The qualification conditions of the dependent

		operation cycle have not been met.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Returns the qualification state of the dependent operation cycle. API Availability: This API will be available only if any of the {ecuc(Dem/DemGeneral/DemOperationCycle.DemLeadingCycleRef)} != NULL	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.14 Dem_SetCycleQualified

Function Name	Dem_SetCycleQualified	
Syntax	Std_ReturnType Dem_SetCycleQualified(uint8 OperationCycleId)	
Service ID [Hex]	0x56	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (In)	OperationCycleId	Identification of a configured DemOperationCycle
Parameters(Inout)	None	
Parameters (Out)	isQualified	TRUE: The dependent operation cycle is qualified. FALSE: The qualification conditions of the dependent operation cycle have not been met.
Return Value	Std_ReturnType	Always E_OK is returned.
Description	Sets a dependent operation cycle as qualified, so it may be processed along with its leading cycle.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.15 Dem_GetDTCSeverityAvailabilityMask

Function Name	Dem_GetDTCSeverityAvailabilityMask	
Syntax	Std_ReturnType Dem_GetDTCSeverityAvailabilityMask(uint8 ClientId, Dem_DTCSeverityType* DTCSeverityMask)	
Service ID [Hex]	0xb2	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	ClientId	Unique client id, assigned to the instance of the calling module.
Parameters(Inout)	None	
Parameters (Out)	DTCSeverityMask	DTCSeverityMask The value DTCSeverityMask indicates

		the supported DTC severity bits from the Dem. All supported information is indicated by setting the corresponding status bit to 1. See ISO14229-1.
Return Value	Std_ReturnType	E_OK: get of DTC severity mask was successful E_NOT_OK: get of DTC severity mask failed
Description	Gets the DTC Severity availability mask.	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.16 Dem_GetB1Counter

Function Name	Dem_GetB1Counter	
Syntax	Std_ReturnType Dem_GetB1Counter(uint16* B1Counter)	
Service ID [Hex]	0xb4	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (In)	None	
Parameters(Inout)	None	
Parameters (Out)	B1Counter	Buffer containing the B1 counter. The buffer is provided by the application with the size of 2 bytes.
Return Value	Std_ReturnType	Always E_OK is returned, as E_NOT_OK will never appear.
Description	Service to report the value of the B1 counter computed by the Dem. API is needed in WWH-OBd relevant ECUs only	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.3.7.17 Dem_SetDTR

Function Name	Dem_SetDTR	
Syntax	Std_ReturnType Dem_SetDTR(uint16 DTRId, sint32 TestResult, sint32 LowerLimit, sint32 UpperLimit, Dem_DTRControlType Ctrlval)	
Service ID [Hex]	0xa2	
Sync/Async	Synchronous	
Reentrancy	Re-entrant for different ClientIDs, Non re-entrant for same ClientId.	
Parameters (In)	DTRId	Identification of a DTR element by assigned DTRId.
	TestResult	Test result of DTR
	LowerLimit	Lower limit of DTR

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	UpperLimit	Upper limit of DTR
	Ctrlval	Control value of the DTR to support its interpretation Dem-internally.
Parameters(Inout)	None	
Parameters (Out)	None	
Return Value	Std_ReturnType	E_OK: Report of DTR result successful E_NOT_OK: Report of DTR result failed
Description	<p>Reports a DTR result with lower and upper limit. The internal eventstatus serves as master whether the DTR values are forwarded or ignored, also taking the DTRUpdateKind into account.</p> <p>The EventId that is related to the DTR is assigned per configuration (and derived from ServiceNeeds). Processing takes enable/storage conditions into account.</p> <p>API is needed in OBD-relevant ECUs only.</p> <p>API Availability: This API will be available only if {ecuc(Dem/DemGeneral.DemOBDSupport)} != DEM_OBD_NO_OBD_SUPPORT</p>	
Preconditions	None	
Configuration Dependency	None	
Available via	Dem.h	

6.4 Service Interfaces

6.4.1 CallbackClearEventAllowed

Name	CallbackClearEventAllowed		
Comment	If configured, it gets the permission to clear a specific event from the SW-C. For each event, there can be one port of this interface type.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	
Available via	CanIf.h		

Operations:

Name	CallbackClearEventAllowed		
Comment	If configured, it gets the permission to clear a specific event from the SW-C. For each event, there can be one port of this interface type.		
Variation	--		
Parameters	Allowed	Comment	True - clearance of event is allowed False - clearance of event is not allowed
		Type	boolean
		Variation	--
		Direction	OUT

Possible Errors	0	E_OK
	1	E_NOT_OK

6.4.2 CallbackClearEventAllowed

Name	CallbackComponentStatusChanged		
Comment	--		
IsService	true		
Variation	--		
Possible Errors	--		

Operations:

Name	ComponentStatusChanged		
Variation	--		
Parameters	ComponentFailedStatus	Comment	--
		Type	boolean
		Variation	--
		Direction	IN

6.4.3 CallbackDTCStatusChange

Name	CallbackDTCStatusChange		
Comment	If configured it triggers SW-Cs on DTC status byte changes via DemCallbackDTCStatusChanged, DemCallbackOBDDTCStatusChanged, and / or DemCallbackJ1939DTCStatusChanged. There can be several ports of this interface type, provided globally by the Dem Service Component.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

Name	ComponentStatusChanged		
Variation	--		
Parameters	DTC	Comment	--
		Type	Uint32
		Variation	--
		Direction	IN
	DTCStatusOld	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN

	DTCStatusNew	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.4 CallbackEventDataChanged

Name	CallbackEventDataChanged		
Comment	If configured it triggers SW-Cs on event related data changes. For each event, there can be one port of this interface type.		
IsService	true		
Variation	--		
Possible Errors	--	--	--

Operations:

Name	EventDataChanged
Variation	--

6.4.5 CallbackEventUdsStatusChanged

Name	CallbackEventUdsStatusChanged		
Comment	If configured it triggers SW-Cs on event status byte changes. For each event, there can be several ports of this interface type.		
IsService	true		
Variation	--		
Possible Errors	--	--	--

Operations:

Name	CallbackEventUdsStatusChanged		
Variation	--		
Parameters	EventStatusByteOld	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN
	EventStatusByteNew	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN

6.4.6 CallbackGetFaultDetectCounter

Name	CallbackGetFaultDetectCounter		
Comment	If configured it get the monitor-internal fault detection counter value of a specific event from the SW-C.		

IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

Name	CallbackEventUdsStatusChanged		
Variation	--		
Parameters	FaultDetectionCounter	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.7 CallbackInitMonitorForEvent

Name	CallbackInitMonitorForEvent		
Comment	If configure it triggers an event-specific initialization of the monitor part of the SW-C). For each event, there can be one port of this interface type.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

Name	InitMonitorForEvent		
Comments	--		
Variation	--		
Parameters	InitMonitorReason	Comment	--
		Type	Dem_InitMonitorReasonType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.8 CallbackMonitorStatusChange

Name	CallbackMonitorStatusChange		
Comment	If configured it triggers SW-Cs on monitor status changes. For each event, there can be several ports of this interface type.		
IsService	true		
Variation	--		
Possible Errors	--	--	

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Operations:

Name	MonitorStatusChanged
Comments	--
Variation	--

6.4.9 ClearDtcNotification

Name	ClearDtcNotification		
Comment	(count({ecuc(Dem/DemGeneral/DemEventMemorySet/ DemClearDTCNotification/DemClearDtcNotificationFnc)}) == NULL) > 0)		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	

Operations:

Name	ClearDtcNotification		
Variation	--		
Parameters	DTC	Comment	--
		Type	Uint32
		Variation	--
		Direction	IN
	DTCFormat	Comment	--
		Type	Dem_DTCFormatType
		Variation	--
		Direction	IN
	DTCOrigin	Comment	--
		Type	Dem_DTCOriginType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	

6.4.10 ClearDTC

Name	ClearDTC		
Comment	Provides the operations only related to complex device drivers. One port of this interface type is provided globally by the Dem Service Component. It has ClientId as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	
	4	DEM_PENDING	
	5	DEM_CLEAR_BUSY	
	6	DEM_CLEAR_MEMORY_ERROR	
	7	DEM_CLEAR_FAILED	

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	8	DEM_WRONG_DTC
	9	DEM_WRONG_DTCORIGIN
	22	DEM_BUSY

Operations:

ClearDTC			
Comments	--		
Variation	--		
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	DTC selected	
	DEM_PENDING	Clearing the DTCs is currently in progress.	
	DEM_CLEAR_BUSY	The caller shall call this function again at a later moment.	
	DEM_CLEAR_MEMORY_ERROR	Another client is currently clearing DTCs. The	
	DEM_CLEAR_FAILED	requested operation will not be started and	
	DEM_WRONG_DTC	the caller shall try again at a later moment.	
	DEM_WRONG_DTCORIGIN	An error occurred during erasing a memory	
	DEM_BUSY	location (e.g. if DemClearDTCBehavior is set	
SelectDTC			
Comments	--		
Variation	--		
Possible Errors	DTC	Comment	--
		Type	uint32
		Variation	--
		Direction	IN
	DTCFormat	Comment	--
		Type	Dem_DTCFormatType
		Variation	--
		Direction	IN
	DTCOrigin	Comment	--
		Type	Dem_DTCOriginType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	No DTC selected	

6.3.2.11 DTCSuppression

Name	DTCSuppression		
Comment	Provides the capability to control the suppression of DTCs. One port of this interface type is provided globally by the Dem Service Component.		
IsService	true		
Variation	{(ecuc(Dem/DemGeneral/DemSuppressionSupport)) == DEM_DTC_SUPPRESSION)		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

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	4	DEM_PENDING
	8	DEM_WRONG_DTC
	9	DEM_WRONG_DTCORIGIN

Operations:

GetDTCSuppression			
Comments	--		
Variation	--		
	ClientID	Comment	Unique client id, assigned to the instance of the calling module.
		Type	uint8
		Variation	--
		Direction	IN
	SuppressionStatus	Comment	Defines whether the respective DTC is suppressed (TRUE) or enabled (FALSE).
		Type	boolean
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	No DTC selected.	
	DEM_PENDING	The requested value is calculated asynchronously and currently not available. The caller can retry later	
	DEM_WRONG_DTC	Selected DTC value in selected format does not exist.	
	DEM_WRONG_DTCORIGIN	Selected DTCOrigin does not exist.	
SetDTCSuppression			
Comments	--		
Variation	--		
Parameters	ClientID	Comment	Unique client id, assigned to the instance of the calling module.
		Type	uint8
		Variation	--
		Direction	IN
	SuppressionStatus	Comment	--
		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	No DTC selected	
	DEM_WRONG_DTC	Selected DTC value in selected format does not exist.	
	DEM_WRONG_DTCORIGIN	Selected DTCOrigin does not exist.	

6.4.12 DataServices_{Data}

Name	DataServices_{Data}	
Comment	If configured it gets the data element value contained in a DID, a PID, or an extended data record from the respective SW-C via client/server or sender/receiver communication (refer to Figure "Dem and Dcm module requests PID data elements of SW-C via ReadData operation"). For each data element, one port of this interface type is provided by the SW-Cs.	
IsService	true	
Variation	(({ecuc(Dem/DemGeneral/DemDataElementClass)}) instanceof {ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass)}) && ({ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass/DemDataElementUsePort)} == true)) Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

ReadData			
Comments	The server is not allowed to return E_NOT_OK, but shall always provide a valid data value (e.g. a default/replacement value in an error-case) to Dcm/Dem nevertheless the signature of the operation includes E_NOT_OK to ensure compatibility between server runnable and RTE Call API, since the RTE may return negative Std_Return values in certain cases (e.g. partition of server stopped)		
Variation	--		
Parameters	Data	Comment	--
		Type	Dem_DataType_{Data}
		Variation	Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}
		Direction	OUT
	monitorData0	Comment	--
		Type	Dem_MonitorDataType
		Variation	(({ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass/DemDataElementProvideMonitorData)}) == true))
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.13 DTRCentralReport

Name	DTRCentralReport	
Comment	If configured it gets the data element value contained in a DID, a PID, or an extended data record from the respective SW-C via client/server or sender/receiver communication (refer to Figure "Dem and Dcm module requests PID data elements of SW-C via ReadData operation"). For each data element, one port of this interface type is provided by the SW-Cs.	
IsService	true	
Variation	(({ecuc(Dem/DemGeneral/DemDataElementClass)}) instanceof {ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass)}) && ({ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass/DemDataElementUsePort)} == true)) Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

ReadData			
Comments	The server is not allowed to return E_NOT_OK, but shall always provide a valid data value (e.g. a default/replacement value in an error-case) to Dcm/Dem nevertheless the signature of the operation includes E_NOT_OK to ensure compatibility between server runnable and RTE Call API, since the RTE may return negative Std_Return values in certain cases (e.g. partition of server stopped)		
Variation	--		
Parameters	Data	Comment	--
		Type	Dem_DataType_{Data}
		Variation	Data = {ecuc(Dem/DemGeneral/DemDataElementClass.SHORT-NAME)}
		Direction	OUT
	monitorData0	Comment	--
		Type	Dem_MonitorDataType
		Variation	(({ecuc(Dem/DemGeneral/DemDataElementClass/DemExternalCSDataElementClass/DemDataElementProvideMonitorData)} == true))
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.14 DiagnosticInfo

Name	DiagnosticInfo	
Comment	Provides the capability to obtain the event information. One port of this interface type is provided per diagnostic event by the Dem Service Component. It has EventId as a port-defined argument.	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK
	10	DEM_E_NO_DTC_AVAILABLE
	14	DEM_E_NO_FDC_AVAILABLE
	21	DEM_BUFFER_TOO_SMALL
	48	DEM_NO_SUCH_ELEMENT

Operations:

GetDTCOfEvent			
Comments	--		
Variation	--		
Parameters	DTCFormat	Comment	--
		Type	Dem_DTCFormatType
		Variation	--
		Direction	IN
	DTCOfEvent	Comment	--
		Type	uint32
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_E_NO_DTC_AVAILABLE	there is no DTC configured in the requested format	

GetDebouncingOfEvent			
Comments	--		
Variation	<pre>((ecuc(Dem/DemConfigSet/DemEventParameter/ DemDebounceAlgorithmClass)) instanceof {ecuc(Dem/ DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/ DemDebounceCounterBased)}) ({ecuc(Dem/DemConfigSet/ DemEventParameter/DemDebounceAlgorithmClass)) instanceof {ecuc(Dem/DemConfigSet/DemEventParameter/ DemDebounceAlgorithmClass/DemDebounceTimeBase)})</pre>		
Parameters	DebouncingState	Comment	Bit 0 Temporarily Defective (corresponds to $0 < FDC < 127$)
			Bit 1 finally Defective (corresponds to $FDC = 127$)
			Bit 2 temporarily healed (corresponds to $-128 < FDC < 0$)

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			Bit 3 Test complete (corresponds to FDC = -128 or FDC = 127) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
		Type	Dem_DebouncingStateType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

GetEventExtendedDataRecordEx			
Comments	--		
Variation	--		
Parameters	RecordNumber	Comment	--
		Type	uint8
		Variation	--
		Direction	IN
	DestBuffer	Comment	--
		Type	Dem_MaxDataValueType
		Variation	--
		Direction	OUT
	Bufsize	Comment	--
		Type	uint16
		Variation	--
		Direction	INOUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_BUFFER_TOO_SMALL	The provided buffer size is too small	
	DEM_NO_SUCH_ELEMENT	The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame (GetEventFreezeFrameDataEx)	

GetEventFreezeFrameDataEx			
Comments	--		
Variation	--		
Parameters	RecordNumber	Comment	--
		Type	uint8
		Variation	--
		Direction	IN
	DataId	Comment	--

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		Type	uint16
		Variation	--
		Direction	IN
	DestBuffer	Comment	--
		Type	Dem_MaxDataValueType
		Variation	--
	BufSize	Direction	OUT
		Comment	--
		Type	uint16
		Variation	--
		Direction	INOUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_BUFFER_TOO_SMALL	The provided buffer size is too small	
	DEM_NO_SUCH_ELEMENT	The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame (GetEventFreezeFrameDataEx)	

GetEventUdsStatus			
Comments	Gets the current UDS status byte assigned to the DTC for the event		
Variation	--		
Parameters	UDSStatusByte	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
GetFaultDetectionCounter			
Comments	--		
Variation	--		
Parameters	FaultDetectionCounter	Comment	--
		Type	sint8
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_E_NO_FDC_AVAILABLE	there is no fault detection counter available for the requested event	

GetMonitorStatus	
Comments	--
Variation	--

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Parameters	MonitorStatus	Comment	Monitor status byte of the requested event. If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
		Type	Dem_MonitorStatusType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.15 DiagnosticInfo

Name	DiagnosticMonitor		
Comment	Provides the capability to obtain the event information. One port of this interface type is provided per diagnostic event by the Dem Service Component. It has EventId as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

ClearPrestoredFreezeFrame			
Comments	--		
Variation	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
Possible Errors	E_OK	Request to reset the event status was successful accepted.	
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.	

PrestoreFreezeFrame			
Comments	--		
Variation	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
Possible Errors	E_OK	Request to reset the event status was successful accepted.	
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.	

ResetEventDebounceStatus			
Comments	--		
Variation	({ecuc(Dem/DemGeneral/DemDebounceCounterBasedSupport)}) == true) ({ecuc(Dem/DemGeneral/		

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DemDebounceTimeBasedSupport)) == true)			
Parameters	DebounceResetStatus	Comment	--
		Type	Dem_DebounceResetStatusType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Request to reset the event status was successful accepted.	
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.	

ResetEventStatus		
Comments	--	
Variation	--	
Possible Errors	E_OK	Operation successful
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.

SetEventDisabled		
Comments	--	
Variation	{ecuc(Dem/DemGeneral.DemOBDSupport)) != DEM_OBD_NO_OBD_SUPPORT	
Possible Errors	E_OK	Request to reset the event status was successful accepted.
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.

SetEventStatus			
Comments	--		
Variation	--		
Parameters	EventStatus	Comment	--
		Type	Dem_EventStatusType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Request to reset the event status was successful accepted.	
	E_NOT_OK	Request to reset the event status failed or is not allowed, because the event is already tested in this operation cycle.	

6.4.16 DiagnosticInfo

Name	DiagnosticMonitor_MonitorData
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Comment	Provide means to report diagnostic monitor status with monitor data.	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetEventStatusWithMonitorData			
Comments	--		
Variation	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
Parameters	EventStatus	Comment	--
		Type	Dem_EventStatusType
		Variation	--
		Direction	IN
	monitorData0	Comment	--
		Type	Dem_MonitorDataType
		Variation	--
		Direction	IN
	monitorData1	Comment	--
		Type	Dem_MonitorDataType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.17 EnableCondition

Name	EnableCondition	
Comment	If at least one enable condition is configured it provide the capability to set an enable condition. One port of this interface type is provided per enable condition by the Dem Service Component. It has EnableConditionId as a port-defined argument.	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetEventStatusWithMonitorData			
Comments	--		
Variation	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
Parameters	ConditionFulfilled	Comment	--
		Type	boolean
		Variation	--
		Direction	IN

Possible Errors	E_OK	Operation successful
	E_NOT_OK	Operation failed

6.4.18 EventAvailable

Name	EventAvailable	
Comment	--	
IsService	true	
Variation	{ecuc(Dem/DemGeneral/DemAvailabilitySupport)} == DEM_EVENT_AVAILABILITY	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetEventAvailable			
Comments	--		
Variation	{ecuc(Dem/DemGeneral/DemMaxNumberPrestoredFF)} > 0		
Parameters	AvailableStatus	Comment	--
		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Request to set the availability status was successful.	
	E_NOT_OK	Request to set the availability status not accepted.	

6.4.19 EventFailureCycleCounterThreshold

Name	EventFailureCycleCounterThreshold		
Comment	Provides the capability for dynamical adaptation of the failure cycle threshold. One port of this interface is provided per diagnostic event with EventId as a port-defined argument		
IsService	true		
Variation	(count({ecuc(Dem/DemConfigSet/DemEventParameter/DemEventFailureCycleCounterThresholdAdaptable)} == TRUE) > 0)		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

SetEventFailureCycleCounterThreshold			
Comments	--		
Variation	--		
Parameters	FailureCycleCounterThreshoIdomment	Comment	Failure cycle counter threshold of event to be set.
		Type	uint8

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		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.20 EventFailureCycleCounterThreshold

Name	EvMemOverflowIndication		
Comment	If the respective event memory is configured it provides the status of the event memory). One port of this interface type is provided per supported event memory by the Dem Service Component. It has DTCTOrigin as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

GetEventMemoryOverflow			
Comments	--		
Variation	--		
Parameters	OverflowIndication	Comment	--
		Type	boolean
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

GetNumberOfEventMemoryEntries			
Comments	--		
Variation	--		
	GetNumberOfEventMemoryECnotrmirmsent	Comment	--
		Type	uint8
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.21 EventStatus

Name	EventStatus
Comment	Provides the capability modify the event status. One port of this interface type is provided per application-related diagnostic event by the Dem Service Component. It has EventId as a port-defined argument.

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IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

GetEventMemoryOverflow			
Comments	--		
Variation	--		
Parameters	WIRStatus	Comment	--
		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Request to set the WIR status was successful.	
	E_NOT_OK	Request to set the WIR status was not accepted (e.g. disabled controlDTCSetting) and should be repeated.	

6.4.22 GeneralCallbackEventDataChanged

Name	GeneralCallbackEventDataChanged
Comment	--
IsService	true
Variation	--
Possible Errors	--

Operations:

EventDataChanged			
Comments	--		
Variation	--		
Parameters	WIRStatus	Comment	--
		Type	boolean
		Variation	--
		Direction	IN

6.4.23 GeneralCallbackEventUdsStatusChanged

Name	GeneralCallbackEventUdsStatusChanged
Comment	--
IsService	true
Variation	--
Possible Errors	--

Operations:

GeneralCallbackEventUdsStatusChanged

Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	EventStatusByteOld	Comment	
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN
	EventStatusByteNew	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	IN

6.4.24 GeneralCallbackMonitorStatusChanged

Name	GeneralCallbackMonitorStatusChanged
Comment	--
IsService	true
Variation	--
Possible Errors	--

Operations:

MonitorStatusChanged			
Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN

6.4.25 GeneralDiagnosticInfo

Name	GeneralDiagnosticInfo	
Comment	--	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK
	10	DEM_E_NO_DTC_AVAILABLE
	14	DEM_E_NO_FDC_AVAILABLE
	21	DEM_BUFFER_TOO_SMALL
	48	DEM_NO_SUCH_ELEMENT

Operations:

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GetDTCOfEvent			
Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	DTCFormat	Comment	--
		Type	Dem_DTCFormatType
		Variation	--
		Direction	IN
	DTCOfEvent	Comment	--
		Type	uint32
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_E_NO_DTC_AVAILABLE	there is no DTC configured in the requested format	

GetDebouncingOfEvent			
Comments	--		
Variation	(((ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass)) instanceof {ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/DemDebounceCounterBased)}) ({ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass)) instanceof {ecuc(Dem/DemConfigSet/DemEventParameter/DemDebounceAlgorithmClass/DemDebounceTimeBase)}}))		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	DebouncingState	Comment	Bit 0 Temporarily Defective (corresponds to 0 < FDC < 127) Bit 1 finally Defective (corresponds to FDC = 127) Bit 2 temporarily healed (corresponds to -128 < FDC < 0) Bit 3 Test complete (corresponds to FDC = -128 or FDC = 127) Bit 4 DTR Update (= Test complete && Debouncing complete && enable conditions / storage conditions fulfilled)
		Type	Dem_DebouncingStateType
		Variation	--

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		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

GetEventExtendedDataRecordEx			
Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	RecordNumber	Comment	--
		Type	uint8
		Variation	--
		Direction	IN
	DestBuffer	Comment	--
		Type	Dem_MaxDataValueType
		Variation	--
		Direction	OUT
	Bufsize	Comment	--
		Type	uint16
		Variation	--
		Direction	INOUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_BUFFER_TOO_SMALL	The provided buffer size is too small	
	DEM_NO_SUCH_ELEMENT	The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame (GetEventFreezeFrameDataEx)	

GetEventFreezeFrameDataEx			
Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	RecordNumber	Comment	--
		Type	uint8
		Variation	--
		Direction	IN
	DataId	Comment	--

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		Type	uint16
		Variation	--
		Direction	IN
	DestBuffer	Comment	--
		Type	Dem_MaxDataValueType
		Variation	--
	BufSize	Direction	OUT
		Comment	--
		Type	uint16
		Variation	--
		Direction	INOUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_BUFFER_TOO_SMALL	The provided buffer size is too small	
	DEM_NO_SUCH_ELEMENT	The requested event data is not currently stored (but the request was valid) OR The requested record number is not supported by the event OR The requested DID is not supported by the freeze frame (GetEventFreezeFrameDataEx)	

GetEventUdsStatus			
Comments	Gets the current UDS status byte assigned to the DTC for the event		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	UDSStatusByte	Comment	--
		Type	Dem_UdsStatusByteType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
GetFaultDetectionCounter			
Comments	--		
Variation	--		
Parameters	FaultDetectionCounter	Comment	--
		Type	sint8
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	
	DEM_E_NO_FDC_AVAILABLE	there is no fault detection counter available for the requested event	

GetMonitorStatus			
Comments	--		
Variation	--		
Parameters	EventId	Comment	--
		Type	Dem_EventIdType
		Variation	--
		Direction	IN
	MonitorStatus	Comment	Monitor status byte of the requested event. If the return value of the function call is E_NOT_OK, this parameter does not contain valid data.
		Type	Dem_MonitorStatusType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.26 GetDataOfPID21

Name	GetDataOfPID21	
Comment	--	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

GetDataOfPID21			
Comments	--		
Variation	--		
Parameters	PID21value	Comment	--
		Type	Dem_PID21valueType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.27 IndicatorStatus

Name	IndicatorStatus	
Comment	One port of this interface type is provided per indicator by the Dem Service Component. It has IndicatorId as a port-defined argument	
IsService	true	
Variation	--	
Possible Errors	0	E_OK

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	1	E_NOT_OK
--	---	----------

Operations:

GetDataOfPID21			
Comments	--		
Variation	--		
Parameters	IndicatorStatus	Comment	--
		Type	Dem_IndicatorStatusType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.28 IUMPRDenominator

Name	IUMPRDenominator		
Comment	If OBD is configured it provides the capability to define the number of times the vehicle operation has been fulfilled. One port of this interface type is provided per ratio Id by the Dem Service Component. It has RatioId as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

RepiUMPRDenRelease			
Comments	--		
Variation	--		
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.29 IUMPRDenominatorCondition

Name	IUMPRDenominatorCondition		
Comment	If OBD is configured it broadcasts the status information of the General Denominator and additional denominator conditions among all OBD relevant ECUs. One port of this interface type is provided per denominator condition Id by the Dem Service Component. It has Dem_IumprDenomCondId as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

GetDataOfPID21			
Comments	--		
Variation	--		
Parameters	ConditionStatus	Comment	--
		Type	Dem_lumprDenomCondStatusType
		Variation	--
		Direction	OUT
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

SetIUMPRDenCondition			
Comments	--		
Variation	--		
Parameters	ConditionStatus	Comment	--
		Type	Dem_lumprDenomCondStatusType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.30 IUMPRNumerator

Name	IUMPRNumerator		
Comment	If OBD is configured it provides the capability to define the number of times a fault could have been found. One port of this interface type is provided per ratio Id by the Dem Service Component. It has RatioID as a port-defined argument.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

ReplUMPRFaultDetect			
Comments	--		
Variation	--		
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.31 OperationCycle

Name	OperationCycle		
Comment	Provides the capability to set the state of an operation cycle. One port of this interface type is provided per operation cycle by the Dem Service Component. It has OperationCycleId as a port-defined		

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	argument.	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

GetCycleQualified			
Comments	--		
Variation	--		
Parameters	isQualified	Comment	--
		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

RestartOperationCycle			
Comments	--		
Variation	--		
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

SetCycleQualified			
Comments	--		
Variation	--		
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.32 PowerTakeOff

Name	PowerTakeOff		
Comment	Available if OBD support is configured. One port of this interface type is provided by the Dem Service Component.		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	PtoStatus	Comment	--

		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.33 SetDataOfPID21

Name	SetDataOfPID21		
Comment	--		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	PID21value	Comment	--
		Type	Dem_PID21valueType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.34 SetDataOfPID31

Name	SetDataOfPID31		
Comment	--		
IsService	true		
Variation	--		
Possible Errors	0	E_OK	
	1	E_NOT_OK	

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	PID31value	Comment	--
		Type	Dem_PID31valueType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.35 SetDataOfPID4D

Name	SetDataOfPID4D	
Comment	--	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	PID31value	Comment	--
		Type	Dem_PID4DvalueType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.36 SetDataOfPID4E

Name	SetDataOfPID4E	
Comment	--	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	PID4Evalue	Comment	--
		Type	Dem_PID4EvalueType
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.4.37 StorageCondition

Name	StorageCondition
Comment	Provides the capability to set a storage condition if at least one storage condition is configured. One port of this interface type is

	provided per storage condition by the Dem Service Component. It has StorageConditionId as a port-defined argument.	
IsService	true	
Variation	--	
Possible Errors	0	E_OK
	1	E_NOT_OK

Operations:

SetPtoStatus			
Comments	--		
Variation	--		
Parameters	ConditionFulfilled	Comment	This parameter specifies whether the enable condition assigned to the EnableConditionID is fulfilled (TRUE) or not fulfilled (FALSE).
		Type	boolean
		Variation	--
		Direction	IN
Possible Errors	E_OK	Operation successful	
	E_NOT_OK	Operation failed	

6.3.2 Note

<For notice something>

7 Generator

7.1 Generator Option

Options	Description
-G,--Generation	Symbolic parameters to be used for fore generation (skip validation).
-H,--Help	Display this help message.
-I,--Input <I>	ECU description file path of the module for which generation tool need to run.
-L,--Log	Symbolic parameters to be used for generation error log.
-M,--Module <M>	Specify module name and version to be generated code for.
-O,--Output <O>	Project-relative path to location where the generated code is to be placed.
-T,--Top_path <T>	Symbolic parameters to be used for set path of module.
-V,--Validate	Symbolic parameters to be used for invoking validation checks.

7.2 Generator Error Message

This chapter describes all error message following validation rules of module Dem

ERR054001: If DemMirrorMemory is configured as DemMemoryDestinationRef, another DemMemoryDestinationRef on the same event of either DemPrimaryMemory or DemUserDefinedMemory shall be configured as a prerequisite. The same event shall not be configured two destinations if one is not DemMirrorMemory.

ERR054002: A DTC can only reference the event memories via DemMemoryDestinationRef to the event memories of the same DemEventMemorySet. The scenario that a DTC references event memories via DemMemoryDestinationRef on different DemEventMemorySet is not supported.

ERR054003: Setting DemComponentFailedCallbackUsePort to TRUE is only allowed, if DemComponentFailedCallbackFnc is not configured.

ERR054004: The OBD DTC DemDtcValue shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054006: Events may be assigned to exactly one DemComponent for which the monitoring is testing the error conditions. Multiple events may be assigned to the same component.

ERR054007: Unique DTC values within a single event memory : The DemDtcValue shall be unique within all DTCs referencing the same event memory.

ERR054008: Unique OBD DTC values within an ECU The DemDtcValue shall be unique within all DTCs referencing the same event memory.

ERR054010: The DemGeneralCallbackMonitorStatusChangedFnc shall only be present if DemGeneralInterfaceSupport is set to TRUE.

ERR054013: DemTimeBasedFdcThresholdStorageValue shall only be present if DemFreezeFrameRecordTrigger is set to DEM_TRIGGER_ON_FDC_THRESHOLD or DemExtendedDataRecordTrigger is set to DEM_TRIGGER_ON_FDC_THRESHOLD or DemEventMemoryEntryStorageTrigger is set to DEM_TRIGGER_ON_FDC_THRESHOLD (refer to DemPrimaryMemory or DemUserDefinedMemory).

ERR054014: The configuration parameter DemCounterBasedFdcThresholdStorageValue shall only be present if DemFreezeFrameRecordTrigger is set to DEM_TRIGGER_ON_FDC_THRESHOLD or DemExtendedDataRecordTrigger is set

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to DEM_TRIGGER_ON_FDC_THRESHOLD or DemEventMemoryEntryStorageTrigger is set to DEM_TRIGGER_ON_FDC_THRESHOLD.

ERR054015: DemDebounceCounterJumpDownValue shall only be present if DemDebounceCounterJumpDown is set to TRUE.

ERR054016: DemDebounceCounterJumpUpValue shall only be present if DemDebounceCounterJumpUp is set to TRUE.

ERR054019: The DemMaxNumberEventEntryEventBuffer shall only be present if DemEnvironmentDataCapture is set to DEM_CAPTURE_SYNCHRONOUS_TO_REPORTING (refer to DemPrimaryMemory or DemUserDefinedMemory).

ERR054020: The DemOccurrenceCounterProcessing (refer to DemPrimaryMemory or DemUserDefinedMemory) shall only be present if DemEnvironmentDataCapture is set to DEM_CAPTURE_SYNCHRONOUS_TO_REPORTING (refer to DemPrimaryMemory or DemUserDefinedMemory).

ERR054022: DemPTOSupport shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054023: DemAgingCycleCounterThreshold shall only be present if DemAgingAllowed is set to TRUE.

ERR054024: DemAgingCycleCounterThresholdForTFSLC shall only be present if DemStatusBitHandlingTestFailedSinceLastClear is set to DEM_STATUS_BIT_AGING_AND_DISPLACEMENT.

ERR054025: DemMaxNumberFreezeFrameRecords shall only be present if DemTypeOfFreezeFrameRecordNumeration is set to DEM_FF_RECNUM_CALCULATED.

ERR054026: DemAgingCycleRef shall only be present if DemAgingAllowed is set to TRUE

ERR054027: DemFreezeFrameRecNumClassRef shall only be present if that DTC references a fault memory that has DemTypeOfFreezeFrameRecordNumeration is set to DEM_FF_RECNUM_CONFIGURED (refer to DemPrimaryMemory or DemUserDefinedMemory).

ERR054028: DemReportBehavior shall only be present if DemEventKind is set to DEM_EVENT_KIND_SWC.

ERR054029: DemOBDDGroupingAssociativeEventsRef shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054030: DemOBDCentralizedPID21Handling shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054031: DemOBDCentralizedPID31Handling shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054032: DemOBDCompliancy shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054033: DemOBDEngineType shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054034: DemOBDEventDisplacement shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

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ERR054035: DemOBDDInputAcceleratorPedalInformation shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054036: DemOBDDInputAmbientPressure shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054037: DemOBDDInputAmbientTemperature shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054038: DemOBDDInputDistanceInformation shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054039: DemOBDDInputEngineSpeed shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054040: DemOBDDInputEngineTemperature shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054041: DemOBDDInputProgrammingEvent shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054042: DemOBDDInputVehicleSpeed shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054043: DemConsiderPtoStatus shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054044: DemExtendedDataRecordTrigger shall always be configured, except for internal data elements like occurrence counters.

ERR054045: Existence of size parameter DemDataElementArraySize [ECUC_Dem_00949] in container DemExternalCSDDataElement- Class shall be present if DemDataElementDataType [ECUC_Dem_00950] in the same container is set to: UINT8_N, SINT8_N, UINT16_N, SINT16_N, UINT32_N, SINT32_N.

ERR054046: Restrictions on size parameter for 16 Bit arrays DemDataElementArraySize [ECUC_Dem_00949] shall be a multiple of 2 if the value is greater than 2 and DemDataElementDataType [ECUC_Dem_00950] is UINT16_N or SINT16_N.

ERR054047: Restrictions on size parameter for 32 Bit arrays DemDataElementArraySize [ECUC_Dem_00949] shall be a multiple of 4 if the value is greater than 4 and DemDataElementDataType [ECUC_Dem_00950] is UINT32_N or SINT32_N.

ERR054048: Existence of size parameter DemDataElementArraySize [ECUC_Dem_00967] in container DemExternalSRDataElement- Class shall be present if DemDataElementDataType [ECUC_Dem_00840] in the same container is set to: UINT8_N, SINT8_N, UINT16_N, SINT16_N, UINT32_N, SINT32_N.

ERR054049: DataElementArraySize [ECUC_Dem_00949] shall be a multiple of 2 if the value is greater than 2 and DemDataElementDataType [ECUC_Dem_00840] is UINT16_N or SINT16_N.

ERR054050: DataElementArraySize [ECUC_Dem_00949] shall be a multiple of 4 if the value is greater than 4 and DemDataElementDataType [ECUC_Dem_00840] is UINT32_N or SINT32_N.

ERR054051: DemMILIndicatorRef shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

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ERR054052: The container DemPidClass and aggregated sub-container shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054053: DemEventOBDRreadinessGroup shall only be present if DemOBDSupport is set to DEM_OBD_MASTER_ECU.

ERR054054: The container DemRatio shall only be available if DemOBDSupport is set to DEM_OBD_MASTER_ECU.

ERR054055: The container DemDtr shall only be available if DemOBDSupport is set to DEM_OBD_MASTER_ECU or DEM_OBD_PRIMARY_ECU.

ERR054062: If DemMirrorMemory is configured as DemMemoryDestinationRef, another DemMemoryDestinationRef on the same event of either DemPrimaryMemory or DemUserDefinedMemory shall be configured as a prerequisite.

ERR054065: The paramter DemExtendedDataClassRef is configured with invalid path, remove or change it to valid path.

ERR054080: Dtc value is set for UDS. DTCs short name with both OBD DTC and DTC value set: <DTC short name>.

ERR054066: The configuration value of parameter DemSupportedObdUdsDtcSeparation in Dem and the configuration value of parameter DcmDspReadDTCInformationSupportedObdUdsDtcSeparation in Dcm are mismatched.

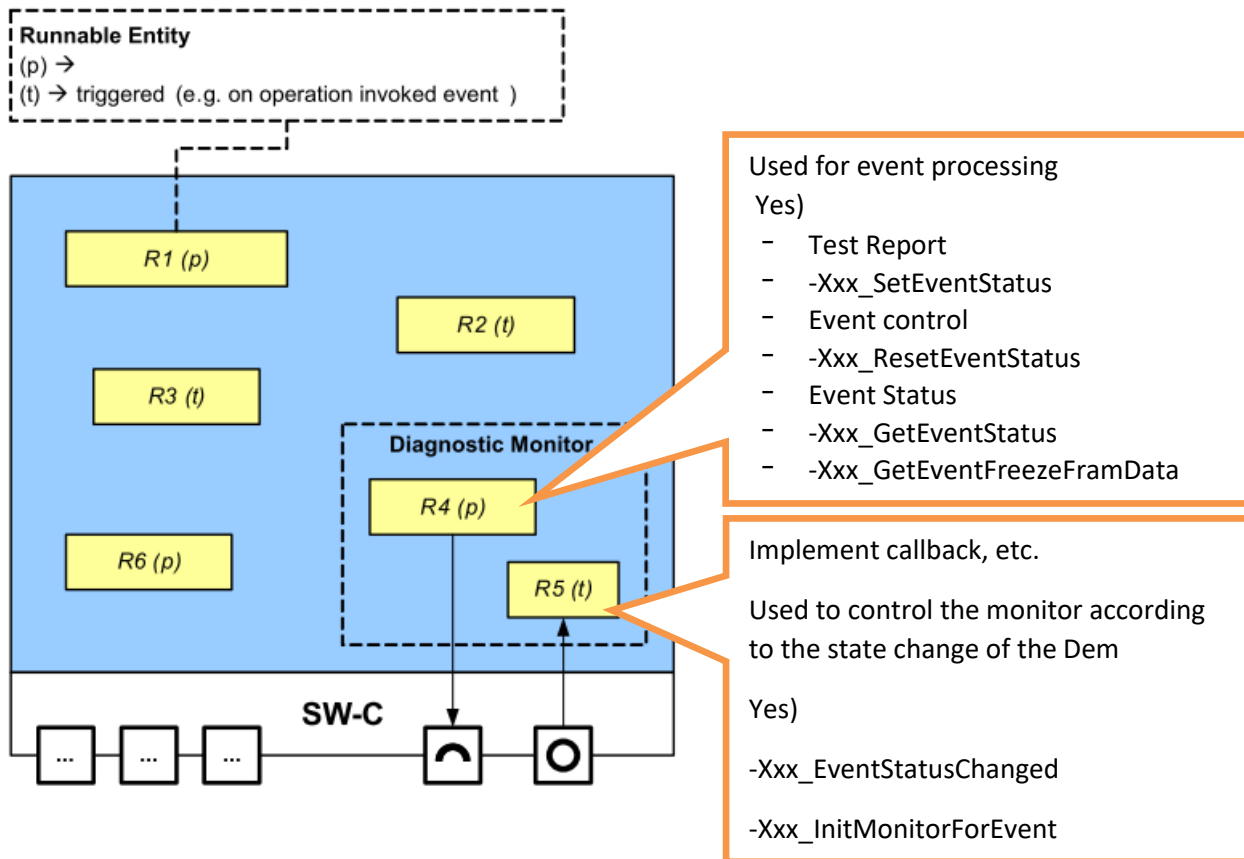
ERR054068: The number of configuraion FiMFID reference in the parameter DemFunctionIdRef should be less than 65535.

8 Appendix

8.1 Diagnostic Monitor

It is a test module (user application) that determines whether a component or system works properly.

Faults/malfunctions such as component and system (circuits, etc.) are classified into specific fault types (bus off, oped load, etc.) and connected to one diagnostic event.



8.2 Operation Cycle

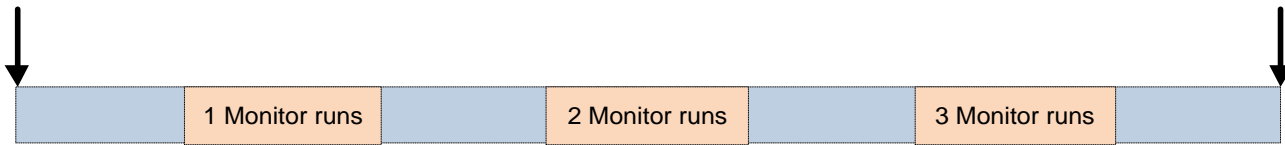
It means the unit period that processes diagnostic event. ECU can support multiple operation cycles, and the start and end of each operation cycle are controlled by the application. The operation cycle connected to the diagnostic event is controlled through RTE (start/end).

Basically defined Operation Cycle Type is as follows.

- Ignition on/off cycle (DEM_OPCYC_IGNITION)
- Power up/power down cycle (DEM_OPCYC_POWER)
- OBD driving cycle (DEM_OPCYC_OBD_DCY)
- Engine warm up cycle (DEM_OPCYC_WARMUP)
- Time based operation cycle (DEM_OPCYC_TIME)

Start of ignition operation cycle

End of ignition operation cycle



Dem processes as follows according to the status of the operation cycle assigned to the diagnostic event.

After the operation cycle starts, the diagnostic event reported by the SW-Cs (SetEventStatus Operation)/ BSW module (SetEventStatus Operation) is processed. And when the operation cycle is over, even if a diagnostic event is reported, it is ignored.

<pseudo code>

```
void IGN_ON(void)
{
    Rte_Call_OpCycle_POWER_CYCLE_RestartOperationCycle();
}

void IGN_OFF(void)
```

8.3 UDS DTC status

ISO 14229-1 [17] UDS DTC status bits defined in

Bit	Status	Description
0	TestFailed	Results of the most recently performed test. It also means the current breakdown. 1: Failed, 0: Passed
1	TestFailedThisOperationCycle	1: The test was carried out during the current Operation Cycle Failed at least once. 0: There is no failure during the current Operation Cycle. However, it is not possible to know whether the test is performed through bit 1. Whether or not the test is performed should be checked through TestNotCompletedThisOperationCycle.

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2	PendingDTC	<p>It has been reported as Failed in the current or recent Operation Cycle.</p> <p>The criterion for pendingDTC bit and TestFailedThisOperationCycle bit to be 1 is the same.</p> <p>difference</p> <p>(1) TestFailedThisOperationCycle is initialized when Operation starts.</p> <p>(2) pendingDTC is initialized only when the operation is finished without any failed enemy during the operation.</p>
3	ConfirmedDTC	<p>It becomes 1 when the Diagnostic event repeatedly fails over several Operation Cycles. It can also mean past breakdown. Depending on the configuration, it may be 1 immediately when failed is reported.</p>
4	TestNotCompletedSinceLastClear	<p>Whether the test was performed after ClearDiagnosticInformation</p> <p>1: No test has been performed.</p> <p>0: Test was performed at least once.</p>
5	TestFailedSinceLastClear	<p>After ClearDiagnosticInformation,</p> <p>1: At least once, the test result value has failed.</p> <p>0: It has never been Failed. However, it is not possible to know whether the test is performed through bit 5. Whether or not the test is performed should be checked through TestNotCompletedSinceLastClear.</p>
6	TestNotCompletedThisOperationCycle	<p>Whether the test is performed within the current operation cycle</p> <p>1: No test has been performed.</p> <p>0: Test was performed at least once.</p>
7	WarningIndicatorRequested	<p>Status of indicators (lamps, etc.) allocated to DTC.</p> <p>It becomes 1 when the Diagnostic event repeatedly fails over several Operation Cycles. Depending on the configuration, it may be 1 immediately when failed is reported.</p>

8.4 Cautions when using Operation(API)

8.4.1 Operation RestartOperationCycle

When calling RestartOperationCycle, the following operations should not be running.

- SetEventStatus
- ResetEventStatus

8.4.2 Operation SetEventStatus(Dem_EventStatusType EventStatus)

SetEventStatus does not guarantee reentrancy.

8.4.3 Check return value of Operation

Operation SetEventStatus, Operation RestartOperationCycle, etc. can return Xxx_E_NOT_OK depending on the situation. Therefore, you should always check the return value.

(1) When Operation SetEventStatus returns Xxx_E_NOT_OK

- EnableCondition
- When DisabledDTCSetting service is running
- When the ClearDiagnosticInformation service is running
- When OperationCycle is not started
- If the factor value is invalid
- If the Dem module is not initialized

(3) When Operation RestartOperationCycle returns Xxx_E_NOT_OK

- When the ClearDiagnosticInformation service is running
- When the factor value is invalid
- If the Dem module is not initialized

8.5 ClearDTC Operation (API) support

Provides ClearDTC Operation that can be used in CDD.

The screenshot shows the AUTOSAR Explorer interface. The left pane displays the project structure with 'AUTOSAR' expanded, showing 'ClientServerInterfaces' and 'Cddif'. The right pane shows the 'All Contents' view with the path 'Cddif [ClientServerInterface] > ClearDTC [ClientServerOperation]'. Below this, the 'Navigator' pane shows 'Cddif' expanded with 'Operations [1]' containing 'ClearDTC'. The 'Container Details - Operations' pane shows a table with the following data:

Index	Short Name	Possible Errors
0	ClearDTC	DEM_CLEAR_WRON...

How to use :

(1) Set Require Port, Assembly Sw Connector, etc.

* Refer to RTE and Tool manual for port setting and connection

(2) Refer to chapter 7.2.20.1 for operation prototype

(3) Pseudo Code

* The code below is a sample code to help users understand and should be used for reference only.

```
Boolean RequestClearDTC = true;
Void PeriodicTask_ClearDTC(void)
{
    If ( true == RequestClearDTC)
    {
        Std_ReturnType returnValue;
        /*
        DEM_CLEAR_WRONG_DTC : In case of using wrong DTC as input parameter
        DEM_CLEAR_WRONG_DTCORIGIN : In case of using wrong DTC Origin as input parameter
        DEM_CLEAR_FAILED:* In case of failure to delete DTC
        DEM_CLEAR_PENDING
        1. Since ClearDTC is an asynchronous function, DEM_CLEAR_PENDING is returned until the operation is
            completed.
        2. When DTC is being deleted through ClearDiagnosticInformation diagnostic service
        */
        returnValue = Rte_Call_Xxx_ClearDTC(DEM_DTC_GROUP_ALL_DTCS, DEM_DTC_FORMAT_UDS,
        DEM_DTC_ORIGIN_PRIMARY_MEMORY);

        if (DEM_CLEAR_PENDING == returnValue)
        {
            /* If the return value is DEM_CLEAR_PENDING, until completion
            Xxx_ClearDTC Operation must be called.*/
        }
        else
        {
            RequestClearDTC = 0;
        }
    }
}
```

8.6 NvM Block Length Validation Support

Verify that the NvBlockLength setting of the NvM Block used in Dem is valid.

Structure variables Dem_EventStatusNvRamData, Dem_NonVolatileData,
The size of Dem_PrimaryEventMemory[n], Dem_UserDefinedEventMemory [n], etc. varies according to the Dem setting.
Therefore, the length of the corresponding NvM block must also be changed.

In Dem, if the actual size of the structure variable and the length of the NvM block corresponding to the variable do not match, a compiler error occurs.

The user should modify NvBlockLength by referring to the code [Dem_Cfg.c] below.

```

/*****
 * Checks the length of th NvM Block NvMBlock_ManagementBlock
 * Configured NvBlockLength : 10
 * Valid NvBlockLength      : 10
 *****/
DEM_STATIC_ASSERT(offsetof(Dem_GenericNvRamDataType, endOfStructure) == 10, Invalid_NvBlockLength);
/*****
 * Checks the length of th NvM Block NvMBlock_EventStatusNvRamBlock
 * Configured NvBlockLength : 412
 * Valid NvBlockLength      : 411
 *****/
DEM_STATIC_ASSERT(offsetof(Dem_EventStatusNvRamDataType, endOfStructure) == 412, Invalid_NvBlockLength);
/*****
 * Checks the length of th NvM Block NvMBlock_PrimaryEventMemory0
 * Configured NvBlockLength : 18
 * Valid NvBlockLength      : 15
 *****/
DEM_STATIC_ASSERT(offsetof(Dem_EventMemoryEntryType, endOfStructure) == 18, Invalid_NvBlockLength);

```

* Configured NvBlockLength: 10

-> It means the currently set length.

* Valid NvBlockLength: 10

-> It means the size of the actual structure variable. NvBlockLength must be modified according to this value.

[Valid NvBlockLength] The size suggested in may be different from the map file. This is because the following calculation method is used to cope with various MCUs and compilers.

```

/*****
 * Numeration
 *
 * [Example]
 *
 * struct s2 {
 *     uint32 a;
 *     uint16 b;
 *     uint8  c[2];
 *     uint8  end; 'end' of structure s2 uses to calculate the length.
 * } x;
 *
 * The following diagram shows how the compiler will allocate x using
 * its 4 bytes alignment.
 *
 * +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
 * | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
 * +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
 * |      a      |          b          | c[0] | c[1] | end | padding bytes(*1) |
 * +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
 * |      real length      |          not used bytes          |
 * +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
 *
 * *1) Depending on the compiler and the machine, Padding bytes may vary.
 *
 * real length of s2 = offsetof(struct s2, end) = 8.
 * Note : This value differs from the value of a map file.
 *****/

```

8.7 Recommendations for NvM Block

8.7.1 Re-execute BswM Harmonize when changing NvM ReadAll/WriteAll properties in NvM settings

When the ReadAll/WriteAll properties of the NvM Block used by Dem are changed, BswM Harmonize must be re-executed.

8.7.2 NvM ReadAll/WriteAll function recommended

Dem recommends using ReadAll/WriteAll for all NvM Blocks used.

8.7.3 NvM CRC, Redundant block recommended

In Dem, it is recommended to use CRC and redundant data blocks for all NvM blocks used.

If the ECU power is cut off before NvM writes all data to NvRam, the validity of these data cannot be guaranteed.

In preparation for this, it is recommended to use redundant data block.

It is also recommended to use CRC to verify the validity of data.

8.8 Notes on NvM Block

8.8.1 Cautions when using NvM ReadAll function

When using ReadAll, setting ReadAll for only some blocks may increase the startup time, so you must set it for all blocks.

8.8.2 Cautions when setting Event Memory NvM

NvRam Block Id set in Dem Event Memory can be saved and read in NvRam normally only when Ram Block Data Address is set with the same Event Memory in NvM setting.

8.9 J1979-2/J1979-3

When using J1979-2/J1979-3 function, Dem OBD-related functions should be configured. (DemOBDSupport, DemGeneralOBD, DemObdDtc, etc)