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1 Introduction and Functional Overview

This specification describes the functionality, API, and the configuration of the AUTOSAR Basic Software Module [SAE J1939 Functional Safety Communication Protocol](#).

This module provides services for initialization, [Safety Data Group](#) (SDG) operations, [Safety Header Message/Safety Data Message](#) processing, time supervision between producer and consumer application [SWCs](#), and error management per [SAE J1939-76](#) specification.

Please note: Throughout this specification, the abbreviation [SDG](#) refers to an [SAE J1939-76 Safety Data Group](#) in the remainder of this document, please don't confuse this abbreviation with the special data group described in the [1, CP TPS System Template].

The [SAE J1939 Functional Safety Communication Protocol](#) belongs to the service layer and its location is shown in [Figure 1.1](#).

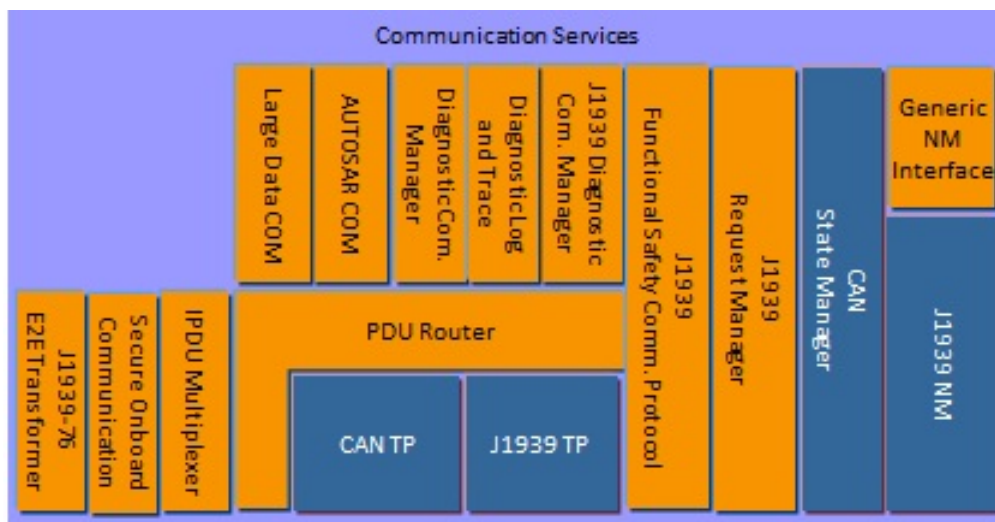


Figure 1.1: J1939 Functional Safety Communication Protocol

The [E2E PROFILE_76](#) has been introduced for [E2E](#) protection of [J1939](#) messages. A description of this new profile is provided in the [E2E Protocol](#).

1.1 Functional Safety Communication Protocol

1.1.1 Functional Safety for Non-Segmented SAE J1939 Messages

[SAE J1939-76](#) defines a message that allows applications to satisfy functional safety requirements depending on the level of functional safety needed. This message is the [Safety Header Message](#) ([SHM](#), [PGN](#) = 0x0E00), and it is paired with an ordinary [SAE J1939](#) message that requires functional safety coverage, referred to as the [Safety Data Message](#) ([SDM](#)). The [SDM](#) can have at maximum 8 bytes of data. The [SHM](#)

includes the sequence number, CRC, and enough information from the CAN ID to associate it with the [SDM](#). Together, the [SHM](#) and [SDM](#) are referred to as the [Safety Data Group](#) ([SDG](#)).

The transmission of the [SHM](#) precedes the transmission of the associated [SDM](#). The [SDM](#) must be transmitted within a specified duration ([SRVT](#)) of the transmission of the associated [SHM](#). Network nodes that receive the [SDG](#) will validate the data in the [SHM](#) before using the data in the [SDM](#). Network nodes that are not interested in checking the functional safety for the [SDM](#) can ignore the [SHM](#) and still process the [SDM](#).

The [SDM](#) message corresponds to the [J1939ProtectedIPdu](#) in the [1, CP TPS System Template], which contains the payload of the specific [PGN](#) that requires protection. The [ISignalIPdu](#) linked to a [J1939ProtectedIPdu](#) in the [1, CP TPS System Template] corresponds to the [J1939-76 SDG](#), and contains both, the parts of the [SHM](#) provided by the upper layer of [SAE J1939 Functional Safety Communication Protocol](#) (more specifically: the [E2E](#) protection layers) and the payload of the [SDM](#) provided by the application. After derivation, the [SDG](#) is represented by a [ComIPdu](#) that is referenced by [J1939FscpSdgRxPdu.J1939FscpSdgRxPduRef](#) or [J1939FscpSdgTxPdu.J1939FscpSdgTxPduRef](#) via a global [Pdu](#).

[Figure 1.2](#) shows the layout of the [ISignalIPdu](#) or [ComIPdu](#), and how it maps to the [SDG](#).

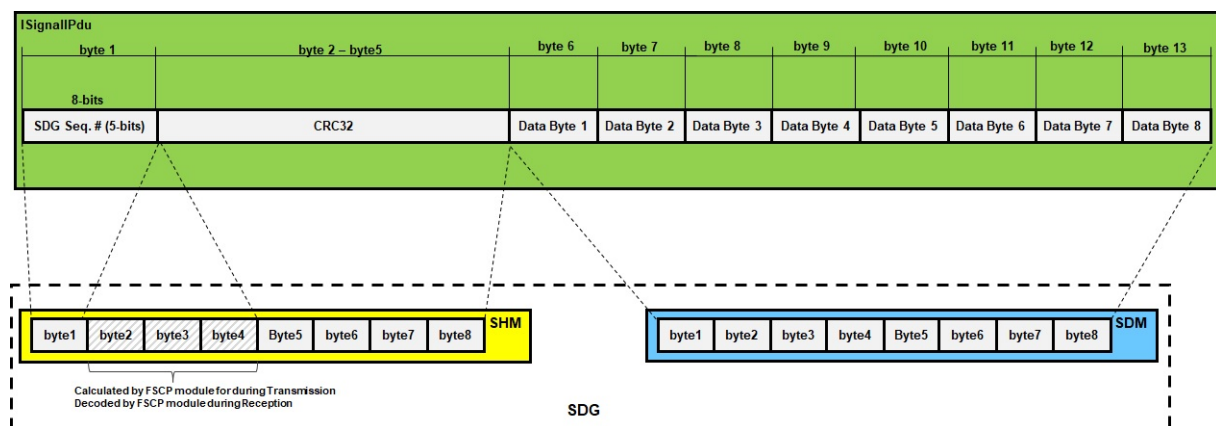


Figure 1.2: ComIPdu Layout

[PGN](#) protection is performed by using the [E2E Transformer](#), which in the case of CAN signals requires the introduction of [ISignalGroups](#) to represent [SAE J1939](#) messages. Additionally, the [COM Based Transformer](#) is required for serialization which is the first in the transformation chain. The following is an example of how the [I-PDU](#) layout of [J1939 PG EEC1](#) must be modeled for [E2E](#) protection to meet the [SAE J1939-76](#) specification.

See [Chapter 1.1.1.1](#) for an example.

The [PGN](#) must be modeled as an [ISignalGroup](#) which is mapped to a data element of a Sender-Receiver interface of data type implementation record. In this case, the transformer chain must follow this order:

1. COM Based Transformer
2. E2E Transformer

Please note that CRC calculation is performed by the CRC Library, which is called by the E2E Library, which in turn is used by the E2E Transformer. For SAE J1939-76, CRC calculation uses the whole message (8 bytes or less).

1.1.1.1 Example 1

The PGN F004 (EEC1) defines the following signals:

Byte #	SP Label	SP Length (bits)
1	Engine Torque Mode	4
	Actual Engine - Percent Torque (Fractional)	4
2	Driver's Demand Engine - Percent Torque	8
3	Actual Engine - Percent Torque	8
4-5	Engine Speed	16
6	Source Address of Controlling Device for Engine Control	8
7	Engine Starter Mode	4
	reserved	4
8	Engine Demand - Percent Torque	8

Table 1.1: EEC1 IPdu Signal Layout

1.1.2 SAE J1939 Functional Safety Protocol BSW Module

The SAE J1939 Functional Safety Communication Protocol handles transmitting and receiving SDGs (both SHMs and SDMs). For transmitted messages that require functional safety protection, the SAE J1939 Functional Safety Communication Protocol determines the values of the data fields in the SHM for the associated SDM. For received SDGs, the SAE J1939 Functional Safety Communication Protocol validates the data fields in the SHM of a received SDG and reports the status to the data fields in the SDM. In other words, the module splits the SDG during transmission and combines the SHM and SDM during reception.

1.2 SAE J1939 Terminology

The terminology of J1939 differs noticeably from the usual AUTOSAR terminology. For consistency reasons, this introduction used the terms of the J1939 specification, while the remainder of this specification will use terms that are more common within AUTOSAR:

- 'I-PDU' replaces 'parameter group'

- 'ISignalIPdu' describes the data of the [SDG](#) ([SHM](#) + [SDM](#))
- 'J1939ProtectedIPdu' describes the data of the [SDM](#)
- 'ISignalGroup' describes the set of [parameters](#) that need to be protected
- 'ISignal' describes a single [parameter](#)

2 Acronyms and Abbreviations

The glossary below includes terms and acronyms and abbreviations relevant to the [SAE J1939 Functional Safety Communication Protocol](#) module that are not included in the [2, AUTOSAR Glossary].

Acronym / Abbreviation	Description
BSW	Basic Software (module)
CAN ID	CAN identifier according to [3, ISO 11898] with 11 or 29 bits, the latter being defined by [4, SAE J1939-21] to consist of Priority , EDP , DP , PDUF , PDUS/DA , and SA .
CanIf	CAN Interface, see [5, CP SWS CAN Interface]
COM	Communication module, see [6, CP SWS COM]
ComXf	COM Based Transformer, see [7, CP SWS COM Based Transformer]
CRC	Cyclic Redundancy Check, a very common check sum
CrcLib	CRC Library, see [8, CP SWS CRC Library]
DA	Destination Address, part of the 29 bit CAN identifier of SAE J1939 messages
DEM	Diagnostic Event Manager, stores DTCs containing diagnostic events and test results, and associated information, see [9, CP SWS Diagnostic Event Manager]
DET	Default Error Tracer, supports development and runtime error reporting, see [10, CP SWS Default Error Tracer]
DP	Data Page, the most significant bit (MSB) of the 18 bit PGN
E2E	End-to-End protection, a safety concept which can be used to achieve higher (A)SIL levels
E2ELib	E2E Library, see [11, CP SWS E2E Library]
E2EProtocol	E2E Protocol, see [12, FO PRS E2E Protocol]
E2EXf	E2E Transformer, see [13, CP SWS E2E Transformer]
EcuM	ECU State Manager, see [14, CP SWS ECU State Manager]
EDP	Extended Data Page, the second bit (after MSB) of the 18 bit PGN
J1939Fscp	SAE J1939 Functional Safety Communication Protocol (this module)
MetaData	Meta data transferred alongside a PDU, consisting of a set of meta data items
MetaDataItem	A single item of meta data of defined type and size
Parameter	Parameter, SAE J1939 term for a signal, including defined scale, limits, offset, and physical unit
Parameter Group	A Parameter Group is a message of the SAE J1939 application layer. Each Parameter Group contains several Parameters (signals), and is uniquely identified by the PGN .
PDU	Protocol Data Unit, a message transferred between the layers of the AUTOSAR stack, also known as I-PDU
PDU1	J1939 PDU Type 1, this kind of PG can be sent to a specific destination address
PDU2	J1939 PDU Type 2, this kind of PG can only be sent as broadcast
PDUF	PDU Format, the middle byte of the 18 bit PGN which identifies the PG and determines the layout (PDU1/PDU2) of the PGN
PduR	PDU Router, see [15, CP SWS PDU Router]
PDUS	PDU Specific, the lower byte of the 18 bit PGN which further identifies PDU2 PG which cannot have a destination address
PG	Parameter Group , SAE J1939 term for a specific message layout
PGN	Parameter Group Number, unique identifier (18 bits: EDP , DP , PDUF , PDUS) of an SAE J1939 Parameter Group that is contained in the payload of many J1939 protocol messages and in the 29bit CAN identifier of SAE J1939 messages.
PRI	Priority, part of the 29 bit identifier of SAE J1939 messages





Acronym / Abbreviation	Description
RTE	AUTOSAR Runtime Environment, handles application SW-Cs and interfaces between basic software and the application, see [16, SWS RTE]
SA	Source Address, part of the 29 bit identifier of SAE J1939 messages
SAE	Society of Automotive Engineers (in charge of J1939 specification)
SAE J1939	Serial control and communications standard for heavy duty vehicle networks created by the SAE , see [17, SAE J1939]
SAE J1939-21	Data link layer for CAN 2.0 created by the SAE , see [4, SAE J1939-21]
SAE J1939-76	Functional safety communications protocol layer created by the SAE , see [18, SAE J1939-76]
SchM	Basic Software Schedule Manager, part of the RTE
SCT	Safety Cycle Time, which passes between two instances of the same SDG according to SAE J1939-76
SDG	SAE J1939-76 Safety Data Group, consisting of an SHM followed by an SDM
SDM	SAE J1939-76 Safety Data Message, part of an SDG
SHM	SAE J1939-76 Safety Header Message, part of an SDG
SNA	Signal Not Available, all bits set to 1 in SAE J1939 PGs/Parameters
SPN	Suspect Parameter Number, unique identifier of an SAE J1939 Parameter
SRVT	Safety-Relevant Validation Time, which passes between the SHM and the SDM of an SDG according to SAE J1939-76
SW-C	AUTOSAR Software Component (of the Application)

Table 2.1: Acronyms and Abbreviations

3 Related Documentation

3.1 Input Documents & Related Standards and Norms

- [1] System Template
AUTOSAR_CP_TPS_SystemTemplate
- [2] Glossary
AUTOSAR_FO_TR_Glossary
- [3] ISO 11898-1:2015 – Road vehicles – Controller area network (CAN)
- [4] SAE J1939-21 Data Link Layer
- [5] Specification of CAN Interface
AUTOSAR_CP_SWS_CANInterface
- [6] Specification of Communication
AUTOSAR_CP_SWS_COM
- [7] Specification of COM Based Transformer
AUTOSAR_CP_SWS_COMBasedTransformer
- [8] Specification of CRC Library
AUTOSAR_CP_SWS_CRCLibrary
- [9] Specification of Diagnostic Event Manager
AUTOSAR_CP_SWS_DiagnosticEventManager
- [10] Specification of Default Error Tracer
AUTOSAR_CP_SWS_DefaultErrorTracer
- [11] Specification of SW-C End-to-End Communication Protection Library
AUTOSAR_CP_SWS_E2ELibrary
- [12] E2E Protocol Specification
AUTOSAR_FO_PRS_E2EProtocol
- [13] Specification of Module E2E Transformer
AUTOSAR_CP_SWS_E2ETransformer
- [14] Specification of ECU State Manager
AUTOSAR_CP_SWS_ECUSTateManager
- [15] Specification of PDU Router
AUTOSAR_CP_SWS_PDURouter
- [16] Specification of RTE Software
AUTOSAR_CP_SWS_RTE
- [17] SAE J1939 – Serial Control and Communications Heavy Duty Vehicle Network
- [18] SAE J1939-76 Functional Safety Communications Protocol

- [19] General Specification of Basic Software Modules
AUTOSAR_CP_SWS_BSWGeneral
- [20] Layered Software Architecture
AUTOSAR_CP_EXP_LayeredSoftwareArchitecture
- [21] Requirements on BSW Modules for SAE J1939
AUTOSAR_CP_RS_SAEJ1939
- [22] General Requirements on Basic Software Modules
AUTOSAR_CP_RS_BSWGeneral
- [23] Specification of Communication Stack Types
AUTOSAR_CP_SWS_CommunicationStackTypes
- [24] Specification of Standard Types
AUTOSAR_CP_SWS_StandardTypes

3.2 Related Specification

AUTOSAR provides a General Specification on [Basic Software](#) modules [[19](#), CP SWS BSW General], which is also valid for [SAE J1939 Functional Safety Communication Protocol](#).

Thus, the specification [[19](#), CP SWS BSW General] shall be considered as additional and required specification for [SAE J1939 Functional Safety Communication Protocol](#).

4 Constraints and Assumptions

4.1 Limitations

The [SAE J1939 Functional Safety Communication Protocol](#) is specified in accordance with [SAE J1939-76](#), which is able to satisfy the functional safety standards IEC 61508-2:2010 (up to SIL 3) and the industrial safety communication standard IEC 61784-3:2016. It is up to the system designer to perform the analysis and determine if the [SAE J1939 Functional Safety Communication Protocol](#), the [E2E](#) protection layers and their integration into the AUTOSAR architecture satisfy the functional safety goals. Some limitations are described in sections 4.3 “Limitations” and 4.4 “SAE J1939 PG Constraints” of [SAE J1939-76](#).

Please note that due to the architecture of AUTOSAR, the [SAE J1939 Functional Safety Communication Protocol](#) can only detect a subset of the IEC 61784-3 Communication Errors listed in table A1 in appendix A.1 “Qualitative Analysis” of [SAE J1939-76](#). The majority of the communication errors are detected by the [E2E](#) protection layers, and only these can be reported directly to the application alongside the data as overlayed errors.

The following communication errors are detected directly by the [SAE J1939 Functional Safety Communication Protocol](#):

Unacceptable Delay is detected only for the [SRVT](#), and is reported via runtime error [J1939FSCP_E_TIMEOUT_RX_SRVT](#). The [SCT](#) has to be measured and supervised directly by the application.

Addressing may be reported via runtime errors [J1939FSCP_E_UNKNOWN_PGN](#), [J1939FSCP_E_NO_SDM_RECEIVED](#), or [J1939FSCP_E_NO_SHM_RECEIVED](#), or may result in silently dropping a message, depending on the actually observed problem.

An AUTOSAR ECU may also entirely ignore the [SHM](#) by configuring the [SDM](#) as ordinary communication message.

4.2 Applicability to Car Domains

[J1939](#) is developed by the [SAE](#) as a standard for heavy-duty on-highway, farming, and construction vehicles. It is not used in passenger cars.

5 Dependencies to Other Modules

The [20, EXP Layered Software Architecture] shows an overview of the neighboring modules of the [SAE J1939 Functional Safety Communication Protocol](#).

The [SAE J1939 Functional Safety Communication Protocol](#) module ([J1939Fscp](#)) has direct interfaces and/or configuration dependencies towards the [PDU Router](#) ([PduR](#)) and the [Default Error Tracer](#) ([DET](#)). Besides these, there are also indirect dependencies towards the [Communication](#) ([COM](#)) and the [CAN Inter-face](#) ([CanIf](#)).

The [SAE J1939 Functional Safety Communication Protocol](#) module includes header files of the [PDU Router](#) and the [Default Error Tracer](#).

5.1 File Structure

5.1.1 Code File Structure

For details, refer to [19, SWS BSW General] 5.1.6 “*Code file structure*”.

5.1.2 Header File Structure

For details, refer to [19, SWS BSW General] 5.1.7 “*Header file structure*”.

6 Requirements Tracing

The following tables reference the requirements specified in [21, RS SAE J1939] (Requirements on BSW Modules for SAE J1939) and [22, RS BSW General] and links to the fulfillment of these.

Requirement	Description	Satisfied by
[SRS_BSW_00101]	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	[CP_SWS_J1939Fscp_00006] [CP_SWS_J1939Fscp_00008]
[SRS_BSW_00327]	Error values naming convention	[CP_SWS_J1939Fscp_90012] [CP_SWS_J1939Fscp_90013]
[SRS_BSW_00336]	Basic SW module shall be able to shutdown	[CP_SWS_J1939Fscp_00007]
[SRS_BSW_00337]	Classification of development errors	[CP_SWS_J1939Fscp_90012]
[SRS_BSW_00385]	List possible error notifications	[CP_SWS_J1939Fscp_90012] [CP_SWS_J1939Fscp_90013]
[SRS_BSW_00386]	The BSW shall specify the configuration and conditions for detecting an error	[CP_SWS_J1939Fscp_00002] [CP_SWS_J1939Fscp_00027]
[SRS_BSW_00407]	Each BSW module shall provide a function to read out the version information of a dedicated module implementation	[CP_SWS_J1939Fscp_90007]
[SRS_BSW_00441]	Naming convention for type, macro and function	[CP_SWS_J1939Fscp_90012] [CP_SWS_J1939Fscp_90013]
[SRS_BSW_00452]	Classification of runtime errors	[CP_SWS_J1939Fscp_90013]
[SRS_BSW_00478]	Timing limits of main functions	[CP_SWS_J1939Fscp_00001] [CP_SWS_J1939Fscp_00013]
[SRS_J1939_00049]	J1939 Modules shall support Meta Data	[CP_SWS_J1939Fscp_00014] [CP_SWS_J1939Fscp_00028]
[SRS_J1939_00057]	SDG Transmission	[CP_SWS_J1939Fscp_00003] [CP_SWS_J1939Fscp_00010] [CP_SWS_J1939Fscp_00011] [CP_SWS_J1939Fscp_00014] [CP_SWS_J1939Fscp_00015] [CP_SWS_J1939Fscp_00016] [CP_SWS_J1939Fscp_00017] [CP_SWS_J1939Fscp_00027] [CP_SWS_J1939Fscp_00028]
[SRS_J1939_00058]	SDG Reception	[CP_SWS_J1939Fscp_00004] [CP_SWS_J1939Fscp_00005] [CP_SWS_J1939Fscp_00012] [CP_SWS_J1939Fscp_00020] [CP_SWS_J1939Fscp_00021] [CP_SWS_J1939Fscp_00022] [CP_SWS_J1939Fscp_00023] [CP_SWS_J1939Fscp_00024] [CP_SWS_J1939Fscp_00025] [CP_SWS_J1939Fscp_00026]





Requirement	Description	Satisfied by
[SRS_J1939_00059]	Transmission Timeout Monitoring	[CP_SWS_J1939Fscp_00003] [CP_SWS_J1939Fscp_00009] [CP_SWS_J1939Fscp_00011] [CP_SWS_J1939Fscp_00013] [CP_SWS_J1939Fscp_00015] [CP_SWS_J1939Fscp_00016] [CP_SWS_J1939Fscp_00017] [CP_SWS_J1939Fscp_00018]
[SRS_J1939_00060]	Reception Timeout Monitoring	[CP_SWS_J1939Fscp_00004] [CP_SWS_J1939Fscp_00009] [CP_SWS_J1939Fscp_00012] [CP_SWS_J1939Fscp_00013] [CP_SWS_J1939Fscp_00021] [CP_SWS_J1939Fscp_00022]
[SRS_J1939_00061]	Ignoring unknown SHMs	[CP_SWS_J1939Fscp_00012] [CP_SWS_J1939Fscp_00025]
[SRS_J1939_00062]	SDG with Invalid Length	[CP_SWS_J1939Fscp_00027]
[SRS_J1939_00063]	SRVT Timeout during Transmission	[CP_SWS_J1939Fscp_00018]
[SRS_J1939_00064]	SRVT Timeout during Reception	[CP_SWS_J1939Fscp_00022]
[SRS_J1939_00065]	Reception of Consecutive SHMs	[CP_SWS_J1939Fscp_00023]
[SRS_J1939_00066]	Reception of Consecutive SDMs	[CP_SWS_J1939Fscp_00024]

Table 6.1: Requirements Tracing

7 Functional Specification

This chapter defines the behavior of the [J1939 Functional Safety Communication Protocol](#) module ([J1939Fscp](#)). The API of the module is defined in [Chapter 8](#), while the configuration is defined in [Chapter 10](#).

7.1 Overview

The [J1939Fscp](#) is responsible for processing the transmission request from the application (through [COM](#) and [PduR](#)) of the [SDG](#) (derived from an [ISignalIPdu](#)), extract the [SHM](#) (automatically derived) and [SDM](#) (derived from the [J1939ProtectedIPdu](#)), and ensure these [PDUs](#) are transmitted within the correct time separation ([SRVT](#)) between [SHM](#) and [SDM](#), per [SAE J1939-76](#). The transmission path is shown in [Figure 7.1](#).

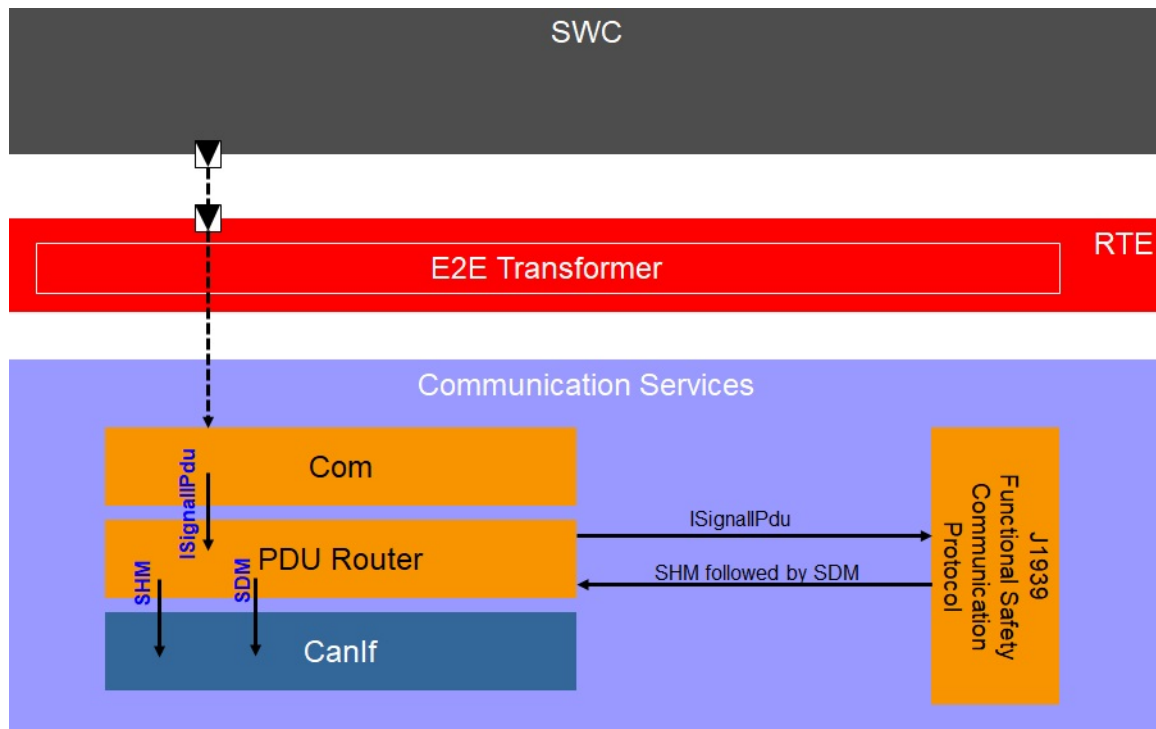


Figure 7.1: Transmission Path for SDG Processing

Prior the transmission of the [SHM](#) and [SDM](#) messages, [E2E](#) protection calculations are performed by the [E2E Library](#). The [J1939Fscp](#) uses the result from the [E2E Library](#) and makes sure the [SHM](#) is properly formatted and passed to the lower layers.

Similarly, on the reception side, the [J1939Fscp](#) receives the [SHM](#) and [SDM](#), assembles the [SDG](#), and passes it to the upper layers for further processing. The reception path is shown in [Figure 7.2](#).

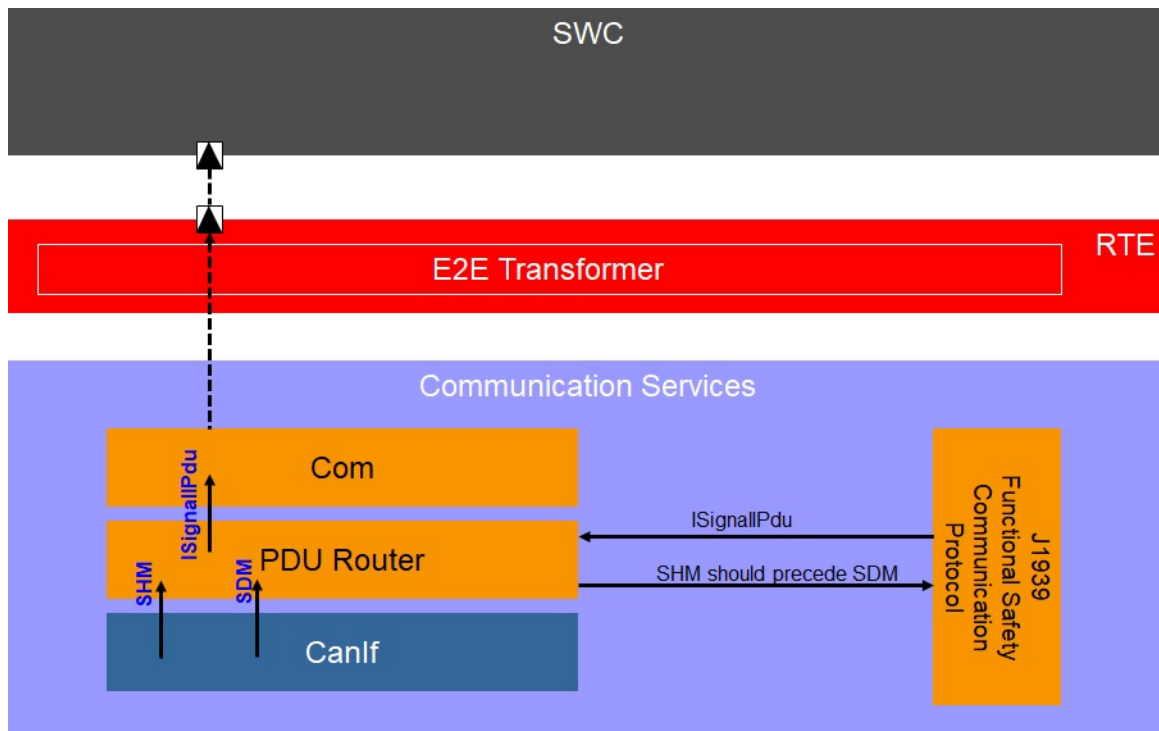


Figure 7.2: Reception Path for SDG Processing

The **SDG** exchanged with the upper layers contains the protection data for the **SHM** followed by the **PGN** data for the the **SDM** (see [Figure 1.2](#)). The protection data contains exactly 5 bytes, consisting of 1 byte for the sequence number followed by 4 bytes of the **CRC** in little endian byte order. The **PGN** data contains the data provided by the application, and may consist of 1 to 8 bytes.

[CP_SWS_J1939Fscp_00003] SRVT Transmission Monitoring

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#), [SRS_J1939_00059](#)

[During message transmission, the **J1939Fscp** shall ensure that the time separation (**SRVT**) between **SHM** and **SDM** meets the timing requirements per [SAE J1939-76](#).]

[CP_SWS_J1939Fscp_00004] SRVT Reception Monitoring

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00060](#)

[During message reception, the **J1939Fscp** shall ensure that the time separation (**SRVT**) between **SHM** and **SDM** meets the timing requirements per [SAE J1939-76](#).]

[CP_SWS_J1939Fscp_00005] Reception of the Same PGN from Multiple Sources

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#)

[The **J1939Fscp** shall be capable to handle receiving **SDMs** from multiple **source addresses** (same **PGN**, e.g., **TSC1**), and shall ensure that **SRVT** requirements are met for all of the received **SDMs**.]

7.2 Module Handling

This section contains description of auxiliary functionality of the [J1939Fscp](#).

7.2.1 Initialization

The [J1939Fscp](#) is initialized via [J1939Fscp_Init](#), and de-initialized via [J1939Fscp_DeInit](#). Except for [J1939Fscp_GetVersionInfo](#) and [J1939Fscp_Init](#), the API functions of the [J1939Fscp](#) may only be called after the module has been properly initialized.

[CP_SWS_J1939Fscp_00006] Module Initialization

Status: DRAFT

Upstream requirements: [SRS_BSW_00101](#)

[A call to [J1939Fscp_Init](#) initializes all internal variables and sets the [J1939Fscp](#) to the initialized state.]

[CP_SWS_J1939Fscp_00007] Module Shutdown

Status: DRAFT

Upstream requirements: [SRS_BSW_00336](#)

[A call to [J1939Fscp_DeInit](#) sets the [J1939Fscp](#) back to the uninitialized state.]

[CP_SWS_J1939Fscp_00008] Re-initialization

Status: DRAFT

Upstream requirements: [SRS_BSW_00101](#)

[When [J1939Fscp_Init](#) is called in initialized state, the [J1939Fscp](#) shall not re-initialize its internal variables. It shall instead call `Det_ReportError` with the error code [J1939FSCP_E_REINIT](#) if `DET` reporting is enabled (see [J1939FscpDevErrorDetect](#)).]

7.2.2 Timing Related Functionality

To be able to measure times, the [J1939Fscp](#) is triggered cyclically via the [J1939Fscp_MainFunction](#).

[CP_SWS_J1939Fscp_00009] Main Function Usage

Status: DRAFT

Upstream requirements: [SRS_J1939_00059](#), [SRS_J1939_00060](#)

[The [J1939Fscp](#) shall use the [J1939Fscp_MainFunction](#) for timing related purposes.]

7.3 Message Handling

7.3.1 Message Transmission

The `PduR` calls `J1939Fscp_Transmit` to initiate the transmission of each `SDG`. After transmission of the corresponding `SHM` and `SDM`, the `J1939Fscp` reports the failure or success back to `PduR` with `PduR_J1939FscpTxConfirmation`. See also [Figure 7.1](#) and [Figure 9.1](#).

[CP_SWS_J1939Fscp_00010] SDG Decomposition and SHM Transmission

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#)

[When `J1939Fscp_Transmit` is called, the `J1939Fscp` shall split the provided `SDG` data into the `SHM` parts and the `SDM`. The `SDM` data shall be stored, while the `SHM` shall be constructed as described in [\[CP_SWS_J1939Fscp_00014\]](#). Finally, the `J1939Fscp` shall call `PduR_J1939FscpTransmit` to transmit the `SHM`.]

[CP_SWS_J1939Fscp_00014] SHM Composition: CAN ID

Status: DRAFT

Upstream requirements: [SRS_J1939_00049](#), [SRS_J1939_00057](#)

[The `J1939Fscp` shall construct the `SHM` from the `SDG` data provided via `J1939Fscp_Transmit` and the `CAN ID` parts that are reflected in the `SHM` layout. The `CAN ID` parts shall be taken from the `CanIfTxPduCfg.CanIfTxPduCanId` that is referenced indirectly via the global `PDU` by `J1939FscpSdmTxPduRef`, and from the `MetaDataItem` of type `CAN_ID_32`, if parts of the `CanIfTxPduCanId` are declared as variable by a `CanIfTxPduCfg.CanIfTxPduCanIdMask`.]

[CP_SWS_J1939Fscp_00028] SHM Composition: Priority

Status: DRAFT

Upstream requirements: [SRS_J1939_00049](#), [SRS_J1939_00057](#)

[For the transmission of the `SHM`, the `J1939Fscp` shall determine the `Priority` in the following way:

1. The value of `J1939FscpShmTxPriority`, if this is configured.
2. A value lower or equal to the `Priority` provided via a `MetaDataItem` of type `CAN_ID_32` of the global `PDU` referenced via `J1939FscpSdgTxPduRef` if that is available.
3. A value lower or equal to the `Priority` configured for the `CAN ID` of the `SDM` otherwise.

]

Please refer to [\[18, SAE J1939-76\]](#) section 6.1 “Safety Header Message Definition” for the layout of the `SHM`.

[CP_SWS_J1939Fscp_00011] SDM Transmission

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#), [SRS_J1939_00059](#)

[When [J1939Fscp_TxConfirmation](#) is called for the successful transmission of the [SHM](#), the [J1939Fscp](#) shall start the [SRVT](#) timer with [J1939FscpTxSrvt](#) and call [PduR_J1939FscpTransmit](#) to transmit the stored [SDM](#).]

[CP_SWS_J1939Fscp_00015] SDM Retry

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#), [SRS_J1939_00059](#)

[When [PduR_J1939FscpTransmit](#) returns an error for the [SDM](#) transmission, and the [SRVT](#) timer is not yet expired, the [J1939Fscp](#) shall retry the transmission of the [SDM](#).]

[CP_SWS_J1939Fscp_00016] Successful SDG Confirmation

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#), [SRS_J1939_00059](#)

[When [J1939Fscp_TxConfirmation](#) is called for the successful transmission of the [SDM](#), the [J1939Fscp](#) shall stop the [SRVT](#) timer and call [PduR_J1939FscpTxConfirmation](#) to notify the [PduR](#) of the successful transmission of the [SDG](#).]

[CP_SWS_J1939Fscp_00017] Failed SDG Confirmation

Status: DRAFT

Upstream requirements: [SRS_J1939_00057](#), [SRS_J1939_00059](#)

[When [PduR_J1939FscpTransmit](#) returns an error for the [SHM](#) transmission or receives a negative transmission confirmation for either [SHM](#) or [SDM](#), or when the [SRVT](#) timer expires, the [J1939Fscp](#) shall call [PduR_J1939FscpTxConfirmation](#) with [E_NOT_OK](#) to notify the [PduR](#) of the failed transmission of the [SDG](#).]

[CP_SWS_J1939Fscp_00018] SRVT Timeout During Transmission

Status: DRAFT

Upstream requirements: [SRS_J1939_00059](#), [SRS_J1939_00063](#)

[When the [SRVT](#) timer expires, the [J1939Fscp](#) shall additionally report the runtime error [J1939FSCP_E_TIMEOUT_TX_SRVT](#) to the [DET](#).]

7.3.2 Message Reception

The [PduR](#) calls [J1939Fscp_RxIndication](#) to notify [J1939Fscp](#) of the reception of [SHM](#) and [SDM](#) PDUs. See also [Figure 7.2](#) and [Figure 9.2](#).

[CP_SWS_J1939Fscp_00012] SHM Reception

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00060](#), [SRS_J1939_00061](#)

[When [J1939Fscp_RxIndication](#) is called for an [SHM](#), the [J1939Fscp](#) shall compare the received [SDG PGN](#) against the configured [SDMs](#). If a suitable [SDM](#) is found, the [J1939Fscp](#) shall store the [SA](#) and [DA](#) (the latter only if the [PGN](#) is of type [PDU1](#)), the [CRC](#) and the sequence number, and start the [SRVT](#) timer with [J1939FscpRxSrvt](#).]

Please refer to [[18](#), SAE J1939-76] section 6.1 “Safety Header Message Definition” for the layout of the [SHM](#).

[CP_SWS_J1939Fscp_00021] SDM Reception

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00060](#)

[When [J1939Fscp_RxIndication](#) is called for an [SDM](#) that matches the data stored from a previous [SHM](#) reception, the [J1939Fscp](#) shall stop the [SRVT](#) timer, assemble the [SDG](#) data as described in [[CP_SWS_J1939Fscp_00026](#)], and call `PduR_J1939FscpRxIndication` to forward the [SDG](#) to the [PduR](#).]

[CP_SWS_J1939Fscp_00026] SDG Composition

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#)

[The [J1939Fscp](#) shall construct the [SDG](#) data from the received [SHM](#) and [SDM](#) by placing the sequence number in the first byte, the [CRC](#) in the following five bytes, and the [SDM](#) data in the remaining bytes of the [PDU](#) referenced via [J1939FscpSdgRxPduRef](#).]

[CP_SWS_J1939Fscp_00022] SRVT Timeout During Reception

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00060](#), [SRS_J1939_00064](#)

[When the [SRVT](#) timer expires, the [J1939Fscp](#) shall stop the [SDGs](#) reception and report the runtime error [J1939FSCP_E_TIMEOUT_RX_SRVT](#) to the [DET](#).]

[CP_SWS_J1939Fscp_00025] Unknown PGN

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00061](#)

[When [J1939Fscp_RxIndication](#) is called for an [SHM](#) where the received [SDG PGN](#) does not match any configured [SDMs](#), the [J1939Fscp](#) shall report the runtime error [J1939FSCP_E_UNKNOWN_PGN](#) to the [DET](#) and drop the received [SHM](#).]

[CP_SWS_J1939Fscp_00023] Missing SDM

Status: DRAFT

Upstream requirements: [SRS_J1939_00058](#), [SRS_J1939_00065](#)

[When [J1939Fscp_RxIndication](#) is called for an [SHM](#) which matches the data stored from a previous [SHM](#) reception, the [J1939Fscp](#) shall stop the [SDGs](#) reception,

report the runtime error `J1939FSCP_E_NO_SDM_RECEIVED` to the `DET`, and start a new `SDGs` reception as described in `[CP_SWS_J1939Fscp_00012]`.

[CP_SWS_J1939Fscp_00024] Missing SHM

Status: DRAFT

Upstream requirements: `SRS_J1939_00058`, `SRS_J1939_00066`

[When `J1939Fscp_RxIndication` is called for an `SDM` which does not match the data stored from a previous `SHM` reception, the `J1939Fscp` shall report the runtime error `J1939FSCP_E_NO_SHM_RECEIVED` to the `DET` and drop the received `SDM`.]

[CP_SWS_J1939Fscp_00020] Receiving Parallel SDGs with Same PGN

Status: DRAFT

Upstream requirements: `SRS_J1939_00058`

[The number of `SDGs` bound to the same `J1939FscpRxPg` that can be handled in parallel by the `J1939Fscp` shall be limited by `J1939FscpRxInstances`.]

7.3.3 Timing Supervision

`J1939Fscp` monitors the `SRVT` on transmission and reception side, the effects are described in the corresponding sections above.

[CP_SWS_J1939Fscp_00013] SRVT Timeout Monitoring

Status: DRAFT

Upstream requirements: `SRS_BSW_00478`, `SRS_J1939_00059`, `SRS_J1939_00060`

[The `J1939Fscp` shall use `J1939Fscp_MainFunction` that is triggered with the configured `J1939FscpMainFunctionPeriod` to monitor the maximum time separation (`SRVT`) between the `SHM` and `SDM` messages in accordance with the `SAE J1939-76` specification.]

7.4 Error Classification

Chapter [19, SWS BSW General] 7.2 “Error Handling” describes the error handling of the `Basic Software` in detail. Above all, it constitutes a classification scheme consisting of five error types which may occur in `BSW` modules.

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

7.4.1 Development Errors

[CP_SWS_J1939Fscp_90012] Definition of development errors in module J1939Fscp

Status: DRAFT

Upstream requirements: [SRS_BSW_00327](#), [SRS_BSW_00337](#), [SRS_BSW_00385](#), [SRS_BSW_00441](#)

Type of error	Related error code	Error value
An API was called while the module was uninitialized	J1939FSCP_E_UNINIT	0x01
J1939Fscp_Init was called twice	J1939FSCP_E_REINIT	0x02
J1939Fscp_Init was called with an invalid configuration pointer	J1939FSCP_E_INIT_FAILED	0x03
An API service was called with a NULL pointer	J1939FSCP_E_PARAM_POINTER	0x04
An API service was called with a wrong PDU ID	J1939FSCP_E_INVALID_PDU_SDU_ID	0x05
An API service was called with a wrong PDU length	J1939FSCP_E_INVALID_SIZE	0x06

7.4.2 Runtime Errors

[CP_SWS_J1939Fscp_90013] Definition of runtime errors in module J1939Fscp

Status: DRAFT

Upstream requirements: [SRS_BSW_00327](#), [SRS_BSW_00452](#), [SRS_BSW_00385](#), [SRS_BSW_00441](#)

Type of error	Related error code	Error value
An SHM message was received with an unknown PGN	J1939FSCP_E_UNKNOWN_PGN	0x01
Two consecutive SDM PDUs were received with no SHM PDU in between	J1939FSCP_E_NO_SHM_RECEIVED	0x02
Two consecutive SHM PDUs were received with no SDM PDU in between	J1939FSCP_E_NO_SDM_RECEIVED	0x03
SRVT of SDG reception has timed out	J1939FSCP_E_TIMEOUT_RX_SRVT	0x04
SRVT of SDG transmission has timed out	J1939FSCP_E_TIMEOUT_TX_SRVT	0x05

7.4.3 Production Errors

The [J1939Fscp](#) module does not define production errors.

7.4.4 Extended Production Errors

The [J1939Fscp](#) module does not define extended production errors.

7.5 Security Events

The [J1939Fscp](#) module does not report security events.

8 API Specification

8.1 API Parameter Checking

The `J1939Fscp` performs parameter checks for all called APIs. It reports the development error `J1939FSCP_E_INVALID_PDU_SDU_ID` when a check of a PDU/SDU ID fails and `J1939FSCP_E_PARAM_POINTER` when a call provides a NULL pointer.

[CP_SWS_J1939Fscp_00002] Invalid PDU IDs

Status: DRAFT

Upstream requirements: [SRS_BSW_00386](#)

[If development error detection is enabled via `J1939FscpDevErrorDetect`, the `J1939Fscp` shall check `PduIdType` parameters of its API functions against the configured IDs, and shall report the development error `J1939FSCP_E_INVALID_PDU_SDU_ID` when an unknown ID is provided by the call.]

`J1939FSCP_E_PARAM_POINTER` shall be reported as specified in [19, SWS BSW General] by [SWS_BSW_00212].

`J1939FSCP_E_UNINIT` shall be reported as specified in [19, SWS BSW General] by [SWS_BSW_00243].

8.2 Imported Types

In this section, all types used by the `J1939Fscp` are listed together with the defining module:

[CP_SWS_J1939Fscp_90001] Definition of imported datatypes of module J1939Fscp

Status: DRAFT

[

Module	Header File	Imported Type
Comtype	ComStack_Types.h	PduIdType
	ComStack_Types.h	PduInfoType
	ComStack_Types.h	PduLengthType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

]

The types that are declared in `ComStack_Types.h` are defined in [23, SWS Communication Stack Types], while the types declared in `Std_Types.h` are defined in [24, SWS Standard Types].

8.3 Type Definitions

8.3.1 J1939Fscp_ConfigType

[CP_SWS_J1939Fscp_90004] Definition of datatype J1939Fscp_ConfigType

Status: DRAFT

Name	J1939Fscp_ConfigType (draft)	
Kind	Structure	
Elements	implementation specific	
	Type	—
	Comment	—
Description	This is the base type for the configuration of the J1939 Functional Safety Communication Protocol. A pointer to an instance of this structure will be used in the initialization of the J1939 Functional Safety Communication Protocol. The content of this structure is not standardized and depends on the configuration of the module. See chapter 10 Configuration. Tags: atp.Status=draft	
Available via	J1939Fscp.h	

]

8.4 Function Definitions

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

8.4.1 J1939Fscp_Init

[CP_SWS_J1939Fscp_90005] Definition of API function J1939Fscp_Init

Status: DRAFT

Service Name	J1939Fscp_Init (draft)	
Syntax	<pre>void J1939Fscp_Init (const J1939Fscp_ConfigType* configPtr)</pre>	
Service ID [hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	configPtr	Pointer to selected configuration structure
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	





Description	This function initializes the J1939 Functional Safety Communication Protocol. Tags: atp.Status=draft
Available via	J1939Fscp.h

]

See [Chapter 7.2.1](#) for details.

See [Chapter 8.1](#) for parameter checks.

[J1939FSCP_E_INIT_FAILED](#) shall be reported as specified in [19, SWS BSW General] by [SWS_BSW_00050].

8.4.2 J1939Fscp_DeInit

[CP_SWS_J1939Fscp_90006] Definition of API function J1939Fscp_DeInit

Status: DRAFT

[

Service Name	J1939Fscp_DeInit (draft)
Syntax	void J1939Fscp_DeInit (void)
Service ID [hex]	0x02
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (in)	None
Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	This function resets the J1939 Functional Safety Communication Protocol to the uninitialized state. Tags: atp.Status=draft
Available via	J1939Fscp.h

]

See [Chapter 7.2.1](#) for details.

8.4.3 J1939Fscp_GetVersionInfo

[CP_SWS_J1939Fscp_90007] Definition of API function J1939Fscp_GetVersionInfo

Status: DRAFT

Upstream requirements: [SRS_BSW_00407](#)

[		
Service Name	J1939Fscp_GetVersionInfo (draft)	
Syntax	<pre>void J1939Fscp_GetVersionInfo (Std_VersionInfoType* versionInfo)</pre>	
Service ID [hex]	0x03	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	versionInfo	Pointer to where to store the version information of this module.
Return value	None	
Description	Returns the version information of this module. Tags: atp.Status=draft	
Available via	J1939Fscp.h	

]

See [19, SWS BSW General] 8.3.4 “Get Version Information” for details. The module ID of the [J1939Fscp](#) is defined in [19, SWS BSW General] 11.2 “Modules”.

See [Chapter 8.1](#) for parameter checks.

8.4.4 J1939Fscp_Transmit

[CP_SWS_J1939Fscp_90010] Definition of API function J1939Fscp_Transmit

Status: DRAFT

[		
Service Name	J1939Fscp_Transmit (draft)	
Syntax	<pre>Std_ReturnType J1939Fscp_Transmit (PduIdType TxPduId, const PduInfoType* PduInfoPtr)</pre>	
Service ID [hex]	0x49	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	TxPduId	Identifier of the PDU to be transmitted
	PduInfoPtr	Length of and pointer to the PDU data and pointer to MetaData.
Parameters (inout)	None	

▽



Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Transmit request has been accepted. E_NOT_OK: Transmit request has not been accepted.
Description	Requests transmission of a PDU. Tags: atp.Status=draft	
Available via	J1939Fscp.h	

]

See [Chapter 7.3.1](#) for details.

See [Chapter 8.1](#) for parameter checks.

[CP_SWS_J1939Fscp_00027] Invalid PDU length

Status: DRAFT

Upstream requirements: [SRS_BSW_00386](#), [SRS_J1939_00057](#), [SRS_J1939_00062](#)

[If development error detection is enabled via [J1939FscpDevErrorDetect](#), the [J1939Fscp](#) shall check that [PduInfoPtr->SduLength](#) does not exceed 13 and matches the configured length of the [SDM](#), and otherwise report the development error [J1939FSCP_E_INVALID_SIZE](#).]

8.5 Callback Notifications

This is a list of functions provided for other modules.

8.5.1 J1939Fscp_RxIndication

[CP_SWS_J1939Fscp_90009] Definition of callback function J1939Fscp_RxIndication

Status: DRAFT

[

Service Name	J1939Fscp_RxIndication (draft)	
Syntax	<pre>void J1939Fscp_RxIndication (PduIdType RxPduId, const PduInfoType* PduInfoPtr)</pre>	
Service ID [hex]	0x42	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	RxPduId	ID of the received PDU.
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.





Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	Indication of a received PDU from a lower layer communication interface module. Tags: atp.Status=draft
Available via	J1939Fscp.h

]

See [Chapter 7.3.2](#) for details.

See [Chapter 7.2.1](#) for error handling and [Chapter 8.1](#) for parameter checks.

8.5.2 J1939Fscp_TxConfirmation

[CP_SWS_J1939Fscp_90011] Definition of callback function J1939Fscp_TxConfirmation

Status: DRAFT

[

Service Name	J1939Fscp_TxConfirmation (draft)	
Syntax	<pre>void J1939Fscp_TxConfirmation (PduIdType TxPduId, Std_ReturnType result)</pre>	
Service ID [hex]	0x40	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	TxPduId	ID of the PDU that has been transmitted.
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU. Tags: atp.Status=draft	
Available via	J1939Fscp.h	

]

See [Chapter 7.3.1](#) for details.

See [Chapter 7.2.1](#) for error handling and [Chapter 8.1](#) for parameter checks.

8.6 Scheduled Functions

This function is directly called by the [Basic Software Scheduler](#) (SchM).

8.6.1 J1939Fscp_MainFunction

[CP_SWS_J1939Fscp_90008] Definition of scheduled function J1939Fscp_MainFunction

Status: DRAFT

[

Service Name	J1939Fscp_MainFunction (draft)
Syntax	void J1939Fscp_MainFunction (void)
Service ID [hex]	0x04
Description	Main function of the J1939 Functional Safety Communication Protocol. Used for scheduling purposes and timeout supervision. Tags: atp.Status=draft
Available via	SchM_J1939Fscp.h

]

[CP_SWS_J1939Fscp_00001] Main Function Period

Status: DRAFT

Upstream requirements: [SRS_BSW_00478](#)

[The frequency of invocations of [J1939Fscp_MainFunction](#) is determined by the configuration parameter [J1939FscpMainFunctionPeriod](#).]

See [Chapter 7.3.3](#) for details.

8.7 Expected Interfaces

In this section all interfaces required from other modules are listed.

8.7.1 Mandatory Interfaces

This section defines all interfaces that are required to fulfill the core functionality of the module.

[CP_SWS_J1939Fscp_90002] Definition of mandatory interfaces required by module J1939Fscp

Status: DRAFT

[

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

]

8.7.2 Optional Interfaces

This section defines all interfaces that are required to fulfill an optional functionality of the module.

[CP_SWS_J1939Fscp_90003] Definition of optional interfaces requested by module J1939Fscp

Status: DRAFT

API Function	Header File	Description
Det_ReportError	Det.h	Service to report development errors.
PduR_J1939FscpRxIndication	PduR_J1939Fscp.h	Indication of a received PDU from a lower layer communication interface module.
PduR_J1939FscpTransmit	PduR_J1939Fscp.h	Requests transmission of a PDU.
PduR_J1939FscpTxConfirmation	PduR_J1939Fscp.h	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.

9 Sequence Diagrams

9.1 Message Transmission

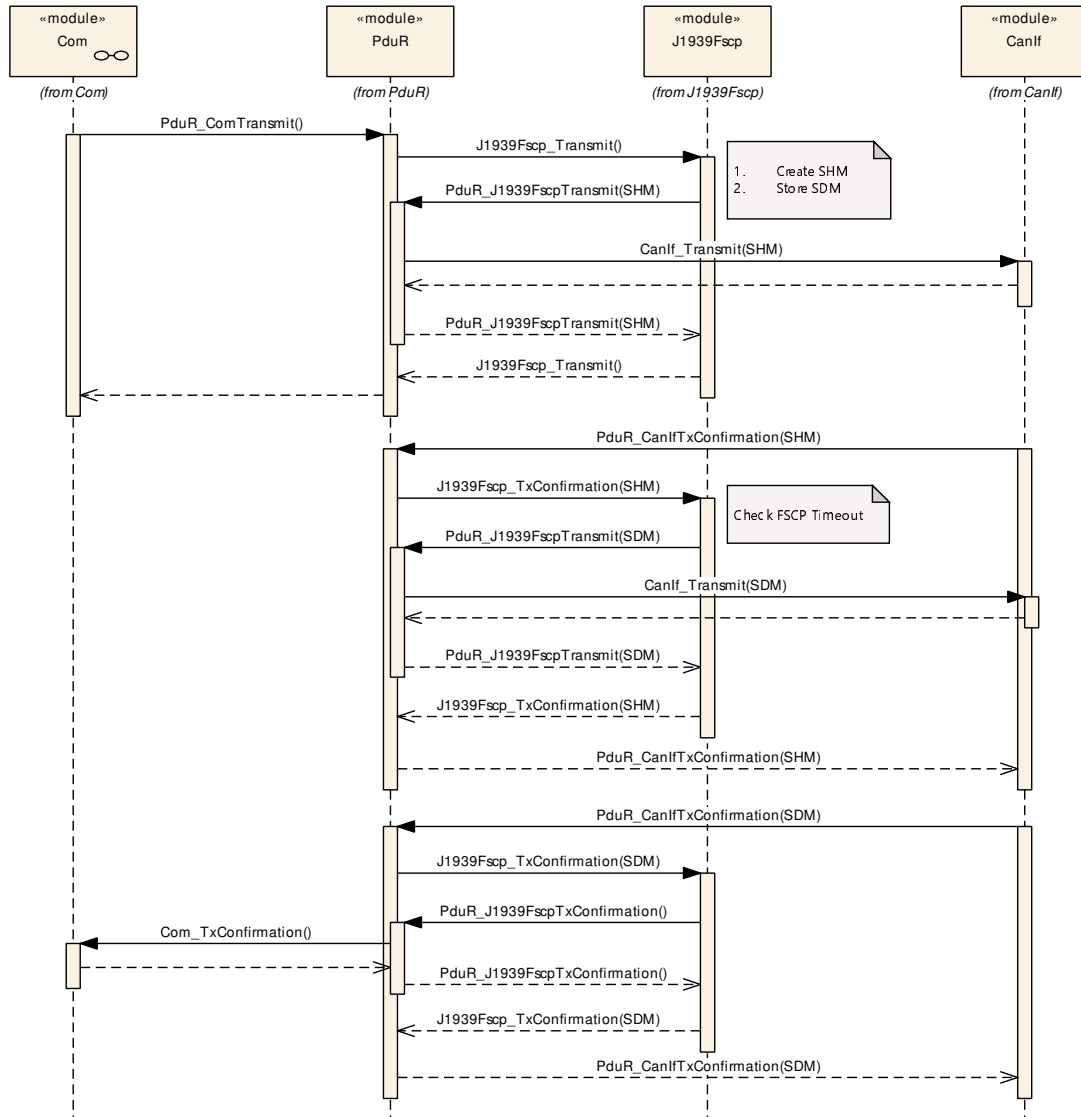


Figure 9.1: Transmission of J1939Fscp Messages

9.2 Message Reception

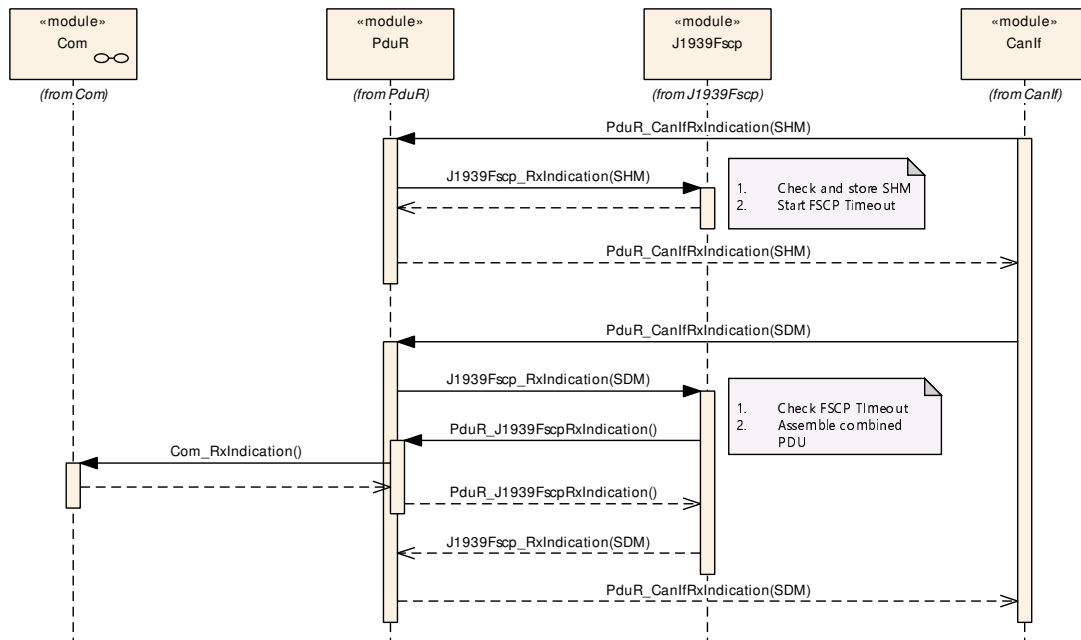


Figure 9.2: Reception of J1939Fscp Messages

9.3 Signal Group Transformation

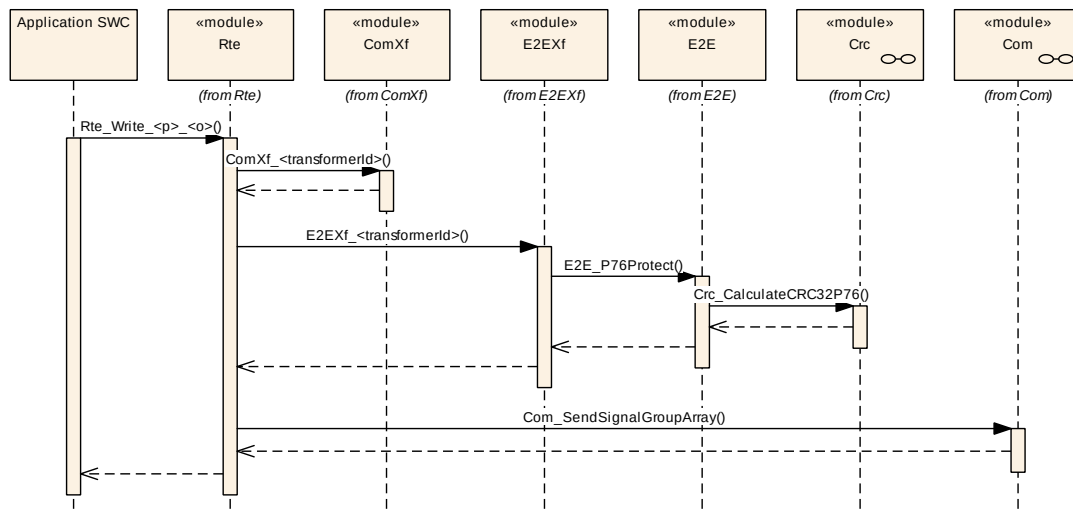


Figure 9.3: Transformation of Signal Groups for J1939Fscp Transmission

10 Configuration Specification

In general, this chapter defines configuration parameters and their clustering into containers. For general information about the definition of containers and parameters, refer to [19, SWS BSW General] 10.1 “Introduction to configuration specification”. For details about published information of the J1939Fscp, refer to [19, SWS BSW General] 10.3 “Published Information”.

The Chapter 10.1 specifies the structure (containers) and the parameters of the module J1939Fscp. Chapter 10.2 specifies some constraints on the configuration.

10.1 Containers and configuration parameters

The following subsections summarize all configuration parameters of the J1939Fscp. The detailed meaning of the parameters is described in chapters 7 and 8.

Some of these containers and parameters are derived from classes and attributes of the [1, CP TPS System Template], which also contains the rules for these derivations.

The following pictures show an overview of the configuration parameters available for J1939Fscp.

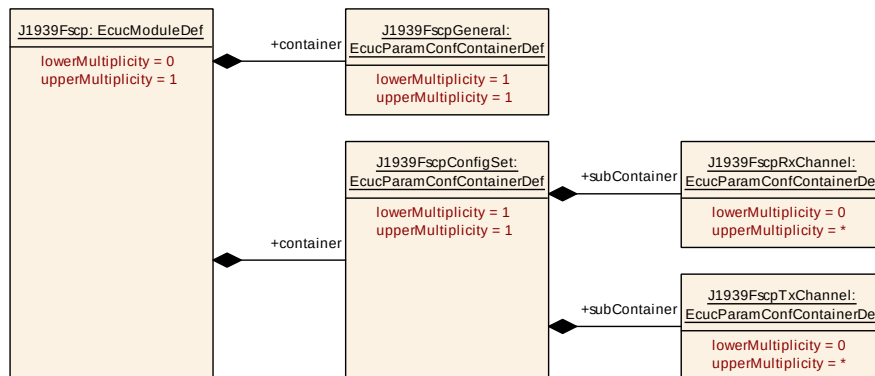


Figure 10.1: Module Configuration

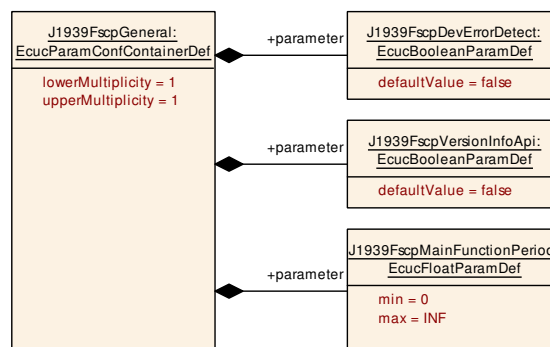


Figure 10.2: General Configuration

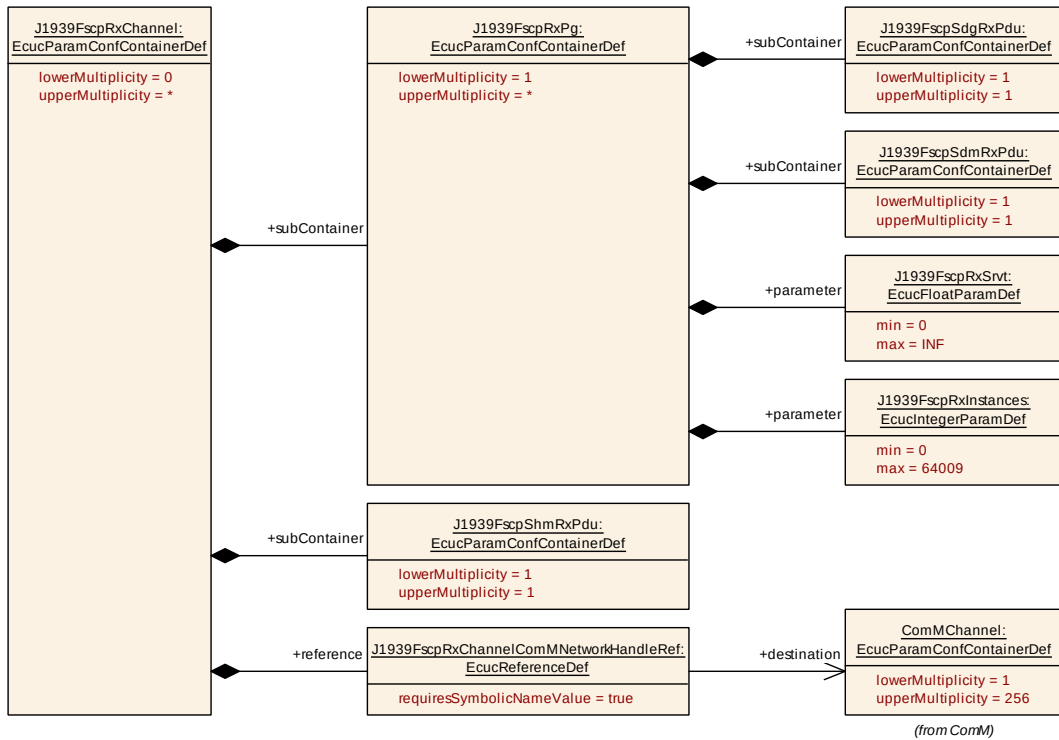


Figure 10.3: Configuration of Rx Channels

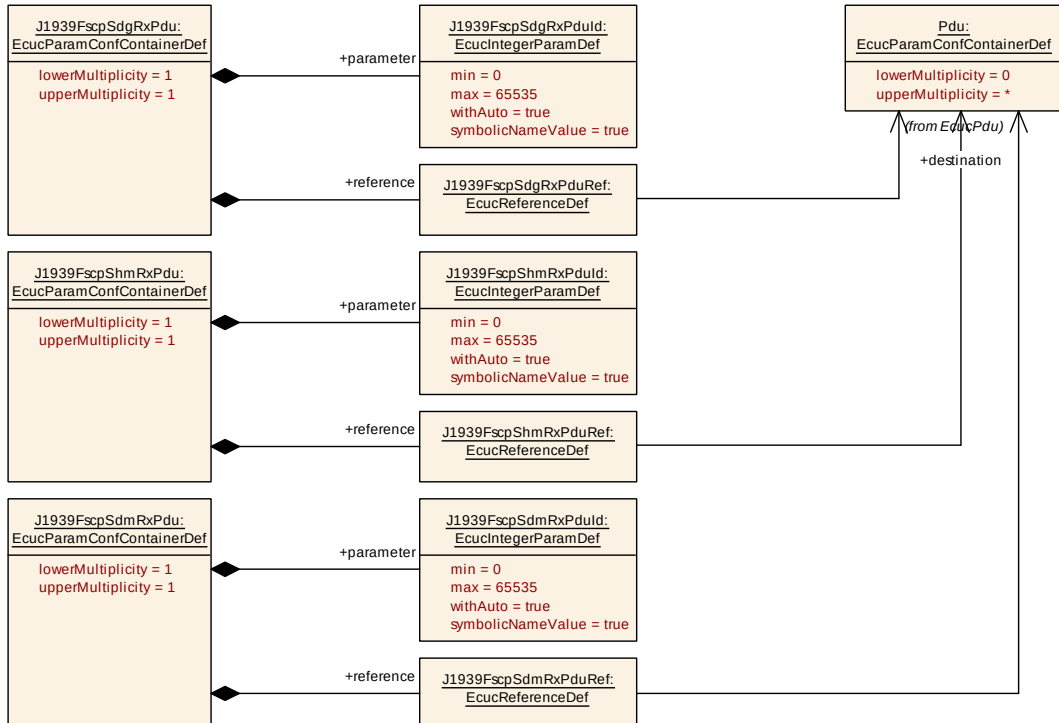


Figure 10.4: Configuration of Rx PDUs

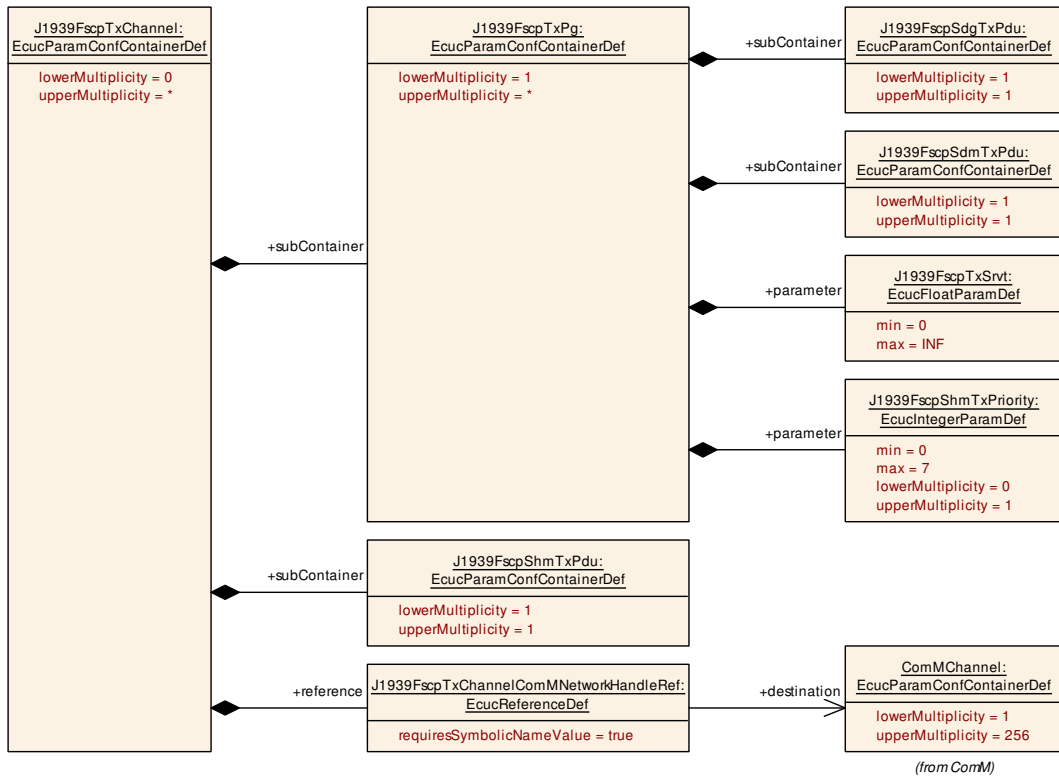


Figure 10.5: Configuration of Tx Channels

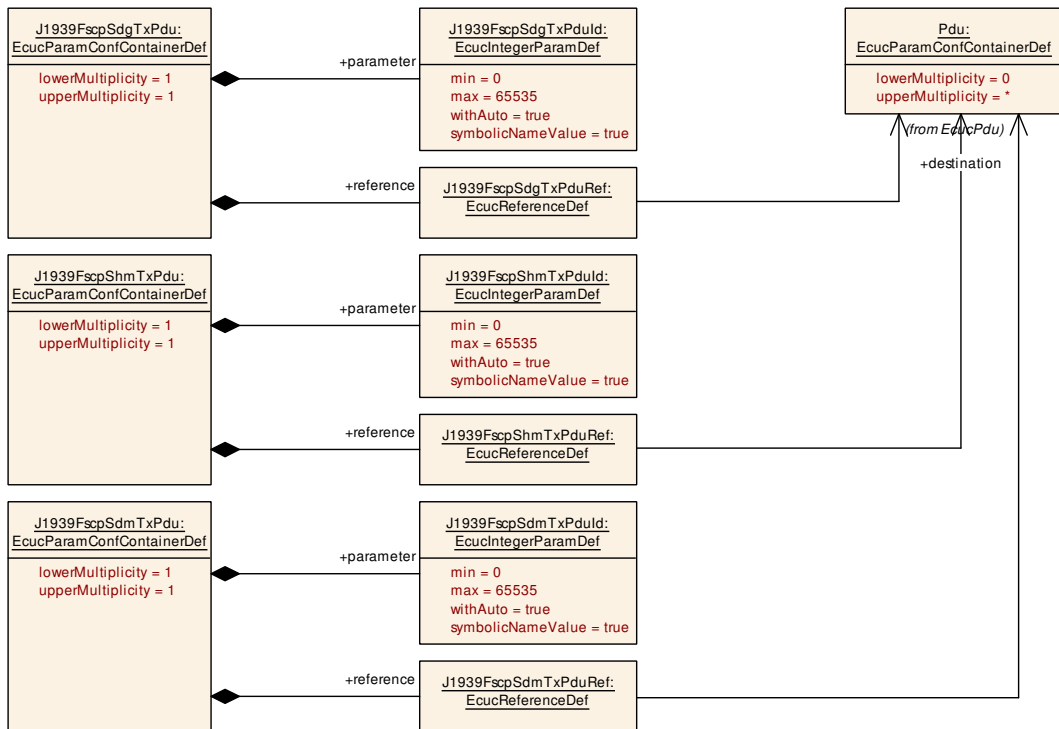


Figure 10.6: Configuration of Tx PDUs

10.1.1 J1939Fscp

[ECUC_J1939Fscp_00001] Definition of EcucModuleDef J1939Fscp

Status: DRAFT

[

Module Name	J1939Fscp
Description	The J1939 Functional Safety Communication Protocol covers the handling of SHM and SDM messages for E2E protected communication according to SAE J1939-76.
Supported Config Variants	VARIANT-LINK-TIME, VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Dependency
J1939FscpConfigSet	1	Configuration parameters and sub containers of the J1939Fscp module. Tags: atp.Status=draft
J1939FscpGeneral	1	General configuration parameters of the J1939Fscp module. Tags: atp.Status=draft

]

10.1.2 J1939FscpGeneral

[ECUC_J1939Fscp_00002] Definition of EcucParamConfContainerDef J1939Fscp General

Status: DRAFT

[

Container Name	J1939FscpGeneral
Parent Container	J1939Fscp
Description	General configuration parameters of the J1939Fscp module. Tags: atp.Status=draft
Multiplicity	1
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpDevErrorDetect	1	[ECUC_J1939Fscp_00006]
J1939FscpMainFunctionPeriod	1	[ECUC_J1939Fscp_00008]
J1939FscpVersionInfoApi	1	[ECUC_J1939Fscp_00007]

No Included Containers

]

[ECUC_J1939Fscp_00006] Definition of EcucBooleanParamDef J1939FscpDevErrorDetect

Status: DRAFT

[

Parameter Name	J1939FscpDevErrorDetect		
Parent Container	J1939FscpGeneral		
Description	Enables/disables the development error detection. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency			

]

[ECUC_J1939Fscp_00008] Definition of EcucFloatParamDef J1939FscpMainFunctionPeriod

Status: DRAFT

[

Parameter Name	J1939FscpMainFunctionPeriod		
Parent Container	J1939FscpGeneral		
Description	Execution cycle of J1939Fscp_MainFunction. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency			

]

[ECUC_J1939Fscp_00007] Definition of EcucBooleanParamDef J1939FscpVersionInfoApi

Status: DRAFT

Parameter Name	J1939FscpVersionInfoApi		
Parent Container	J1939FscpGeneral		
Description	Enables/disables the function J1939Fscp_GetVersionInfo() to get major, minor and patch version information. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	—	
	Post-build time	—	
Dependency			

10.1.3 J1939FscpConfigSet

[ECUC_J1939Fscp_00003] Definition of EcucParamConfContainerDef J1939FscpConfigSet

Status: DRAFT

Container Name	J1939FscpConfigSet	
Parent Container	J1939Fscp	
Description	Configuration parameters and sub containers of the J1939Fscp module. Tags: atp.Status=draft	
Multiplicity	1	
Configuration Parameters		
No Included Parameters		
Included Containers		
Container Name	Multiplicity	Dependency
J1939FscpRxChannel	0..*	Physical CAN channel used for reception by J1939Fscp. Tags: atp.Status=draft
J1939FscpTxChannel	0..*	Physical CAN channel used for transmission by J1939Fscp. Tags: atp.Status=draft

10.1.4 J1939FscpRxChannel

[ECUC_J1939Fscp_00004] Definition of EcucParamConfContainerDef J1939FscpRxChannel

Status: DRAFT

Container Name		J1939FscpRxChannel	
Parent Container		J1939FscpConfigSet	
Description		Physical CAN channel used for reception by J1939Fscp. Tags: atp.Status=draft	
Multiplicity		0..*	
Post-Build Variant Multiplicity		true	
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			
Included Parameters			
Parameter Name		Multiplicity	ECUC ID
J1939FscpRxChannelComMNetworkHandleRef		1	[ECUC_J1939Fscp_00021]
Included Containers			
Container Name	Multiplicity	Dependency	
J1939FscpRxPg	1..*	Contains the configuration of the received SDM and of the upper layer PDU. Tags: atp.Status=draft	
J1939FscpShmRxPdu	1	Contains the configuration of the PDU used to receive the SHM PG. This PDU consumes a meta data item of type CAN_ID_32. Tags: atp.Status=draft	

[ECUC_J1939Fscp_00021] Definition of EcucReferenceDef J1939FscpRxChannelComMNetworkHandleRef

Status: DRAFT

[			
Parameter Name	J1939FscpRxChannelComMNetworkHandleRef		
Parent Container	J1939FscpRxChannel		
Description	Reference to the ComMChannel which corresponds to the J1939FscpRxChannel. This parameter is useful for the validation of the J1939Fscp configuration. Tags: atp.Status=draft		
Multiplicity	1		
Type	Symbolic name reference to ComMChannel		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
]			



△

	Post-build time	–	
Dependency			

」

10.1.5 J1939FscpRxPg

[ECUC_J1939Fscp_00012] Definition of EcucParamConfContainerDef J1939FscpRxPg

Status: DRAFT

「

Container Name	J1939FscpRxPg		
Parent Container	J1939FscpRxChannel		
Description	Contains the configuration of the received SDM and of the upper layer PDU. Tags: atp.Status=draft		
Multiplicity	1..*		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpRxInstances	1	[ECUC_J1939Fscp_00020]
J1939FscpRxSrvt	1	[ECUC_J1939Fscp_00019]

Included Containers		
Container Name	Multiplicity	Dependency
J1939FscpSdgRxPdu	1	Contains the configuration of the PDU used to forward the received SDG to the upper layer. This PDU can produce a meta data item of type CAN_ID_32. Tags: atp.Status=draft
J1939FscpSdmRxPdu	1	Contains the configuration of the PDU used to receive the SDM PG. This PDU can consume a meta data item of type CAN_ID_32. Tags: atp.Status=draft

」

[ECUC_J1939Fscp_00020] Definition of EcucIntegerParamDef J1939FscpRxInstances

Status: DRAFT

Parameter Name	J1939FscpRxInstances		
Parent Container	J1939FscpRxPg		
Description	Configures the maximum number of SDGs that can be received in parallel with the same PGN. This parameter is only relevant if MetaData is configured for the J1939 FscpSdgRxPdu. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 64009		
Default value	–		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

[ECUC_J1939Fscp_00019] Definition of EcucFloatParamDef J1939FscpRxSrvt

Status: DRAFT

Parameter Name	J1939FscpRxSrvt		
Parent Container	J1939FscpRxPg		
Description	This parameter sets the maximum for the Safety-Relevant Validation Time (SRVT_Maximum), which is used to determine a timeout of the corresponding SDM message after reception of an SHM message. After this timeout, the whole SDG is dropped. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	–		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Dependency			

10.1.6 J1939FscpSdgRxPdu

[ECUC_J1939Fscp_00013] Definition of EcucParamConfContainerDef J1939FscpSdgRxPdu

Status: DRAFT

[

Container Name	J1939FscpSdgRxPdu
Parent Container	J1939FscpRxPg
Description	Contains the configuration of the PDU used to forward the received SDG to the upper layer. This PDU can produce a meta data item of type CAN_ID_32. Tags: atp.Status=draft
Multiplicity	1
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpSdgRxPduld	1	[ECUC_J1939Fscp_00014]
J1939FscpSdgRxPduRef	1	[ECUC_J1939Fscp_00015]

No Included Containers

]

[ECUC_J1939Fscp_00014] Definition of EcucIntegerParamDef J1939FscpSdgRxPduld

Status: DRAFT

[

Parameter Name	J1939FscpSdgRxPduld		
Parent Container	J1939FscpSdgRxPdu		
Description	The PDU identifier used for RxIndication to PduR. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

]

[ECUC_J1939Fscp_00015] Definition of EcucReferenceDef J1939FscpSdgRxPduRef

Status: DRAFT

Parameter Name	J1939FscpSdgRxPduRef		
Parent Container	J1939FscpSdgRxPdu		
Description	Reference to the global PDU. Tags: atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

10.1.7 J1939FscpSdmRxPdu

[ECUC_J1939Fscp_00016] Definition of EcucParamConfContainerDef J1939FscpSdmRxPdu

Status: DRAFT

Container Name	J1939FscpSdmRxPdu		
Parent Container	J1939FscpRxPg		
Description	Contains the configuration of the PDU used to receive the SDM PG. This PDU can consume a meta data item of type CAN_ID_32. Tags: atp.Status=draft		
Multiplicity	1		
Configuration Parameters			
Included Parameters			
Parameter Name	Multiplicity	ECUC ID	
J1939FscpSdmRxPduld	1	[ECUC_J1939Fscp_00017]	
J1939FscpSdmRxPduRef	1	[ECUC_J1939Fscp_00018]	
No Included Containers			

[ECUC_J1939Fscp_00017] Definition of EcucIntegerParamDef J1939FscpSdmRxPduId

Status: DRAFT

[

Parameter Name	J1939FscpSdmRxPduId		
Parent Container	J1939FscpSdmRxPdu		
Description	The PDU identifier used for RxIndication from PduR. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

]

[ECUC_J1939Fscp_00018] Definition of EcucReferenceDef J1939FscpSdmRxPduRef

Status: DRAFT

[

Parameter Name	J1939FscpSdmRxPduRef		
Parent Container	J1939FscpSdmRxPdu		
Description	Reference to the global PDU. Tags: atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

]

10.1.8 J1939FscpShmRxPdu

[ECUC_J1939Fscp_00009] Definition of EcucParamConfContainerDef J1939FscpShmRxPdu

Status: DRAFT

[

Container Name	J1939FscpShmRxPdu
Parent Container	J1939FscpRxChannel
Description	Contains the configuration of the PDU used to receive the SHM PG. This PDU consumes a meta data item of type CAN_ID_32. Tags: atp.Status=draft
Multiplicity	1
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpShmRxPduld	1	[ECUC_J1939Fscp_00010]
J1939FscpShmRxPduRef	1	[ECUC_J1939Fscp_00011]

No Included Containers

]

[ECUC_J1939Fscp_00010] Definition of EcucIntegerParamDef J1939FscpShmRxPduld

Status: DRAFT

[

Parameter Name	J1939FscpShmRxPduId		
Parent Container	J1939FscpShmRxPdu		
Description	The PDU identifier used for RxIndication from PduR. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

]

[ECUC_J1939Fscp_00011] Definition of EcucReferenceDef J1939FscpShmRxPduRef

Status: DRAFT

[

Parameter Name	J1939FscpShmRxPduRef
Parent Container	J1939FscpShmRxPdu
Description	Reference to the global PDU. Tags: atp.Status=draft





Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

]

10.1.9 J1939FscpTxChannel

[ECUC_J1939Fscp_00005] Definition of EcucParamConfContainerDef J1939FscpTxChannel

Status: DRAFT

[

Container Name	J1939FscpTxChannel		
Parent Container	J1939FscpConfigSet		
Description	Physical CAN channel used for transmission by J1939Fscp. Tags: atp.Status=draft		
Multiplicity	0..*		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpTxChannelComMNetworkHandleRef	1	[ECUC_J1939Fscp_00035]

Included Containers		
Container Name	Multiplicity	Dependency
J1939FscpShmTxPdu	1	Contains the configuration of the PDU used to transmit the SHM PG. This PDU produces a meta data item of type CAN_ID_32. Tags: atp.Status=draft
J1939FscpTxPg	1..*	Contains the configuration of the transmitted SDM and of the upper layer PDU. Tags: atp.Status=draft

]

[ECUC_J1939Fscp_00035] Definition of EcucReferenceDef J1939FscpTxChannelComMNetworkHandleRef

Status: DRAFT

Parameter Name	J1939FscpTxChannelComMNetworkHandleRef		
Parent Container	J1939FscpTxChannel		
Description	Reference to the ComMChannel which corresponds to the J1939FscpTxChannel. This parameter is useful for the validation of the J1939Fscp configuration. Tags: atp.Status=draft		
Multiplicity	1		
Type	Symbolic name reference to ComMChannel		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

10.1.10 J1939FscpTxPg

[ECUC_J1939Fscp_00025] Definition of EcucParamConfContainerDef J1939FscpTxPg

Status: DRAFT

Container Name	J1939FscpTxPg		
Parent Container	J1939FscpTxChannel		
Description	Contains the configuration of the transmitted SDM and of the upper layer PDU. Tags: atp.Status=draft		
Multiplicity	1..*		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpShmTxPriority	0..1	[ECUC_J1939Fscp_00033]
J1939FscpTxSrvt	1	[ECUC_J1939Fscp_00032]

Included Containers		
Container Name	Multiplicity	Dependency
J1939FscpSdgTxPdu	1	Contains the configuration of the PDU used to accept the transmitted SDG from the upper layer. This PDU can consume a meta data item of type CAN_ID_32. Tags: atp.Status=draft
J1939FscpSdmTxPdu	1	Contains the configuration of the PDU used to transmit the SDM PG. This PDU can produce a meta data item of type CAN_ID_32. Tags: atp.Status=draft

]

[ECUC_J1939Fscp_00033] Definition of EcucIntegerParamDef J1939FscpShmTxPriority

Status: DRAFT

[

Parameter Name	J1939FscpShmTxPriority		
Parent Container	J1939FscpTxPg		
Description	Configures the priority to be used for transmission of the SHM message. This parameter can be used to override the priority provided with MetaData from the J1939 FscpSdgTxPdu. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	—		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Dependency			

]

[ECUC_J1939Fscp_00032] Definition of EcucFloatParamDef J1939FscpTxSrvt

Status: DRAFT

[

Parameter Name	J1939FscpTxSrvt		
Parent Container	J1939FscpTxPg		
Description	This parameter sets the maximum for the Safety-Relevant Validation Time (SRVT_ Maximum), which is used to determine a time limit for the transmission of the corresponding SDM message after transmission of an SHM message. After this time, the SDM is dropped. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	]0 .. INF[		
Default value	–		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Dependency			

]

10.1.11 J1939FscpSdgTxPdu

[ECUC_J1939Fscp_00026] Definition of EcucParamConfContainerDef J1939Fscp SdgTxPdu

Status: DRAFT

[

Container Name	J1939FscpSdgTxPdu		
Parent Container	J1939FscpTxPg		
Description	Contains the configuration of the PDU used to accept the transmitted SDG from the upper layer. This PDU can consume a meta data item of type CAN_ID_32. Tags: atp.Status=draft		
Multiplicity	1		
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpSdgTxPduld	1	[ECUC_J1939Fscp_00027]
J1939FscpSdgTxPduRef	1	[ECUC_J1939Fscp_00028]

No Included Containers

]

[ECUC_J1939Fscp_00027] Definition of EcucIntegerParamDef J1939FscpSdgTxPduId

Status: DRAFT

Parameter Name	J1939FscpSdgTxPduId		
Parent Container	J1939FscpSdgTxPdu		
Description	The PDU identifier used for Transmit from PduR. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

[ECUC_J1939Fscp_00028] Definition of EcucReferenceDef J1939FscpSdgTxPduRef

Status: DRAFT

Parameter Name	J1939FscpSdgTxPduRef		
Parent Container	J1939FscpSdgTxPdu		
Description	Reference to the global PDU. Tags: atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

10.1.12 J1939FscpSdmTxPdu

[ECUC_J1939Fscp_00029] Definition of EcucParamConfContainerDef J1939FscpSdmTxPdu

Status: DRAFT

--	--	--	--

Container Name	J1939FscpSdmTxPdu
Parent Container	J1939FscpTxPg
Description	Contains the configuration of the PDU used to transmit the SDM PG. This PDU can produce a meta data item of type CAN_ID_32. Tags: atp.Status=draft
Multiplicity	1
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpSdmTxPduld	1	[ECUC_J1939Fscp_00030]
J1939FscpSdmTxPduRef	1	[ECUC_J1939Fscp_00031]

No Included Containers

]

[ECUC_J1939Fscp_00030] Definition of EcucIntegerParamDef J1939FscpSdmTxPduld

Status: DRAFT

[

Parameter Name	J1939FscpSdmTxPduld		
Parent Container	J1939FscpSdmTxPdu		
Description	The PDU identifier used for TxConfirmation to PduR. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

]

[ECUC_J1939Fscp_00031] Definition of EcucReferenceDef J1939FscpSdmTxPduRef

Status: DRAFT

[

Parameter Name	J1939FscpSdmTxPduRef
Parent Container	J1939FscpSdmTxPdu
Description	Reference to the global PDU. Tags: atp.Status=draft





Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

]

10.1.13 J1939FscpShmTxPdu

[ECUC_J1939Fscp_00022] Definition of EcucParamConfContainerDef J1939FscpShmTxPdu

Status: DRAFT

[

Container Name	J1939FscpShmTxPdu
Parent Container	J1939FscpTxChannel
Description	Contains the configuration of the PDU used to transmit the SHM PG. This PDU produces a meta data item of type CAN_ID_32. Tags: atp.Status=draft
Multiplicity	1
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
J1939FscpShmTxPduld	1	[ECUC_J1939Fscp_00023]
J1939FscpShmTxPduRef	1	[ECUC_J1939Fscp_00024]

No Included Containers

]

[ECUC_J1939Fscp_00023] Definition of EcucIntegerParamDef J1939FscpShmTxPduld

Status: DRAFT

[

Parameter Name	J1939FscpShmTxPduld
Parent Container	J1939FscpShmTxPdu
Description	The PDU identifier used for TxConfirmation to PduR. Tags: atp.Status=draft
Multiplicity	1





Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Dependency	withAuto = true		

]

[ECUC_J1939Fscp_00024] Definition of EcucReferenceDef J1939FscpShmTxPduRef

Status: DRAFT

[

Parameter Name	J1939FscpShmTxPduRef		
Parent Container	J1939FscpShmTxPdu		
Description	Reference to the global PDU. Tags: atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Dependency			

]

10.2 Configuration Constraints

This section lists constraints on the configuration of the [J1939Fscp](#).

[CP_SWS_J1939Fscp_CONSTR_00001] Timing Constraints

Status: DRAFT

[The [J1939FscpMainFunctionPeriod](#) shall be configured such that the cycle time is small enough to cope with all configured values for [J1939FscpRxSrvt](#) and [J1939FscpTxSrvt](#).]

[CP_SWS_J1939Fscp_CONSTR_00002] MetaData Transmission Constraint

Status: DRAFT

[The two global Pdus that are referenced as [J1939FscpSdgTxPduRef](#) and [J1939FscpSdmTxPduRef](#) shall both refer to the same MetaDataType, or to no MetaDataType.]

[CP_SWS_J1939Fscp_CONSTR_00003] MetaData Reception Constraint

Status: DRAFT

[The two global Pdus that are referenced as [J1939FscpSdgRxPduRef](#) and [J1939FscpSdmRxPduRef](#) shall both refer to the same MetaDataType, or to no MetaDataType.]

A Not applicable requirements

[CP_SWS_J1939Fscp_NA_00001] Requirements Not Applicable to this Specification

Status: DRAFT

Upstream requirements: SRS_BSW_00168

[These requirements are not applicable to this specification.]

B Change History of AUTOSAR Traceable Items

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

B.1 Traceable Item History of this Document According to AUTOSAR Release R25-11

B.1.1 Added Specification Items in R25-11

none

B.1.2 Changed Specification Items in R25-11

[\[ECUC_J1939Fscp_00017\]](#)

B.1.3 Deleted Specification Items in R25-11

none

B.1.4 Added Constraints in R25-11

none

B.1.5 Changed Constraints in R25-11

none

B.1.6 Deleted Constraints in R25-11

none

B.2 Traceable Item History of this Document According to AUTOSAR Release R24-11

B.2.1 Added Specification Items in R24-11

[CP_SWS_J1939Fscp_00001] [CP_SWS_J1939Fscp_00002] [CP_SWS_J1939Fscp_00003] [CP_SWS_J1939Fscp_00004] [CP_SWS_J1939Fscp_00005] [CP_SWS_J1939Fscp_00006] [CP_SWS_J1939Fscp_00007] [CP_SWS_J1939Fscp_00008] [CP_SWS_J1939Fscp_00009] [CP_SWS_J1939Fscp_00010] [CP_SWS_J1939Fscp_00011] [CP_SWS_J1939Fscp_00012] [CP_SWS_J1939Fscp_00013] [CP_SWS_J1939Fscp_00014] [CP_SWS_J1939Fscp_00015] [CP_SWS_J1939Fscp_00016] [CP_SWS_J1939Fscp_00017] [CP_SWS_J1939Fscp_00018] [CP_SWS_J1939Fscp_00020] [CP_SWS_J1939Fscp_00021] [CP_SWS_J1939Fscp_00022] [CP_SWS_J1939Fscp_00023] [CP_SWS_J1939Fscp_00024] [CP_SWS_J1939Fscp_00025] [CP_SWS_J1939Fscp_00026] [CP_SWS_J1939Fscp_00027] [CP_SWS_J1939Fscp_00028] [CP_SWS_J1939Fscp_90001] [CP_SWS_J1939Fscp_90002] [CP_SWS_J1939Fscp_90003] [CP_SWS_J1939Fscp_90004] [CP_SWS_J1939Fscp_90005] [CP_SWS_J1939Fscp_90006] [CP_SWS_J1939Fscp_90007] [CP_SWS_J1939Fscp_90008] [CP_SWS_J1939Fscp_90009] [CP_SWS_J1939Fscp_90010] [CP_SWS_J1939Fscp_90011] [CP_SWS_J1939Fscp_90012] [CP_SWS_J1939Fscp_90013] [ECUC_J1939Fscp_00001] [ECUC_J1939Fscp_00002] [ECUC_J1939Fscp_00003] [ECUC_J1939Fscp_00004] [ECUC_J1939Fscp_00005] [ECUC_J1939Fscp_00006] [ECUC_J1939Fscp_00007] [ECUC_J1939Fscp_00008] [ECUC_J1939Fscp_00009] [ECUC_J1939Fscp_00010] [ECUC_J1939Fscp_00011] [ECUC_J1939Fscp_00012] [ECUC_J1939Fscp_00013] [ECUC_J1939Fscp_00014] [ECUC_J1939Fscp_00015] [ECUC_J1939Fscp_00016] [ECUC_J1939Fscp_00017] [ECUC_J1939Fscp_00018] [ECUC_J1939Fscp_00019] [ECUC_J1939Fscp_00020] [ECUC_J1939Fscp_00021] [ECUC_J1939Fscp_00022] [ECUC_J1939Fscp_00023] [ECUC_J1939Fscp_00024] [ECUC_J1939Fscp_00025] [ECUC_J1939Fscp_00026] [ECUC_J1939Fscp_00027] [ECUC_J1939Fscp_00028] [ECUC_J1939Fscp_00029] [ECUC_J1939Fscp_00030] [ECUC_J1939Fscp_00031] [ECUC_J1939Fscp_00032] [ECUC_J1939Fscp_00033] [ECUC_J1939Fscp_00035]

B.2.2 Changed Specification Items in R24-11

none

B.2.3 Deleted Specification Items in R24-11

none

B.2.4 Added Constraints in R24-11

[\[CP_SWS_J1939Fscp_CONSTR_00001\]](#) [\[CP_SWS_J1939Fscp_CONSTR_00002\]](#)
[\[CP_SWS_J1939Fscp_CONSTR_00003\]](#)

B.2.5 Changed Constraints in R24-11

none

B.2.6 Deleted Constraints in R24-11

none