Document Title	Specification of ISO15118 Charging
Document Category	Software specification (SWS)
Document UID	1095
Document Status	published
Part of AUTOSAR Standard	Classic Platform
Part of Standard Release	R26-11

Document Change History			
Date	**Release**	**Changed by**	**Description**
2026-11-26	R26-11	AUTOSAR Release Management	• RS dependency removed • Editorial changes
2025-11-27	R25-11	AUTOSAR Release Management	• Editorial changes
2024-11-27	R24-11	AUTOSAR Release Management	• Added chapter 8 • Revised diagrams in chapter 9 • replaced ChrgM with ISO15118Chrg • requirements updated with service interfaces • Section 3.2 updated • Added missing references • Fixed the scale of figures • Removed appendix A with no applicable requirements • changed lowercase to uppercase starting letters in bullet points
2023-11-23	R23-11	AUTOSAR Release Management	• Initial release

Disclaimer

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

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

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

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

The word AUTOSAR and the AUTOSAR logo are registered trademarks.

Table of Contents

1 Introduction and functional overview 8
2 Acronyms and Abbreviations 9
3 Related documentation 10
3.1 Input documents . . . 10
3.2 Related Standards . . . 10
4 Constraints and assumptions 11
4.1 Limitations . . . 11
4.2 Applicability to car domains . . . 11
5 Dependencies to other modules 12
5.1 ECU State Manager (EcuM) . . . 12
5.2 Basic Software Mode Manager (BswM) . . . 12
5.3 BSW Scheduler (SchM) . . . 12
5.4 Ethernet State Manager (EthSM) . . . 12
5.5 Socket Adaptor (SoAd) . . . 12
5.6 TcpIp . . . 12
5.7 Ethernet Interface (EthIf) . . . 12
5.8 Ethernet Driver (EthDrv) . . . 13
5.9 Ethernet Transceiver Driver (EthTrcv) . . . 13
5.10 Crypto Service Module (Csm) . . . 13
5.11 Key Manager (KeyM) . . . 13
6 Requirements Traceability 14
7 Functional specification 16
7.1 Charging Manager (ISO15118Chrg) Overview . . . 16
7.2 Charging Manager General Requirements . . . 16
7.2.1 Transmission of Charging Control Messages . . . 18
7.2.2 Reception of Charging Control Messages . . . 18
7.3 ISO15118Chrg Connection Setup . . . 21
7.4 ISO15118Chrg Charging Control Messages . . . 26
7.4.1 General Control Messages . . . 26
7.4.1.1 Control Messages for AC Charging . . . 34
7.4.1.2 Control Messages for DC Charging . . . 36
7.5 Error Classification . . . 42
7.5.1 Development Errors . . . 43
7.5.2 Runtime Errors . . . 43
7.5.3 Production Errors . . . 43
7.6 Security Events . . . 43

8 API specification 44
8.1 Imported types . . . 44
8.2 Type definitions . . . 45
8.2.1 ISO15118Chrg_ConfigType . . . 45
8.2.2 ISO15118Chrg_AC_EVChargeParameterType . . . 45
8.2.3 ISO15118Chrg_AC_EVSEChargeParameterType . . . 46
8.2.4 ISO15118Chrg_AC_EVSEStatusType . . . 47
8.2.5 ISO15118Chrg_AppProtocolType . . . 48
8.2.6 ISO15118Chrg_AppProtocolType_ArrayType . . . 49
8.2.7 ISO15118Chrg_CertificateChainType . . . 49
8.2.8 ISO15118Chrg_ChargeProgressType . . . 50
8.2.9 ISO15118Chrg_ChargeServiceType . . . 50
8.2.10 ISO15118Chrg_ChargingProfileType . . . 51
8.2.11 ISO15118Chrg_ChargingSequenceStateType . . . 52
8.2.12 ISO15118Chrg_ChargingSequenceSubStateType . . . 53
8.2.13 ISO15118Chrg_ChargingSessionType . . . 53
8.2.14 ISO15118Chrg_ConsumptionCostType . . . 54
8.2.15 ISO15118Chrg_CostKindType . . . 55
8.2.16 ISO15118Chrg_CostType . . . 55
8.2.17 ISO15118Chrg_DC_EVChargeParameterType . . . 56
8.2.18 ISO15118Chrg_DC_EVErrorCodeType . . . 57
8.2.19 ISO15118Chrg_DC_EVPowerDeliveryParameterType . . . 58
8.2.20 ISO15118Chrg_DC_EVSEChargeParameterType . . . 58
8.2.21 ISO15118Chrg_DC_EVSEStatusCodeType . . . 59
8.2.22 ISO15118Chrg_DC_EVSEStatusType . . . 60
8.2.23 ISO15118Chrg_DC_EVStatusType . . . 61
8.2.24 ISO15118Chrg_eMAIDType . . . 62
8.2.25 ISO15118Chrg_EnergyTransferModeType . . . 62
8.2.26 ISO15118Chrg_EntryType . . . 63
8.2.27 ISO15118Chrg_EVSEIdType . . . 63
8.2.28 ISO15118Chrg_EVSENotificationType . . . 64
8.2.29 ISO15118Chrg_IsolationLevelTypeType . . . 64
8.2.30 ISO15118Chrg_MeterInfoType . . . 65
8.2.31 ISO15118Chrg_ParameterSetTypeType . . . 65
8.2.32 ISO15118Chrg_ParameterSetType_ArrayType . . . 66
8.2.33 ISO15118Chrg_ParameterType . . . 67
8.2.34 ISO15118Chrg_PaymentOptionListType . . . 68
8.2.35 ISO15118Chrg_PaymentOptionType . . . 68
8.2.36 ISO15118Chrg_PhysicalValueType . . . 69
8.2.37 ISO15118Chrg_PmaxScheduleEntryType . . . 69
8.2.38 ISO15118Chrg_PMaxScheduleType_ArrayType . . . 70
8.2.39 ISO15118Chrg_PMaxScheduleTypePtr . . . 70
8.2.40 ISO15118Chrg_ProfileEntryType . . . 71

8.2.41 ISO15118Chrg_ProtocolNameSpaceType . . . 71
8.2.42 ISO15118Chrg_RelativeTimeIntervalType . . . 72
8.2.43 ISO15118Chrg_ResponseCodeType . . . 72
8.2.44 ISO15118Chrg_SalesTariffEntryType . . . 74
8.2.45 ISO15118Chrg_SalesTariffEntryType_ArrayType . . . 75
8.2.46 ISO15118Chrg_SalesTariffType . . . 75
8.2.47 ISO15118Chrg_SAScheduleListType . . . 76
8.2.48 ISO15118Chrg_SAScheduleTupleType . . . 76
8.2.49 ISO15118Chrg_SelectedServiceListType . . . 77
8.2.50 ISO15118Chrg_SelectedServiceType . . . 78
8.2.51 ISO15118Chrg_ServiceCategoryType . . . 78
8.2.52 ISO15118Chrg_ServiceListType . . . 79
8.2.53 ISO15118Chrg_ServiceParameterListTypePtr . . . 79
8.2.54 ISO15118Chrg_ServiceScopeType . . . 80
8.2.55 ISO15118Chrg_StateMachineControlType . . . 80
8.2.56 ISO15118Chrg_StringType . . . 81
8.2.57 ISO15118Chrg_SubCertificatesType . . . 81
8.2.58 ISO15118Chrg_SupportedEnergyTransferModeType . . . 82
8.2.59 ISO15118Chrg_TariffDescriptionType . . . 82
8.2.60 ISO15118Chrg_UnitMultiplierType . . . 83
8.2.61 ISO15118Chrg_UnitSymbolType . . . 83
8.3 Function definitions . . . 84
8.3.1 ISO15118Chrg_Init . . . 84
8.3.2 ISO15118Chrg_DataLinkIndication . . . 84
8.3.3 ISO15118Chrg_V2GTpCopyRxData . . . 85
8.3.4 ISO15118Chrg_V2GTpCopyTxData . . . 86
8.3.5 ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg . . . 87
8.3.6 ISO15118Chrg_V2GTpRxIndication . . . 88
8.3.7 ISO15118Chrg_V2GTpSoConModeChg . . . 88
8.3.8 ISO15118Chrg_V2GTpStartOfReception . . . 89
8.3.9 ISO15118Chrg_V2GTpTxConfirmation . . . 90
8.4 Scheduled functions . . . 90
8.4.1 ISO15118Chrg_MainFunction_Rx . . . 91
8.4.2 ISO15118Chrg_MainFunction_Tx . . . 91
8.5 Expected interfaces . . . 92
8.5.1 Mandatory Interfaces . . . 92
8.5.2 Optional Interfaces . . . 93
8.5.3 Callout Interfaces . . . 93
8.5.4 Configurable Interfaces . . . 94
8.6 Service Interfaces . . . 94
8.6.1 Charge Parameters . . . 94
8.6.2 Charge Control . . . 107
8.7 Ports Interfaces . . . 108

8.7.1 Required Service Port . . . 108
8.7.2 Provided Service Port . . . 109
9 Sequence diagrams 110
9.1 Data Link Indication . . . 110
9.2 Start IP Address Assignment . . . 110
9.3 SECC Discovery Process . . . 111
9.4 Transmission . . . 112
9.5 Reception . . . 113
10 Configuration specification 114
10.1 How to read this chapter . . . 114
10.2 Containers and configuration parameters . . . 114
10.2.1 ISO15118Chrg . . . 114
10.2.2 ISO15118ChrgGeneral . . . 115
10.2.3 ISO15118ChrgTimer . . . 117
10.2.4 ISO15118ChrgV2GTP . . . 118
10.2.5 ISO15118ChrgService . . . 122
10.3 Published Information . . . 123
A Change history of AUTOSAR traceable items 124
A.1 Traceable item history of this document according to AUTOSAR Release R26-11 . . . 124
A.1.1 Added Specification Items in R26-11 . . . 124
A.1.2 Changed Specification Items in R26-11 . . . 124
A.1.3 Deleted Specification Items in R26-11 . . . 124
A.2 Traceable item history of this document according to AUTOSAR Release R25-11 . . . 124
A.2.1 Added Specification Items in R25-11 . . . 124
A.2.2 Changed Specification Items in R25-11 . . . 124
A.2.3 Deleted Specification Items in R25-11 . . . 125
A.3 Traceable item history of this document according to AUTOSAR Release R24-11 . . . 125
A.3.1 Added Specification Items in R24-11 . . . 125
A.3.2 Changed Specification Items in R24-11 . . . 128
A.3.3 Deleted Specification Items in R24-11 . . . 128
A.4 Traceable item history of this document according to AUTOSAR Release R23-11 . . . 129
A.4.1 Added Specification Items in R23-11 . . . 129
A.4.2 Changed Specification Items in R23-11 . . . 130
A.4.3 Deleted Specification Items in R23-11 . . . 130

Known Limitations

Currently the Charging Manager does not support the following:

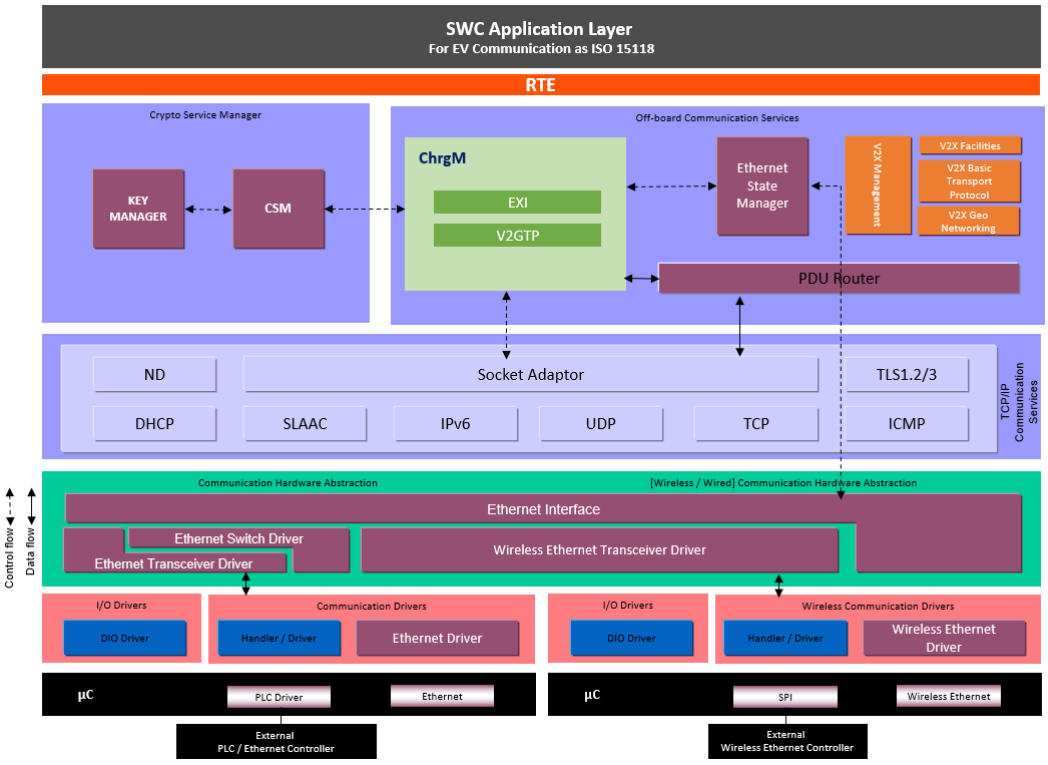
- Wireless charging as per [1]
- Bi-directional charging as per [1]
- Charging over CAN as per Chademo
- Charging over LIN

1 Introduction and functional overview

This specification describes the functionality, API and the configuration for the AUTOSAR Basic Software module ISO15118Chrg. The charging module (ISO15118Chrg) belongs to the service layer of the AUTOSAR layered architecture.

The ISO15118Chrg implements the V2GTP (vehicle to grid transport protocol) and the EXI (efficient XML interchange), the V2GTP defines the structure of the PDU; which is the header and payload definitions. The EXI is responsible for compression of the XML data for faster processing. The ISO15118Chrg module communicates with the Crypto stack to support data authentication and encryption, as well as certificate management and verification.

Refer to chapter 5 for ISO15118Chrg interaction with other modules. The figure given below describes the architecture:



AUTOSAR Layered Architecture

2 Acronyms and Abbreviations

The glossary below includes the relevant acronyms and abbreviations.

Abbreviation / Acronym:	Description:
ISO15118-2 Charging Manager	Charging Manager
V2GTP	Vechile to Grid Transport Protocol
EVCC	Electric Vehicle Communcation Controller
SECC	Supply Equipment Communcation Controller
HLC	High Level Communcation
EVSE	Electrical Vehicle Supply Equipment
SDP	SECC Discovery Protocol
PLC	Pilot Line Communcation
EV	Electric Vehicle
CCS	Combined Charging System
EXI	Efficient XML Interchange
eMAID	e-Mobility Account Identifier
EIM	External Identification Means

Table 2.1: Acronyms and abbreviations used in the scope of this Document

3 Related documentation

3.1 Input documents

[1] ISO 15118-20: Road Vehicles – Vehicle to Grid Interface – Part 20: 2nd Generation Network and Application Protocol Requirements

[2] ISO 15118-2: Road Vehicles – Vehicle to Grid Interface – Part 2: Network and Application Protocol Requirements

[3] General Requirements on Basic Software Modules
AUTOSAR_CP_RS_BSWGeneral

[4] Specification of Socket Adaptor
AUTOSAR_CP_SWS_SocketAdaptor

[5] Specification of PDU Router
AUTOSAR_CP_SWS_PDURouter

[6] Specification of Ethernet State Manager
AUTOSAR_CP_SWS_EthernetStateManager

[7] Specification of Basic Software Mode Manager
AUTOSAR_CP_SWS_BSWModeManager

[8] Specification of RTE Software
AUTOSAR_CP_SWS_RTE

[9] Specification of ECU State Manager
AUTOSAR_CP_SWS_ECUStateManager

[10] ISO 15118-3: Road Vehicles – Vehicle to Grid Interface – Part 3: Physical and Data Link Requirements

[11] Specification of Key Manager
AUTOSAR_CP_SWS_KeyManager

[12] Specification of Crypto Service Manager
AUTOSAR_CP_SWS_CryptoServiceManager

[13] General Specification of Basic Software Modules
AUTOSAR_CP_SWS_BSWGeneral

[14] System Template
AUTOSAR_CP_TPS_SystemTemplate

3.2 Related Standards

ISO15118-2: Road vehicles Vehicle to Grid Communication Interface, Network and application protocol requirements.

4 Constraints and assumptions

4.1 Limitations

The ISO15118Chrg module (charging manager) supports communication between the EV and the EVSE as per the standard ISO-15118, other communication standards such as CAN, LIN, FlexRay are not supported. The wireless and the wired ethernet and transceiver drivers must be configured to support IEEE802.1X and HomePlugPHY standards respectively. The ISO15118Chrg module does not support bi-directional charging.

4.2 Applicability to car domains

The ISO15118Chrg module can be used wherever wired and wireless charging over ethernet is used.

5 Dependencies to other modules

5.1 ECU State Manager (EcuM)

The EcuM module intializes the ISO15118Chrg module.

5.2 Basic Software Mode Manager (BswM)

The ISO15118Chrg module will notify the BswM about the mode changes of the ethernet network(s).

5.3 BSW Scheduler (SchM)

The BSW Scheduler module calls the main function of the ISO15118Chrg module.

5.4 Ethernet State Manager (EthSM)

The Ethernet state manager (EthSM) will notify the ISO15118Chrg module about the communication modes of the ethernet network(s).

5.5 Socket Adaptor (SoAd)

The socket adaptor is the upper layer of the TCPIP stack and is used by the ISO15118Chrg module for opening and closing of sockets for TCP and UDP connections.

5.6 TcpIp

The TCPIP stack will be used by the ISO15118Chrg module to provide services such as TCP, UDP, ICMPv6, SLAAC, DHCP, NDP, etc.

5.7 Ethernet Interface (EthIf)

The ethernet interface provides APIs to access the ethernet drivers and the ethernet transceiver drivers. It also provides APIs to the TCPIP stack for transmission and reception of TCP and UDP packets.

5.8 Ethernet Driver (EthDrv)

The ethernet driver is used to configure the ethernet controller, as per the concept [2] it must support HomePlugPHY standard.

5.9 Ethernet Transceiver Driver (EthTrcv)

The ethernet transceiver driver provides the APIs to configure the ethernet transceiver, which transmits and receives data to and from the ethernet bus.

5.10 Crypto Service Module (Csm)

The ISO15118Chrg module will use the services of the crypto module to support encryption and decryption of messages.

5.11 Key Manager (KeyM)

The ISO15118Chrg module will use the services of the KeyManager to support certificate management and verfication.

6 Requirements Traceability

The following tables reference the requirements specified in [3] and links to the fulfillment of these. Please note that if column “Satisfied by” is empty for a specific requirement this means that this requirement is not fulfilled by this document.

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_ISO15118Chrg_00119]
[SRS_BSW_00301]	All AUTOSAR Basic Software Modules shall only import the necessary information	[CP_SWS_ISO15118Chrg_00115]
[SRS_BSW_00305]	Data types naming convention	[CP_SWS_ISO15118Chrg_00116] [CP_SWS_ISO15118Chrg_00149] [CP_SWS_ISO15118Chrg_00150] [CP_SWS_ISO15118Chrg_00151] [CP_SWS_ISO15118Chrg_00152] [CP_SWS_ISO15118Chrg_00153] [CP_SWS_ISO15118Chrg_00154] [CP_SWS_ISO15118Chrg_00155] [CP_SWS_ISO15118Chrg_00156] [CP_SWS_ISO15118Chrg_00157] [CP_SWS_ISO15118Chrg_00158] [CP_SWS_ISO15118Chrg_00159] [CP_SWS_ISO15118Chrg_00160] [CP_SWS_ISO15118Chrg_00161] [CP_SWS_ISO15118Chrg_00162] [CP_SWS_ISO15118Chrg_00163] [CP_SWS_ISO15118Chrg_00164] [CP_SWS_ISO15118Chrg_00165] [CP_SWS_ISO15118Chrg_00166] [CP_SWS_ISO15118Chrg_00167] [CP_SWS_ISO15118Chrg_00168] [CP_SWS_ISO15118Chrg_00169] [CP_SWS_ISO15118Chrg_00170] [CP_SWS_ISO15118Chrg_00171] [CP_SWS_ISO15118Chrg_00172] [CP_SWS_ISO15118Chrg_00173] [CP_SWS_ISO15118Chrg_00174] [CP_SWS_ISO15118Chrg_00175] [CP_SWS_ISO15118Chrg_00176] [CP_SWS_ISO15118Chrg_00177] [CP_SWS_ISO15118Chrg_00178] [CP_SWS_ISO15118Chrg_00179] [CP_SWS_ISO15118Chrg_00180] [CP_SWS_ISO15118Chrg_00181] [CP_SWS_ISO15118Chrg_00182] [CP_SWS_ISO15118Chrg_00183] [CP_SWS_ISO15118Chrg_00184] [CP_SWS_ISO15118Chrg_00185] [CP_SWS_ISO15118Chrg_00186] [CP_SWS_ISO15118Chrg_00187] [CP_SWS_ISO15118Chrg_00188] [CP_SWS_ISO15118Chrg_00189] [CP_SWS_ISO15118Chrg_00190] [CP_SWS_ISO15118Chrg_00191] [CP_SWS_ISO15118Chrg_00192] [CP_SWS_ISO15118Chrg_00193] [CP_SWS_ISO15118Chrg_00194] [CP_SWS_ISO15118Chrg_00195] [CP_SWS_ISO15118Chrg_00196] ▽

▽

△

Requirement	Description	Satisfied by
		△ [CP_SWS_ISO15118Chrg_00197] [CP_SWS_ISO15118Chrg_00198] [CP_SWS_ISO15118Chrg_00199] [CP_SWS_ISO15118Chrg_00201] [CP_SWS_ISO15118Chrg_00202] [CP_SWS_ISO15118Chrg_00203] [CP_SWS_ISO15118Chrg_00204] [CP_SWS_ISO15118Chrg_00205] [CP_SWS_ISO15118Chrg_00206] [CP_SWS_ISO15118Chrg_00207] [CP_SWS_ISO15118Chrg_00208] [CP_SWS_ISO15118Chrg_00209] [CP_SWS_ISO15118Chrg_00210] [CP_SWS_ISO15118Chrg_00211] [CP_SWS_ISO15118Chrg_00212] [CP_SWS_ISO15118Chrg_00214]
[SRS_BSW_00310]	API naming convention	[CP_SWS_ISO15118Chrg_00119] [CP_SWS_ISO15118Chrg_00122] [CP_SWS_ISO15118Chrg_00125] [CP_SWS_ISO15118Chrg_00128] [CP_SWS_ISO15118Chrg_00131] [CP_SWS_ISO15118Chrg_00133] [CP_SWS_ISO15118Chrg_00140] [CP_SWS_ISO15118Chrg_00141] [CP_SWS_ISO15118Chrg_00143] [CP_SWS_ISO15118Chrg_00145] [CP_SWS_ISO15118Chrg_00146]
[SRS_BSW_00323]	All AUTOSAR Basic Software Modules shall check passed API parameters for validity	[CP_SWS_ISO15118Chrg_00113]
[SRS_BSW_00337]	Classification of development errors	[CP_SWS_ISO15118Chrg_00113]
[SRS_BSW_00350]	All AUTOSAR Basic Software Modules shall allow the enabling/disabling of detection and reporting of development errors.	[CP_SWS_ISO15118Chrg_00113]
[SRS_BSW_00358]	The return type of init() functions implemented by AUTOSAR Basic Software Modules shall be void	[CP_SWS_ISO15118Chrg_00119]
[SRS_BSW_00384]	The Basic Software Module specifications shall specify at least in the description which other modules they require	[CP_SWS_ISO15118Chrg_00147] [CP_SWS_ISO15118Chrg_00148]
[SRS_BSW_00414]	Init functions shall have a pointer to a configuration structure as single parameter	[CP_SWS_ISO15118Chrg_00119]
[SRS_BSW_00438]	Configuration data shall be defined in a structure	[CP_SWS_ISO15118Chrg_00116]
[SRS_BSW_00452]	Classification of runtime errors	[CP_SWS_ISO15118Chrg_00114]

Table 6.1: Requirements Tracing

7 Functional specification

The Charging Manager (ISO15118Chrg) module enables the charging process between the supply equipment (EVSE) and the vehicle (EV), the charging process is based upon the standard [2, ISO 15118-2], which supports both AC and DC charging with the option of 2 payment methods PnC (plug and charge) and EIM (external identification means). The communication between the EV (electric vehicle) and the EVSE (electric vehicle suppy equipment) is established using two modems on each side, these modems are configured as per the HomePlugPHY standard.

7.1 Charging Manager (ISO15118Chrg) Overview

The ISO15118Chrg (charging module) is introduced in the AUTOSAR layered architecture as a communication module in the service layer and it controls the charging process using different sets of messages. It provides interfaces to communicate with the upper layer, and the lower layers such as the socket adaptor [4, Socket Adaptor] and the [5, PDU Router]. The ISO15118Chrg also communicates with the ethernet state manager [6, Ethernet State Manager], the basic software mode manager [7, BSW Mode Manager], the basic software scheduler [8, RTE] and the [9, Ecu State Manager].

The process of charging begins when the vehicle plugs itself in the supply equipment, the EVCC (electric vehicle communication controllers) senses a voltage at the CP line, an application software SwC needs to poll this CP line, once a voltage is sensed, the SwC will inform the ISO15118Chrg via the operation `SetCpLineStatus`. This marks the beginning of the charging process. For different states of the CP line, refer to ISO15118–1.

The EVCC then establishes a data link connection with the SECC, once the data link is established it informs the ISO15118Chrg. The charging interface used in the European Union is the CCS-Type2. The exchange of messages between the vehicle and the supply equipment will take place over the PP and CP lines of the CCS-Type2 connector, and it is called Pilot Line Communication (PLC), the EVCC and the SECC must comply with [10, ISO 15118-3] for data link connection.

The high-level architecture is given in the Chapter 1.

7.2 Charging Manager General Requirements

[CP_SWS_ISO15118Chrg_00001] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall provide service interfaces to the upper layer, through which the request and response messages shall be exchanged.⌋

[CP_SWS_ISO15118Chrg_00002] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall be able to create the V2G message from the dataPtr it receives in the request message from the upper layer.⌋

[CP_SWS_ISO15118Chrg_00003] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall implement EXI encoding and decoding as per [2, ISO 15118-2].⌋

[CP_SWS_ISO15118Chrg_00004] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall implement the V2GTP as per [2, ISO 15118-2]. The V2GTP is the standard communication protocol between the EV and the EVSE.⌋

[CP_SWS_ISO15118Chrg_00005] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall provide the following timers with their respecitve timeouts as per [2, ISO 15118-2]:

- V2G_EVCC_CommunicationSetup_Timer : Communication Setup Timer in the EVCC
- V2G_EVCC_CommunicationSetup_Timeout : Timeout for the Communication Setup Timer
- V2G_EVCC_CableCheck_Timer : Cable Check Timer in the EVCC
- V2G_EVCC_CableCheck_Timeout : Timeout for the CableCheck Timer
- V2G_EVCC_PreCharge_Timer : PreCharge Timer in the EVCC
- V2G_EVCC_Precharge_Timeout : Timeout for the PreCharge Timer
- V2G_EVCC_Ongoing_Timer : Ongoing Timer in the EVCC
- V2G_EVCC_Ongoing_Timeout : Timeout for Ongoing Timer in the EVCC
- ISO15118ChrgV2G_EVCC_Msg_Timer : Timer for message request-response pair.
- ISO15118ChrgV2G_EVCC_Msg_Timeout : Timeout for the Message Time. This is the timee between a request-response pair.
- ISO15118Chrg_SDPTimer : Timer for SDP message.
- ISO15118Chrg_SDPTimerTimeout : Timeout for SDP message.

⌋

Note: Positive response codes start with 'OK', Negative response codes with 'FAILED'.

7.2.1 Transmission of Charging Control Messages

[CP_SWS_ISO15118Chrg_00006] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall encode the V2G message into the EXI format, upon successful EXI encoding, the ISO15118Chrg shall then pack this EXI stream into the V2GTP format as mentioned in [2, ISO15118-2].⌋

[CP_SWS_ISO15118Chrg_00007] General Requirement

Status: DRAFT

⌈If there is an error during the EXI encoding operation, then the ISO15118Chrg shall inform the upper layer with an error message and shall stop the charging process and go to the state `ISO15118Chrg_Init`.⌋

[CP_SWS_ISO15118Chrg_00008] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall send the V2GTPPDU to the lower layer by calling `PduR_<User:Up>Transmit`. The ISO15118Chrg shall also start the timer `ISO15118ChrgV2G_EVCC_Msg_Timer` when it sends the 'Request' message.⌋

[CP_SWS_ISO15118Chrg_00009] General Requirement

Status: DRAFT

⌈If there is an error during the V2GTP formatting process, then the ISO15118Chrg shall inform the upper layer with an error message and shall stop the V2G session, and go to the state `ISO15118Chrg_Init`.⌋

7.2.2 Reception of Charging Control Messages

[CP_SWS_ISO15118Chrg_00010] General Requirement

Status: DRAFT

⌈Upon reception of message from the lower layer, the ISO15118Chrg shall perform header checks in accordance with the V2GTP as mentioned in [2, ISO15118-2].⌋

[CP_SWS_ISO15118Chrg_00011] General Requirement

Status: DRAFT

⌈If the header checks are successful and the response code starts with 'OK', and all timeouts are respected, then the ISO15118Chrg shall:

- Decode received EXI encoded message,

- Reset the timer ISO15118ChrgV2G_EVCC_Msg_Timer,
- Send the complete message (header + payload) to the upper layer,
- Wait for the next message to be triggered

⌋

[CP_SWS_ISO15118Chrg_00012] General Requirement

Status: DRAFT

⌈If timeouts are respected and the header checks are unsuccessful then the ISO15118Chrg shall:

- Discard the received PDU,
- Inform the upper layer with an error message,
- Stop the charging process an go to state Init,
- Reset the timer ISO15118ChrgV2G_EVCC_Msg_Timer,
- Reset the timer V2G_EVCC_CableCheck_Timer,
- Reset the timer V2G_EVCC_PreCharge_Timer,
- Reset the timer V2G_EVCC_Ongoing_Timer,
- Close the TCP-TLS connection by calling SoAd_CloseSoCon,
- Release the IP address by calling SoAd_ReleaseIpAddrAssignment,
- Delete the SECC IP address and Port Number

⌋

[CP_SWS_ISO15118Chrg_00013] General Requirement

Status: DRAFT

⌈If the header checks are successful, all timeouts are respected, and response code starts with 'FAILED' then the ISO15118Chrg shall:

- Discard the received PDU,
- Inform the upper layer with an error message,
- Stop the charging process and go to state Init,
- Reset the timer ISO15118ChrgV2G_EVCC_Msg_Timer,
- Reset the timer V2G_EVCC_CableCheck_Timer,
- Reset the timer V2G_EVCC_PreCharge_Timer,
- Reset the timer V2G_EVCC_Ongoing_Timer,
- Close the TCP-TLS connection by calling SoAd_CloseSoCon,

- Release the IP address by calling SoAd_ReleaseIpAddrAssignment,
- Delete the SECC IP address and Port Number

⌋

[CP_SWS_ISO15118Chrg_00014] General Requirement

Status: DRAFT

⌈If any timer exceeds its respective timeout, then:

- Discard the received PDU,
- Inform the upper layer with an error message,
- Stop the charging process and go to state Init,
- Reset the timer ISO15118ChrgV2G_EVCC_Msg_Timer,
- Reset the timer V2G_EVCC_CableCheck_Timer,
- Reset the timer V2G_EVCC_PreCharge_Timer,
- Reset the timer V2G_EVCC_Ongoing_Timer,
- Close the TCP-TLS connection by calling SoAd_CloseSoCon,
- Release the IP address by calling SoAd_ReleaseIpAddrAssignment,
- Delete the SECC IP address and Port Number

⌋

[CP_SWS_ISO15118Chrg_00217] General Requirement

Status: DRAFT

⌈The ISO15118Chrg provides the operation StateParams using which, the states of the ISO15118Chrg shall be controlled.⌋

[CP_SWS_ISO15118Chrg_00218] General Requirement

Status: DRAFT

⌈Using the operations SessionSetupParams and SessionStopParams, the charging session shall be started or stopped.⌋

[CP_SWS_ISO15118Chrg_00219] General Requirement

Status: DRAFT

⌈ISO15118Chrg provides the operation ErrorNotification, using which the ISO15118Chrg shall report errors to the upper layer.⌋

7.3 ISO15118Chrg Connection Setup

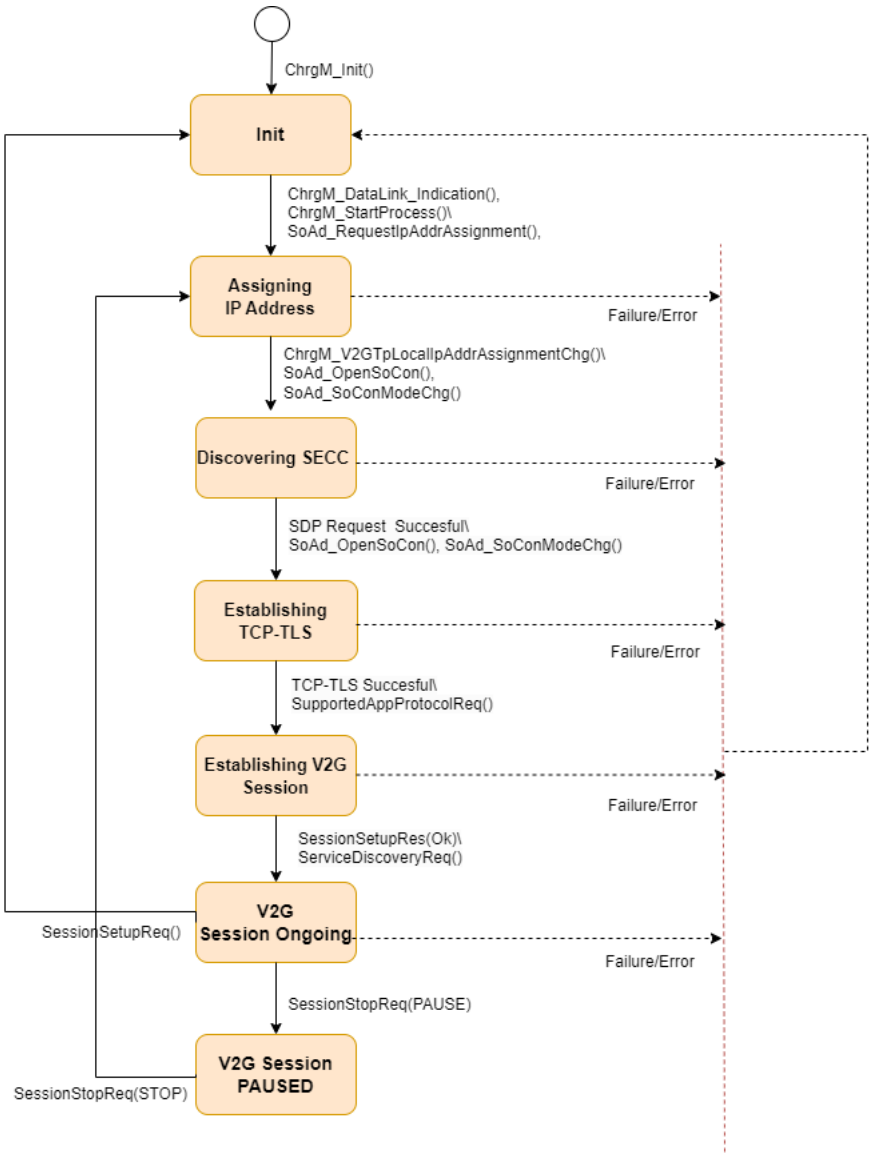


Figure 7.1: ISO15118ChrgStateMachine

[CP_SWS_ISO15118Chrg_00015] General Requirement

Status: DRAFT

⌈The ISO15118Chrg controls the state machine as given in Figure which shall contain the following states:

- Init : Initialization of the ISO15118Chrg module.
- Assigning IP address : Initiates the process of assigning IP address..
- Discovering SECC : ISO15118Chrg establishing UDP connection and discovering the SECC IP address and Port number.
- Establishing TCP-TLS : ISO15118Chrg establishing TCP-TLS connection.

- Establishing V2G Session : ISO15118Chrg establishing V2G session.
- V2G Session Ongoing : ISO15118Chrg in V2G session.
- V2G Session Paused : ISO15118Chrg pausing V2G session.

⌋

[CP_SWS_ISO15118Chrg_00016] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall move to the state `Init` when a call to `ISO15118Chrg_Init` is made.⌋

[CP_SWS_ISO15118Chrg_00017] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state `Init`, if:

- `ISO15118Chrg_DataLinkIndication` is called with 'ETHTRCV_LINK_STATE_ACTIV', and
- The operation `SetChargeState` is called with parameter StateMachine control set to 'ISO15118_START',

then, the ISO15118Chrg shall move to the state `Assigning IP Address` by calling `SoAd_RequestIpAddrAssignment` with parameters SoConId which the ISO15118Chrg shall get from `ISO15118ChrgSoAdSocketConnectionRef`, Type, LocalIpAddrPtr, Netmask and DefaultRouterPtr. The ISO15118Chrg shall start the timer `V2G_EVCC_CommunicationSetup_Timer`.⌋

[CP_SWS_ISO15118Chrg_00018] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state `Assigning IP Address`, if:

- `ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg` returns 'TCPIP_IPADDR_STATE_ASSIGNED',

then, the ISO15118Chrg shall move to the state `Discovering SECC` by calling `SoAd_OpenSoCon` to open a UDP socket and wait for the response to`SoAdSoConModeChg`. If `SoAdSoConModeChg` returns 'SOAD_SOCON_ONLINE', then the ISO15118Chrg shall send a SDP request message using the source port as V2G_UDP_SDP_CLIENT and the destination port as V2G_UDP_SDP_SERVER. The socket connection referenced by the parameter `ISO15118ChrgV2GUdpSdpClientRef` shall be configured with the ports V2G_UDP_SDP_CLIENT, V2G_UDP_SDP_SERVER as per [2, ISO 15118-2].⌋

[CP_SWS_ISO15118Chrg_00076] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall use a separate UDP packet for each request message.⌋

[CP_SWS_ISO15118Chrg_00019] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall wait for at least 250ms after sending each SDP request message, the timer `ISO15118Chrg_SDPTimer` shall be implemented for this. After this timer expires, a new SDP request message shall be sent and the counter shall be incremented.⌋

[CP_SWS_ISO15118Chrg_00020] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state `Assigning IP Address`, if:

- `SoAdSoConModeChg` Returns 'SOAD_SOCON_OFFLINE'
- `ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg` Does not return 'TCPIP_IPADDR_STATE_ASSIGNED', or
- `V2G_EVCC_CommunicationSetup_Timer` Exceeds the `V2G_EVCC_CommunicationSetup_Timeout`, or
- `ISO15118Chrg_DataLinkIndication` States 'ETHTRCV_LINK_STATE_INACTIV', or
- Operation `SetCpLineStatus` returns 'INACTIVE', or

then, the ISO15118Chrg shall stop the charging process and move to the state `Init`. The ISO15118Chrg shall also inform the upper layer with an error message.⌋

[CP_SWS_ISO15118Chrg_00021] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state `Discovering SECC`, if:

- A valid SECC IP address and Port Number are received

then, the ISO15118Chrg shall move to the state `Establishing TCP-TLS` by calling `SoAd_OpenSoCon` to open a TCP socket and wait for the response to `SoAdSoConModeChg`. If, `SoAdSoConModeChg` returns 'SOAD_SOCON_ONLINE', then the ISO15118Chrg shall establish a TLS connection over this TCP socket and close the previous UDP connection by calling `SoAd_CloseSoCon`.⌋

[CP_SWS_ISO15118Chrg_00022] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state `Discovering SECC`, if:

- A valid SECC IP address and Port Number are not received, or
- SDP header checks fail, or
- TLS versions are not compatible, or

- V2G_EVCC_CommunicationSetup_Timer Exceeds the V2G_EVCC_CommunicationSetup_Timeout, or
- ISO15118Chrg_DataLinkIndication States 'ETHTRCV_LINK_STATE_INACTIV', or
- Operation SetCpLineStatus returns 'INACTIVE', or

then, the ISO15118Chrg shall:

- Close the UDP socket by calling SoAd_CloseSoCon,
- Release the IP address by calling SoAd_ReleaseIpAddrAssignment,
- Stop the charging process by going to the state Init,
- Inform the upper layer with an error message

⌋

[CP_SWS_ISO15118Chrg_00078] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall only support the message set EIM if TLS is not available. TLS comptibility can be checked in the SDP response message.⌋

[CP_SWS_ISO15118Chrg_00023] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state Establishing TCP-TLS, if:

- TCP-TLS connection was succesfully established,

then, then the ISO15118Chrg shall trigger the message 'SupportedAppProtocolReq' to initiate the establishment of the V2G session and go to the state Establishing V2G Session. The ISO15118Chrg shall start the timer ISO15118ChrgV2G_EVCC_Msg_Timer when this message is triggered.⌋

[CP_SWS_ISO15118Chrg_00024] General Requirement

Status: DRAFT

⌈While the ISO15118Chrg is in the state Establishing TCP-TLS, if:

- TCP-TLS connection could not be established, or
- V2G_EVCC_CommunicationSetup_Timer Exceeds the V2G_EVCC_CommunicationSetup_Timeout, or
- ISO15118Chrg_DataLinkIndication States 'ETHTRCV_LINK_STATE_INACTIV', or
- Operation SetCpLineStatus returns 'INACTIVE', or

then, then the ISO15118Chrg shall:

- Close the TCP socket by calling `SoAd_CloseSoCon`,
- Release the IP address by calling `SoAd_ReleaseIpAddrAssignment`,
- Stop the charging process by going to the state `Init`,
- Inform the upper layer with an error message

⌋

[CP_SWS_ISO15118Chrg_00079] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall ensure that if a previously established TLS session is switched off, then the charging process shall stop. The user shall be notified with an error message.⌋

[CP_SWS_ISO15118Chrg_00080] General Requirement

Status: DRAFT

⌈During the TLS handhshake process, the received SECC certificate or certificate chain shall be verified by calling `KeyM_VerifyCertificate` as mentioned in [11, KeyManager].⌋

[CP_SWS_ISO15118Chrg_00081] General Requirement

Status: DRAFT

⌈During the TLS handhshake a list of all supported V2G root certificates shall be sent to the SECC.⌋

[CP_SWS_ISO15118Chrg_00082] General Requirement

Status: DRAFT

⌈During the TLS handhshake, encryption and decryption mechanism shall be applied as mentioned in [2, ISO-15118-2].⌋

[CP_SWS_ISO15118Chrg_00025] General Requirement

Status: DRAFT

⌈While in the state `Establishing V2G Session`, if the response message 'SupportedAppProtocolRes' is returned with 'Ok', then the ISO15118Chrg shall trigger the next message 'SessionSetupReq' and shall wait for the response. If the response 'SupportedAppProtocolRes' is returned with 'FAILED' then the ISO15118Chrg shall:

- Close the TCP socket by calling `SoAd_CloseSoCon`,
- Release the IP address by calling `SoAd_ReleaseIpAddrAssignment`,
- Stop the charging process by going to the state `Init`,
- Inform the upper layer with an error message

⌋

[CP_SWS_ISO15118Chrg_00026] General Requirement

Status: DRAFT

⌈While in the state `Establishing V2G Session`, if the response message 'SessionSetupRes' is returned with 'Ok', then a call to the message 'ServiceDetailReq' shall take the ISO15118Chrg to the state `V2G Session Ongoing`. If the response 'SessionSetupRes' is returned with 'FAILED' then the ISO15118Chrg shall:

- Close the TCP socket by calling `SoAd_CloseSoCon`,
- Release the IP address by calling `SoAd_ReleaseIpAddrAssignment`,
- Stop the charging process by going to the state `Init`,
- Inform the upper layer with an error message

⌋

[CP_SWS_ISO15118Chrg_00215] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall acquire SLAC information using the operation `SlacStateParams`.⌋

[CP_SWS_ISO15118Chrg_00216] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall acquire SECC and TLS related information using the operation `SeccConnectionParams`.⌋

[CP_SWS_ISO15118Chrg_00220] General Requirement

Status: DRAFT

⌈Using the operation `SupportedAppProtocolParams`, the supportedAppProtocol parameters shall be fetched.⌋

7.4 ISO15118Chrg Charging Control Messages

The ISO15118Chrg has two sets of messages to control AC and DC charging. It also offers two different sets of messages depending on whether EiM or PnC is selected as a payment method.

7.4.1 General Control Messages

The message set for AC charging EiM is as follows:

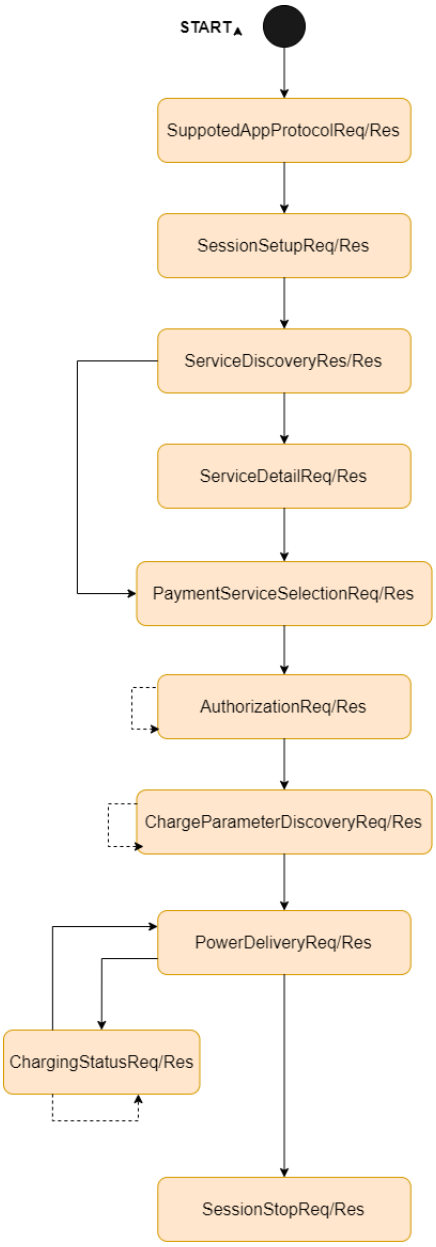


Figure 7.2: AC EIM

The message set for AC charging PnC is as follows:

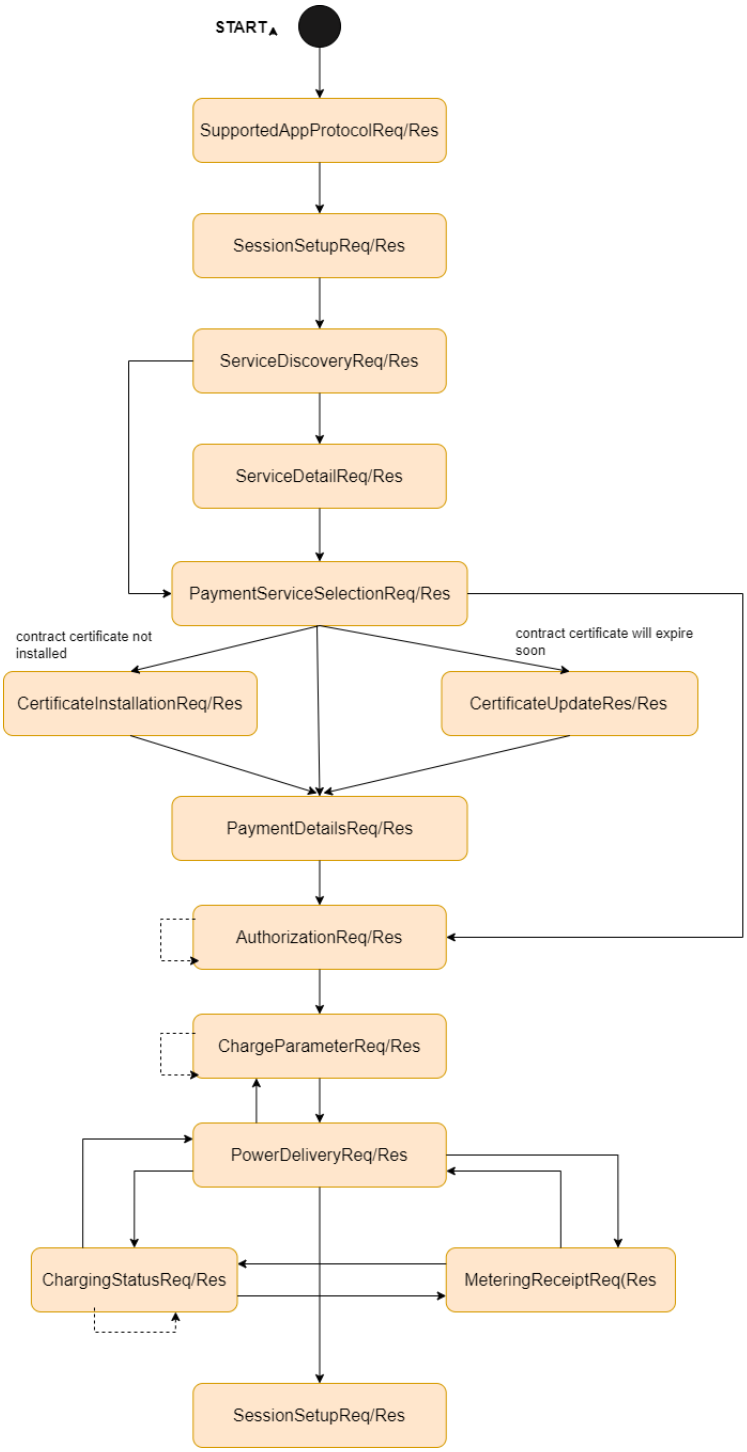


Figure 7.3: AC PNC

[CP_SWS_ISO15118Chrg_00027] General Requirement

Status: DRAFT

⌈Through the operation `ServiceDiscoveryParams`, the message 'ServiceDiscoveryReq' shall be triggered while the ISO15118Chrg is in the state `V2G Session Ongoing`. Then the ISO15118Chrg shall proceed as per requirements

[CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008], [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00028] General Requirement

Status: DRAFT

⌈Upon reception of the response message 'ServiceDiscoveryRes', the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00029] General Requirement

Status: DRAFT

⌈Once the message 'ServiceDiscoveryRes' has been processed succesfully, a call to the operation `ServiceDetailParams`, shall trigger the message 'ServiceDetailReq'. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00030] General Requirement

Status: DRAFT

⌈Upon reception of the response message 'ServiceDetailRes', the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00031] General Requirement

Status: DRAFT

⌈The message 'ServiceDetailReq' shall be triggered again if further ServiceDetailReq are necessary to retrieve the detailed information from the SECC.⌋

Note: If the EVSE does not offer a list of services, then the message 'ServiceDetailReq' shall be skipped and the next message shall be triggered.

[CP_SWS_ISO15118Chrg_00032] General Requirement

Status: DRAFT

⌈Once the message 'ServiceDetailRes' or 'ServiceDiscoveryReq' has been processed succesfully, the a call to the operation `PaymentServiceSelectionParams`, shall trigger the message 'PaymentServiceSelectionReq'. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00033] General Requirement

Status: DRAFT

⌈Upon reception of the response message 'PaymentServiceSelectionRes', the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00034] General Requirement

Status: DRAFT

⌈If the the payment option is 'AC Charging PnC or DC Charging PnC' and there is no intention to use message sets 'CertificateInstallationReq' and 'Certificate-UpdateReq', then the message 'PaymentDetailsReq' shall be triggered through the operation `PaymentDetailsParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00035] General Requirement

Status: DRAFT

⌈Upon reception of the response message 'PaymentDetailRes', the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00036] General Requirement

Status: DRAFT

⌈Upon succesfully processing the response message 'PaymentServiceSelectionRes', the message 'CertificateInstallationReq' shall be triggered by the ISO15118Chrg itself, if the response message 'ServiceDetailRes' indicated that Certificate Installation is available and if the message set 'Certificate Installation' is to be used. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00086] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall digitally sign all fields of the EXI encoded message 'CertificateInstallationReq' using the signature from the OEM provisioning certificate.⌋

[CP_SWS_ISO15118Chrg_00037] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CertificateInstalltionRes' the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_

ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. Then the message 'PaymentDetailsReq' shall then be triggered.⌋

[CP_SWS_ISO15118Chrg_00090] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall decrypt the field ContractSignatureEncryptedPrivateKey in the response message 'CertificateInstallationRes' by calling `Csm_Decrypt` of the [12, CryptoServiceManager].⌋

[CP_SWS_ISO15118Chrg_00038] General Requirement

Status: DRAFT

⌈Upon succesfully processing the response message 'PaymentServiceSelectionRes', the the message 'CertificateUpdateReq' shall be triggered by the ISO15118Chrg itself, if the response message 'ServiceDetailRes' indicated that Certificate Update is available and if the message set 'Certificate Update' is to be used. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00085] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall digitally sign all fields of the EXI encoded message 'CertificateUpdateReq' using the signature from the contract certificate.⌋

[CP_SWS_ISO15118Chrg_00039] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CertificateUpdateRes' the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. Then the message 'PaymentDetailsReq' shall be triggered.⌋

[CP_SWS_ISO15118Chrg_00089] General Requirement

Status: DRAFT

⌈The ISO15118Chrg decrypt the field ContractSignatureEncryptedPrivateKey in the response message 'CertificateUpdateRes' by calling `Csm_Decrypt` of the [12, CryptoServiceManager].⌋

[CP_SWS_ISO15118Chrg_00040] General Requirement

Status: DRAFT

⌈After succesfully processing the message 'PaymentDetailRes', the message 'AuthorizationReq' shall be triggered through the operation `AuthorizationParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118

Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00084] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall digitally sign all fields of the EXI encoded message 'AuthorizationReq' by using `Csm_SignatureGenerate` of the [12, CryptoServiceManager].⌋

[CP_SWS_ISO15118Chrg_00041] General Requirement

Status: DRAFT

⌈Upon reception of the response message 'AuthorizationRes', the ISO15118Chrg shall proceed per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00042] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall trigger the timer `V2G_EVCC_Ongoing_Timer` if the paramater EVSEProcessing is set to Ongoing upon reception of the first 'AuthorizationRes' message, and wait for parameter EVSEProcessing equal to Finished.⌋

[CP_SWS_ISO15118Chrg_00043] General Requirement

Status: DRAFT

⌈If the parameter EVSEProcessing is set to Finished in the response message 'AuthorizationRes' and the response message was succesfully processed, then the message 'ChargeParameterDiscoveryReq' shall be triggered through the operation `ChargeParameterDiscoveryParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00044] General Requirement

Status: DRAFT

⌈If the parameter EVSEProcessing is set to Finished in the response message 'AuthorizationRes', and the response message was succesfully processed as per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014], then the message 'ChargeParameterDiscoveryReq' shall be triggered through the operation `ChargeParameterDiscoveryParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008]

to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00045] General Requirement

Status: DRAFT

⌈If the parameter EVSEProcessing is set to Ongoing in the response message 'AuthorizationRes', and the response message was succesfully processed as per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014], then the request message 'AuthorizationReq' shall be triggered again. The consecutive 'AuthorizationReq' messages shall be sent without a Signature, Id and GenChallenge.⌋

[CP_SWS_ISO15118Chrg_00046] General Requirement

Status: DRAFT

⌈Upon reception of the message 'ChargeParameterDiscoveryRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014].⌋

[CP_SWS_ISO15118Chrg_00091] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall verify the digital signature in the message 'ChargeParameterDiscoveryRes' using `Csm_SignatureVerify` of the [12, CryptoServiceManager].⌋

[CP_SWS_ISO15118Chrg_00047] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall trigger the timer `V2G_EVCC_Ongoing_Timer` if the paramater EVSEProcessing is set to Ongoing upon reception of the first 'ChargeParameterDiscoveryRes' message, and wait for parameter EVSEProcessing equal to Finished.⌋

[CP_SWS_ISO15118Chrg_00048] General Requirement

Status: DRAFT

⌈If the parameter EVSEProcessing is set to Ongoing in the response message 'ChargeParameterDiscoveryRes', and the response message was succesfully processed as per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014], then the request message 'ChargeParameterDiscoveryReq' shall be triggered again.⌋

Note: Till here message sequence is same for AC and DC.

7.4.1.1 Control Messages for AC Charging

[CP_SWS_ISO15118Chrg_00049] General Requirement

Status: DRAFT

⌈If the parameter EVSEProcessing is set to Finished in the response message 'ChargeParameterDiscoveryRes', and the response message was succesfully processed as per the requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014], then the request message 'PowerDeliveryReq' shall be triggered through the operation `PowerDeliveryParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00050] General Requirement

Status: DRAFT

⌈Upon reception of the message 'PowerDeliveryRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the response message is succesfully processed, then the message 'ChargeStatusReq' shall be triggered through the operation `ChargingStatusParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00051] General Requirement

Status: DRAFT

⌈Upon reception of the message 'ChargeStatusRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the the response message is succesfully processed, then message 'MeteringReceiptReq' shall be triggered by the ISO15118Chrg itself, given that that parameter ReceiptRequired was set to TRUE in the response message 'ChargeStatusRes', if the parameter ReceiptRequired was set to FALSE, then the message 'ChargeStatusReq' shall be sent again.⌋

[CP_SWS_ISO15118Chrg_00052] General Requirement

Status: DRAFT

⌈Upon reception of the message 'MeteringReceiptRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. The message 'ChargeStatusReq'

shall be triggered again. The ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00053] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'ChargeStatusRes', the message 'PowerDeliveryReq' shall be triggered with the parameter ChargeProgress set to STOP, if the charging process is to be STOPPED.⌋

[CP_SWS_ISO15118Chrg_00054] General Requirement

Status: DRAFT

⌈If the message 'PowerDeliveryReq' was triggered with parameter ChargeProgress set to STOP, then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message. Upon reception and succesful processing of the response 'PowerDeliveryRes' message as per [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014], then request message 'SesssionStopReq' shall be trigegred to stop the AC charging process.⌋

Note: The following requirements are for EV initiated renegotiation.

[CP_SWS_ISO15118Chrg_00055] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'ChargeStatusRes', the charge profile can be renegotiated by sending the request message 'PowerDeliveryReq' with parameter ChargeProgess set to Renegotiate.⌋

[CP_SWS_ISO15118Chrg_00056] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'MeteringReceiptRes', the charge profile can be reneogtiated by sending the request message 'PowerDeliveryReq' with parameter ChargeProgess set to Renegotiate.⌋

Note: The following requirements are for EVSE initiated renegotiation.

[CP_SWS_ISO15118Chrg_00057] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'ChargeStatusRes', if the parameter EVSENotification in EVSEStatus was set to Renegotiate, the renegotiatiation of the charge profile shall happen by sending the request message 'PowerDeliveryReq'

with parameter ChargeProgess set to Renegotiate within the number of seconds provided in NotificationMaxDelay.]

7.4.1.2 Control Messages for DC Charging

The message set for DC charging EiM is as follows:

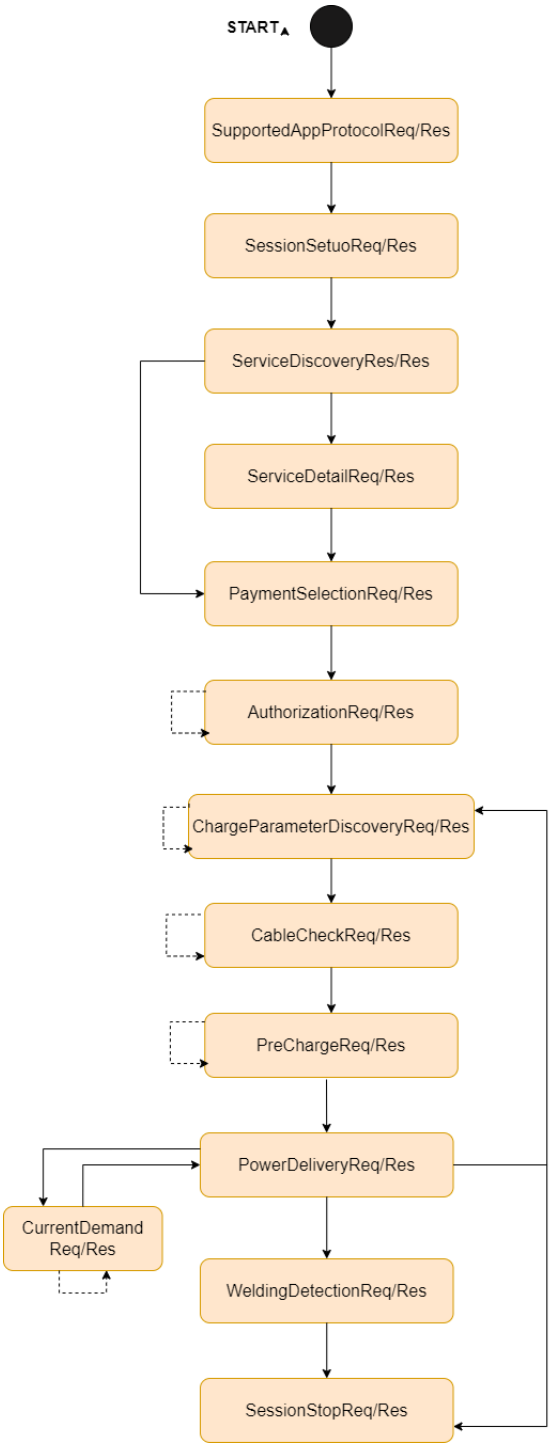


Figure 7.4: DC EIM

The message set for DC charging PnC is as follows:

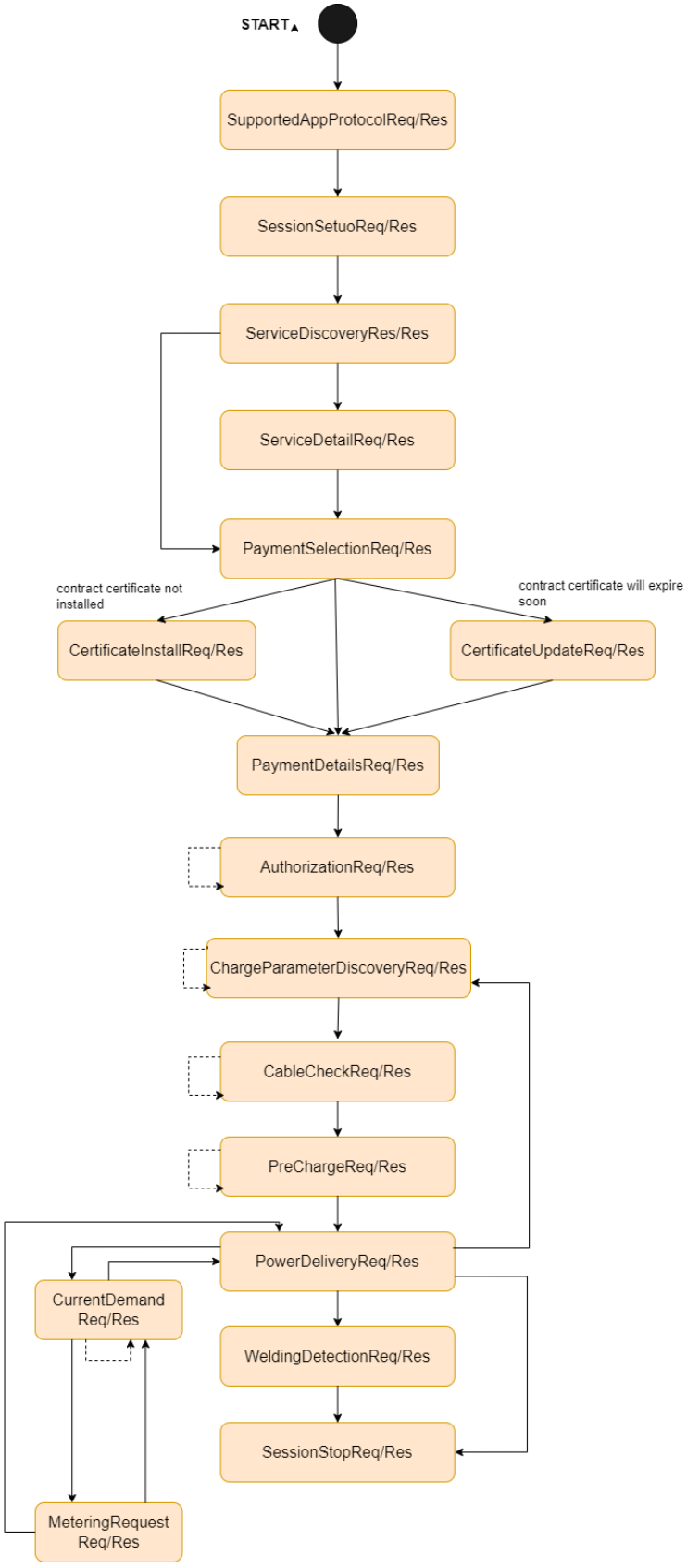


Figure 7.5: DC PNC

[CP_SWS_ISO15118Chrg_00058] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'ChargeParameterDiscoveryRes', the message 'CableCheckReq' shall be triggered through the operation `CableCheckParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00059] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CableCheckRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the response message is successfully processed, and if it contains the parameter EVSEProcessing set to Ongoing, then the message 'CableCheckReq' shall be sent again.⌋

[CP_SWS_ISO15118Chrg_00060] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall trigger the timer `V2G_EVCC_Ongoing_Timer` if the paramater EVSEProcessing is set to Ongoing upon reception of the first 'CableCheckRes' message, and wait for parameter EVSEProcessing equal to Finished.⌋

[CP_SWS_ISO15118Chrg_00061] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall trigger the timer `V2G_EVCC_CableCheck_Timer` when sending the first request message 'CableCheckReq'.⌋

[CP_SWS_ISO15118Chrg_00062] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CableCheckRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the response message is succesfully processed, and if it contains the parameter EVSEProcessing set to Finished, then the message 'PreChargeReq' shall be triggered through the operation `PreChargeParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00063] General Requirement

Status: DRAFT

⌈Upon reception of the message 'PreChargeRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed and the response contains the paramater EVSEPresentVoltage which does not fulfill the threshold requirement of the EV, then the message 'PreChargeReq' shall be sent again.⌋

[CP_SWS_ISO15118Chrg_00064] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall trigger the timer `V2G_EVCC_PreCharge_Timer` when sending the request message 'PreChargeReq' for the first time. The ISO15118Chrg shall only process the response message if the response indicates that EVSE output voltage has been adjusted to EV RESS voltage, else the ISO15118Chrg shall discard the response and stop the V2G session.⌋

[CP_SWS_ISO15118Chrg_00065] General Requirement

Status: DRAFT

⌈Upon reception of the message 'PreChargeRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed and the response contains the paramater EVSEPresentVoltage which fulfills the threshold requirement of the EV, then the message 'PowerDeliveyReq' shall be triggered through the operation `PowerDeliveryParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00066] General Requirement

Status: DRAFT

⌈Upon reception of the message 'PowerDeliveryRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed then the message 'CurrentDemandReq' shall be triggered through the operation `CurrentDemandParams`. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00067] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CurrentDemandRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed and the response contains the parameter MeteringReceipt set to TRUE, then the message 'MeteringReceiptReq' shall be triggered by the ISO15118Chrg itself. Then the ISO15118Chrg shall proceed as per requirements [CP_SWS_ISO15118Chrg_00006], [CP_SWS_ISO15118Chrg_00007], [CP_SWS_ISO15118Chrg_00008] to [CP_SWS_ISO15118Chrg_00009]. The ISO15118Chrg shall wait for the response message.⌋

[CP_SWS_ISO15118Chrg_00087] General Requirement

Status: DRAFT

⌈The ISO15118Chrg shall digitally sign all fields of the EXI encoded message 'MeteringReceiptReq' by using `Csm_SignatureGenerate` of the [12, CryptoServiceManager].⌋

[CP_SWS_ISO15118Chrg_00068] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CurrentDemandRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed and the response contains the parameter MeteringReceipt set to FALSE and if the charging process is to be continued, then the message 'CurrentDemandReq' shall be triggered again.⌋

[CP_SWS_ISO15118Chrg_00069] General Requirement

Status: DRAFT

⌈Upon reception of the message 'MeteringReceiptRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed if the charging process is to be continued, then the message 'CurrentDemandReq' shall be triggered again.⌋

[CP_SWS_ISO15118Chrg_00070] General Requirement

Status: DRAFT

⌈Upon reception of the message 'MeteringReceiptRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully pro-

cessed if the charging process is to be stopped, then the message 'PowerDeliveryReq' with the parameter ChargeProgress set to STOP shall be triggered.⌋

[CP_SWS_ISO15118Chrg_00071] General Requirement

Status: DRAFT

⌈Upon reception of the message 'CurrentDemandRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is succesfully processed if the charging process is to be stopped, then the message 'PowerDeliveryReq' with the parameter ChargeProgress set to STOP shall be triggered.⌋

[CP_SWS_ISO15118Chrg_00072] General Requirement

Status: DRAFT

⌈Upon reception of the message 'PowerDeliveryRes' to the previous 'PowerDeliveryReq' with ChargeProgress set to STOP, the message 'WeldingDetectionReq' shal be triggered through the operation `WeldingDetectionParams` if welding detection is to be performed, else the message 'SessionStopReq' shall be triggered.⌋

[CP_SWS_ISO15118Chrg_00077] General Requirement

Status: DRAFT

⌈Upon reception of the message 'WeldingDetectionRes', the ISO15118Chrg shall proceed as per requirements mentioned [CP_SWS_ISO15118Chrg_00010], [CP_SWS_ISO15118Chrg_00011], [CP_SWS_ISO15118Chrg_00012], [CP_SWS_ISO15118Chrg_00013], [CP_SWS_ISO15118Chrg_00014]. If the message is successfully processed, then the message 'SessionStopReq' shall be triggered.⌋

[CP_SWS_ISO15118Chrg_00073] General Requirement

Status: DRAFT

⌈If the message 'SessionSetupReq' is triggered with parameter ChargingSession set to PAUSE, then ISO15118Chrg shall move to the state `V2G Session Paused`, stop the V2G session and terminate the transport layer, un-assign the IP, delete the SECC Port Number and IP address. The ISO15118Chrg shall be able to resume a 'PAUSED' session, by going to the state `Assigning IP Address` by calling 'SessionSetupReq', the following shall take place:

- Assign the IP address again
- Perform SDP again
- Establish TCP-TLS session again
- Establish V2G session again

The following need to be provided:

- SessionID which was communicated in the header of the SessionSetupRes message in the previous V2G Communication Session (for all request messages starting from SessionSetupReq).
- SelectedPaymentOption (PaymentServiceSelectionReq)
- RequestedEnergyTransferMode (ChargeParameterDiscoveryReq)
- DepartureTime in ChargeParameterDiscoveryReq reduced by the elapsed time
- Parameter EAmount in ChargeParameterDiscoveryReq reduced by the energy that was already charged

⌋

Note: An EVCC can resume a charging session by sending a SesstionSetupReq with a message header including the SessionID value from the previously paused V2G Communication Session. Note: The following requirements are for renegotiation during DC charging phase.

[CP_SWS_ISO15118Chrg_00074] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'CurrentDemandRes', the charge profile can be renegotiated by sending the request message 'PowerDeliveryReq' with parameter ChargeProgess set to Renegotiate.⌋

[CP_SWS_ISO15118Chrg_00075] General Requirement

Status: DRAFT

⌈After succesfully processing the response message 'MeteringReceiptRes', the charge profile can be renegotiated by sending the request message 'PowerDeliveryReq' with parameter ChargeProgess set to Renegotiate.⌋

[SWS_ISO15118Chrg_00092] DRAFT

Status: DRAFT

⌈ISO15118Chrg module shall retrieve TLS related information such as the TLS version by following the configuration references of `ISO15118ChrgSoAdSocketConnectionRef` and corresponding *SoAdSocketTcpTlsConnectionRef*.⌋

7.5 Error Classification

Chapter [13, General Specification of Basic Software Modules] 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, the following section specifies particular errors arranged in the respective subsections below.

7.5.1 Development Errors

[CP_SWS_ISO15118Chrg_00113] Definition of development errors in module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00337, SRS_BSW_00323, SRS_BSW_00350

⌈

Type of error	*Related error code*	*Error value*
API service called before initializing the module	ISO15118CHRG_E_UNINIT	0x01
API service called with NULL pointer	ISO15118CHRG_E_PARAM_POINTER	0x02
Invalid argument	ISO15118CHRG_E_INV_ARG	0x03
Invalid configuration set selection	ISO15118CHRG_E_INIT_FAILED	0x06

⌋

7.5.2 Runtime Errors

[CP_SWS_ISO15118Chrg_00114] Definition of runtime errors in module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00452

⌈

Type of error	*Related error code*	*Error value*
No buffer space available	ISO15118CHRG_E_NOBUFS	0x07

⌋

7.5.3 Production Errors

No production errors.

7.6 Security Events

The module does not report any security events.

8 API specification

Note: Chapters 8 and 9 are available at the following link:

8.1 Imported types

In this chapter all types included from the following files are listed.

[CP_SWS_ISO15118Chrg_00115] Definition of imported datatypes of module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00301

⌈

Module	*Header File*	*Imported Type*
BswM	BswM.h	BswM_ModeType
	BswM.h	BswM_UserType
Comtype	ComStack_Types.h	BufReq_ReturnType
	ComStack_Types.h	PduIdType
	ComStack_Types.h	PduInfoType
	ComStack_Types.h	PduLengthType
	ComStack_Types.h	RetryInfoType
	ComStack_Types.h	TpDataStateType
Csm	Rte_Csm_Type.h	Crypto_OperationModeType
	Rte_Csm_Type.h	Crypto_VerifyResultType
EthTrcv	Eth_GeneralTypes.h	EthTrcv_LinkStateType
KeyM	KeyM.h	KeyM_CertDataType
	Rte_KeyM_Type.h	KeyM_CertElementIdType
	Rte_KeyM_Type.h	KeyM_CertificateIdType
	Rte_KeyM_Type.h	KeyM_ServiceCertificateType
SoAd	SoAd.h	SoAd_SoConIdType
	SoAd.h	SoAd_SoConModeType
Std	Std_Types.h	Std_ReturnType
TcpIp	TcpIp.h	TcpIp_DomainType
	TcpIp.h	TcpIp_IpAddrAssignmentType
	TcpIp.h	TcpIp_IpAddrStateType
	TcpIp.h	TcpIp_LocalAddrIdType
	TcpIp.h	TcpIp_ReturnType
	TcpIp.h	TcpIp_SockAddrType

⌋

8.2 Type definitions

8.2.1 ISO15118Chrg_ConfigType

[CP_SWS_ISO15118Chrg_00116] Definition of datatype ISO15118Chrg_ConfigType

Status: DRAFT
Upstream requirements: SRS_BSW_00438, SRS_BSW_00305

⌈

Name	ISO15118Chrg_ConfigType (draft)
Kind	Structure
Description	This is the type of the data structure containing the initialization data for COM. **Tags:** atp.Status=draft
Available via	Rte_ISO15118Chrg.h

⌋

8.2.2 ISO15118Chrg_AC_EVChargeParameterType

[CP_SWS_ISO15118Chrg_00153] Definition of ImplementationDataType ISO15118Chrg_AC_EVChargeParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_AC_EVChargeParameterType (draft)	
Kind	Structure	
Elements	DepartureTime	
	Type	uint32
	Comment	This element is used to indicate when the vehicle intends to finish the charging process. Offset in seconds from the point in time of sending this message.
	EAmount	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Amount of energy reflecting the EV's estimate how much energy is needed to fulfill the user configured charging goal for the current charging session. This might include energy for other purposes than solely charging the HV battery of an EV.
	EVMaxVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	The RMS of the maximal nominal voltage the vehicle can accept, measured between one phase and neutral.
	EVMaxCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum current supported by the EV per phase.

▽

△

	EVMinCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	EVMinCurrent is used to indicate to the SECC that charging below this minimum is not energy/cost efficient for the EV. It is recommended that the SECC considers this value during the target setting process (e.g. sale tariff table should account for this value). However, if there is physical limitations or limitations indicated by the PWM signal these limitations overwrite the EVMinCurrent the EV indicated. It is implementation specific whether a vehicle chooses not to charge if the EVMinCurrent is higher than the physical limitations for efficiency reasons.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.3 ISO15118Chrg_AC_EVSEChargeParameterType

[CP_SWS_ISO15118Chrg_00154] Definition of ImplementationDataType ISO15118Chrg_AC_EVSEChargeParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_AC_EVSEChargeParameterType (draft)	
Kind	Structure	
Elements	AC_EVSEStatus	
	Type	ISO15118Chrg_AC_EVSEStatusType
	Comment	Current status of the EVSE
	EVSENominalVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Line voltage supported by the EVSE. This is the voltage measured between one phases and neutral. If the EVSE supports multiple phase charging the EV might easily calculate the voltage between phases. This parameter is also used as reference for calculating the corresponding maximum charging current out of the PMax values in the SASchedule entities.
	EVSEMaxCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum allowed line current restriction set by the EVSE per phase. If the PWM ratio is set to 5% ratio then this is the only line current restriction processed by the EVCC. Otherwise, the EVCC applies the smaller current constraint from the EVSEMaxCurrent value and the PWM ratio information.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	

▽

△

Available via	Rte_ISO15118Chrg.h

⌋

8.2.4 ISO15118Chrg_AC_EVSEStatusType

[CP_SWS_ISO15118Chrg_00155] Definition of ImplementationDataType ISO15118Chrg_AC_EVSEStatusType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_AC_EVSEStatusType (draft)	
Kind	Structure	
Elements	RCD	
	Type	boolean
	Comment	Indicates the current status of the Residual Current Device (RCD). If RCD is equal to true, the RCD has detected an error. If RCD is equal to false, the RCD has not detected an error. This status flag is for informational purpose only.
	NotificationMaxDelay	
	Type	uint16
	Comment	This value is the time in seconds from the point in time this message is sent (relative time) and expected to perform the action immediately. The SECC uses the NotificationMaxDelay element in the EVSEStatus to indicate the time until it expects the EVCC to react on the action request indicated in EVSENotification.
	EVSENotification	
	Type	ISO15118Chrg_EVSENotificationType
	Comment	This value is used by the SECC to influence the behavior of the EVCC. The EVSENotification contains an action that the SECC wants the EVCC to perform. The requested action is expected by the EVCC until the time provided in NotificationMaxDelay. If the target time is not in the future, the EVCC is expected to perform the action immediately. During normal operation the value of EVSENotification is set to “none”.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.5 ISO15118Chrg_AppProtocolType

[CP_SWS_ISO15118Chrg_00156] Definition of ImplementationDataType ISO15118Chrg_AppProtocolType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_AppProtocolType (draft)	
Kind	Structure	
Elements	ProtocolNameSpace	
	Type	ISO15118Chrg_ProtocolNameSpaceType
	Comment	This message element is used by the EVCC to uniquely identify the Namespace URI of a specific protocol supported by the EVCC, i.e. this is the protocol name of the related protocol.
	ProtocolNameSpaceLength	
	Type	uint8
	Comment	Defines the length of the ProtocolNameSpace argument.
	VersionNumberMajor	
	Type	uint16
	Comment	This message element is used by the EVCC to indicate the major version number of the protocol indicated in the message element ProtocolNamespace.
	VersionNumberMinor	
	Type	uint16
	Comment	This message element is used by the EVCC to indicate the minor version number of the protocol indicated in the message element ProtocolNamespace.
	SchemaID	
	Type	uint8
	Comment	This message element is used by the EVCC to indicate the SchemaID assigned by the EVCC to the protocol indicated in the message element ProtocolNamespace, VersionNumberMajor and Version NumberMinor.
	Priority	
	Type	uint8
	Comment	This message element is used by the EVCC for indicating the protocol priority of a specific protocol allowing the SECC to select a protocol based on priorities.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.6 ISO15118Chrg_AppProtocolType_ArrayType

[CP_SWS_ISO15118Chrg_00157] Definition of ImplementationDataType ISO15118Chrg_AppProtocolType_ArrayType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_AppProtocolType_ArrayType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_AppProtocolType
Size	20 Elements		
Description	An array of 20 elements as defined in ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.7 ISO15118Chrg_CertificateChainType

[CP_SWS_ISO15118Chrg_00158] Definition of ImplementationDataType ISO15118Chrg_CertificateChainType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_CertificateChainType (draft)	
Kind	Structure	
Elements	Id	
	Type	ISO15118Chrg_StringType
	Comment	This attribute is used for referencing the message element in the signature header when a signature needs to be applied. It is used in response messages only.
	Certificate	
	Type	uint16
	Comment	An x.509v3 Certificate (the “client” certificate). The certificate is DER encoded.
	SubCertificates	
	Type	ISO15118Chrg_SubCertificatesType
	Comment	The Chain with all Subcertificates to the Root-Certificate (not including root certificate)
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.8 ISO15118Chrg_ChargeProgressType

[CP_SWS_ISO15118Chrg_00159] Definition of ImplementationDataType ISO15118Chrg_ChargeProgressType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargeProgressType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_Start	0x00	–
	ISO15118_Stop	0x01	–
	ISO15118_Renegotiate	0x02	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.9 ISO15118Chrg_ChargeServiceType

[CP_SWS_ISO15118Chrg_00160] Definition of ImplementationDataType ISO15118Chrg_ChargeServiceType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargeServiceType (draft)	
Kind	Structure	
Elements	ServiceId	
	Type	uint16
	Comment	This element identifies a service which has been offered by the SECC in the ServiceDiscoveryRes message.
	ServiceName	
	Type	ISO15118Chrg_StringType
	Comment	Human readable service name
	ServiceCategory	
	Type	ISO15118Chrg_ServiceCategoryType
	Comment	Category of a service, corresponds to the defined services, derived from the base service
	ServiceScope	
	Type	ISO15118Chrg_ServiceScopeType
	Comment	Additional information about usage of that service

▽

△

	ServiceScopeLength	
	Type	uint8
	Comment	Defines length of element ServiceScope.
	FreeService	
	Type	boolean
	Comment	This element is used by the SECC to indicate if a service can be used by the EVCC free of charge or not. If FreeService is equal to true, the EV can use the offered service without payment. If FreeService is equal to false, the service, if used by the EV, will be billed using the payment method negotiated using the payment option message element.
	SupportedEnergyTransferMode	
	Type	ISO15118Chrg_SupportedEnergyTransferModeType
	Comment	Available energy transfer modes supported by the EVSE.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.10 ISO15118Chrg_ChargingProfileType

[CP_SWS_ISO15118Chrg_00161] Definition of ImplementationDataType ISO15118Chrg_ChargingProfileType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargingProfileType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_ProfileEntryType
Size	24 Elements		
Description	An array of 24 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.11 ISO15118Chrg_ChargingSequenceStateType

[CP_SWS_ISO15118Chrg_00162] Definition of ImplementationDataType ISO15118Chrg_ChargingSequenceStateType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargingSequenceStateType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_CS_INIT	0x00	–
	ISO15118_CS_Slac	0x01	–
	ISO15118_CS_AssigningIp Address	0x02	–
	ISO15118_CS_Discovering Secc	0x03	–
	ISO15118_CS_Establishing TcpTls	0x04	–
	ISO15118_CS_Supported AppProtocol	0x05	–
	ISO15118_CS_Session Setup	0x06	–
	ISO15118_CS_Service Discovery	0x07	–
	ISO15118_CS_Service Detail	0x08	–
	ISO15118_CS_Service PaymentSelection	0x09	–
	ISO15118_CS_Certificate Installation	0x0A	–
	ISO15118_CS_Certificate Update	0x0B	–
	ISO15118_CS_Payment Details	0x0C	–
	ISO15118_CS_ Authorization	0x0D	–
	ISO15118_CS_Charge ParameterDiscovery	0x0E	–
	ISO15118_CS_CableCheck	0x0F	–
	ISO15118_CS_PreCharge	0x1A	–
	ISO15118_CS_Power Delivery	0x1B	–
	ISO15118_CS_Current Demand	0x1C	–
	ISO15118_CS_Charging Status	0x1D	–
	ISO15118_CS_Metering Receipt	0x1E	–

▽

△

	ISO15118_CS_Welding Detection	0x1F	–
	ISO15118_CS_SessionStop	0x2A	–
Description	Charge states **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.12 ISO15118Chrg_ChargingSequenceSubStateType

[CP_SWS_ISO15118Chrg_00163] Definition of ImplementationDataType ISO15118Chrg_ChargingSequenceSubStateType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargingSequenceSubStateType (draft)		
Kind	Type		
Derived from	uint8		
Range	Implementation specific	0x00 to 0x7F	–
Description	Charge states. Literals have implementation specific values from 0x00 to 0x7F. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.13 ISO15118Chrg_ChargingSessionType

[CP_SWS_ISO15118Chrg_00164] Definition of ImplementationDataType ISO15118Chrg_ChargingSessionType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ChargingSessionType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_Terminate	0x00	–
	ISO15118_Pause	0x01	–

▽

△

Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft
Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.14 ISO15118Chrg_ConsumptionCostType

[CP_SWS_ISO15118Chrg_00165] Definition of ImplementationDataType ISO15118Chrg_ConsumptionCostType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ConsumptionCostType (draft)	
Kind	Structure	
Elements	Cost	
	Type	ISO15118Chrg_CostType
	Comment	Encapsulating element describing all relevant cost details for this consumption block in this Tariff Entry.
	startValue	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	The lowest level of consumption that defines the starting point of this consumption block. The block interval extends to the start of the next interval.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.15 ISO15118Chrg_CostKindType

[CP_SWS_ISO15118Chrg_00166] Definition of ImplementationDataType ISO15118Chrg_CostKindType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_CostKindType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_RelativePrice Percentage	0x00	–
	ISO15118_Renewable GenerationPercentage	0x01	–
	ISO15118_CarbonDioxide Emission	0x02	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.16 ISO15118Chrg_CostType

[CP_SWS_ISO15118Chrg_00167] Definition of ImplementationDataType ISO15118Chrg_CostType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_CostType (draft)	
Kind	Structure	
Elements	amount	
	Type	uint16
	Comment	The estimated or actual cost per kWh
	amountMultiplier	
	Type	ISO15118Chrg_UnitMultiplierType
	Comment	The amountMultiplier defines the exponent to base 10 (dec). The final value is determined by amount * 10 ^ amountMultiplier.
	costKind	
	Type	ISO15118Chrg_CostKindType
	Comment	The kind of cost referred to in the message element amount (refer to Table 82 for the semantics description of individual enumeration values defined for this type).

▽

△

Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft
Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.17 ISO15118Chrg_DC_EVChargeParameterType

[CP_SWS_ISO15118Chrg_00168] Definition of ImplementationDataType ISO15118Chrg_DC_EVChargeParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVChargeParameterType (draft)	
Kind	Structure	
Elements	DepartureTime	
	Type	uint32
	Comment	This element is used to indicate when the vehicle intends to finish the charging process. Offset in seconds from the point in time of sending this message.
	DC_EVStatus	
	Type	ISO15118Chrg_DC_EVStatusType
	Comment	Current status of the EV
	EVMaximumCurrentLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum current supported by the EV
	EVMaximumPowerLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum power supported by the EV
	EVMaximumVoltageLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum voltage supported by the EV
	EVEnergyCapacity	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Energy capacity of the EV
	EVEnergyRequest	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Amount of energy the EV requests from the EVSE.
	FullSOC	
	Type	uint8
	Comment	SOC at which the EV considers the battery to be fully charged

▽

△

	BulkSOC	
	Type	uint8
	Comment	SOC at which the EV considers a fast charge process to end.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.18 ISO15118Chrg_DC_EVErrorCodeType

[CP_SWS_ISO15118Chrg_00169] Definition of ImplementationDataType ISO15118Chrg_DC_EVErrorCodeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVErrorCodeType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_No_Error	0x00	–
	ISO15118_FAILED_ RESSTemperatureInhibit	0x01	–
	ISO15118_FAILED_EVShift Position	0x02	–
	ISO15118_FAILED_ ChargerConnectorLockFault	0x03	–
	ISO15118_FAILED_ EVRESSMalfunction	0x04	–
	ISO15118_FAILED_ ChargingCurrentdifferential	0x05	–
	ISO15118_FAILED_ ChargingVoltageOutOf Range	0x06	–
	ISO15118_Reserved_A	0x07	–
	ISO15118_Reserved_B	0x08	–
	ISO15118_Reserved_C	0x09	–
	ISO15118_FAILED_ ChargingSystem Incompatibility	0x10	–
	ISO15118_NoData	0x11	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.19 ISO15118Chrg_DC_EVPowerDeliveryParameterType

[CP_SWS_ISO15118Chrg_00170] Definition of ImplementationDataType ISO15118Chrg_DC_EVPowerDeliveryParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVPowerDeliveryParameterType (draft)	
Kind	Structure	
Elements	DC_EVStatus	
	Type	ISO15118Chrg_DC_EVStatusType
	Comment	Current status of the EV.
	BulkChargingComplete	
	Type	boolean
	Comment	If set to TRUE, the EV indicates that bulk charge (approx. 80% SOC) is complete.
	ChargingComplete	
	Type	boolean
	Comment	If set to TRUE, the EV indicates that full charge (100% SOC) is complete.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.20 ISO15118Chrg_DC_EVSEChargeParameterType

[CP_SWS_ISO15118Chrg_00171] Definition of ImplementationDataType ISO15118Chrg_DC_EVSEChargeParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVSEChargeParameterType (draft)	
Kind	Structure	
Elements	DC_EVSEStatus	
	Type	ISO15118Chrg_DC_EVSEStatusType
	Comment	Current status of the EVSE
	EVSEMaximumCurrentLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum current the EVSE can deliver
	EVSEMaximumPowerLimit	

▽

△

	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum power the EVSE can deliver
	EVSEMaximumVoltageLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum voltage the EVSE can deliver
	EVSEMinimumCurrentLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Minimum current the EVSE can deliver with the expected accuracy
	EVSEMinimumVoltageLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Minimum voltage the EVSE can deliver with the expected accuracy
	EVSECurrentRegulationTolerance	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Absolute magnitude of the regulation tolerance of the EVSA
	EVSEPeakCurrentRipple	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Peak-to-peak magnitude of the current ripple of the EVSE
	EVSEEnergyToBeDelivered	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Amount of energy to be delivered by the EVSE
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.21 ISO15118Chrg_DC_EVSEStatusCodeType

[CP_SWS_ISO15118Chrg_00172] Definition of ImplementationDataType ISO15118Chrg_DC_EVSEStatusCodeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVSEStatusCodeType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_EVSE_Not Ready	0x00	–
	ISO15118_EVSE_Ready	0x01	–
	ISO15118_EVSE_ Shutdown	0x02	–

▽

△

	ISO15118_EVSE_Utility InterruptEvent	0x03	–
	ISO15118_EVSE_Isolation MonitoringActive	0x04	–
	ISO15118_EVSE_ EmergencyShutdown	0x05	–
	ISO15118_EVSE_ Malfunction	0x06	–
	ISO15118_Reserved_8	0x07	–
	ISO15118_Reserved_9	0x08	–
	ISO15118_Reserved_A	0x09	–
	ISO15118_Reserved_B	0x10	–
	ISO15118_Reserved_C	0x11	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.22 ISO15118Chrg_DC_EVSEStatusType

[CP_SWS_ISO15118Chrg_00173] Definition of ImplementationDataType ISO15118Chrg_DC_EVSEStatusType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVSEStatusType (draft)	
Kind	Structure	
Elements	NotificationMaxDelay	
	Type	uint16
	Comment	This value is the time in seconds from the point in time this message is sent (relative time) and expected to perform the action immediately. The SECC uses the NotificationMaxDelay element in the EVSEStatus to indicate the time until it expects the EVCC to react on the action request indicated in EVSENotification.
	EVSENotification	
	Type	ISO15118Chrg_EVSENotificationType
	Comment	This value is used by the SECC to influence the behavior of the EVCC. The EVSENotification contains an action that the SECC wants the EVCC to perform. The requested action is expected by the EVCC until the time provided in NotificationMaxDelay. If the target time is not in the future, the EVCC is expected to perform the action immediately. During normal operation the value of EVSENotification is set to “none”.
	EVSEIsolationStatus	
	Type	ISO15118Chrg_IsolationLevelType

▽

△

	Comment	Indicates the isolation condition (result of the isolation monitoring). The parameter shall be handled according to IEC CDV 61851-23
	DC_EVSEStatusCode	
	Type	ISO15118Chrg_DC_EVSEStatusCodeType
	Comment	Indicates the internal state of the EVSE. Refer to ISO15118-2
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.23 ISO15118Chrg_DC_EVStatusType

[CP_SWS_ISO15118Chrg_00174] Definition of ImplementationDataType ISO15118Chrg_DC_EVStatusType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_DC_EVStatusType (draft)	
Kind	Structure	
Elements	EVReady	
	Type	boolean
	Comment	If set to TRUE, the EV is ready to charge.
	EVErrorCode	
	Type	ISO15118Chrg_DC_EVErrorCodeType
	Comment	Indicates the EV internal status.
	EVRESSSOC	
	Type	uint8
	Comment	State of charge of the EV's battery (RESS)
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.24 ISO15118Chrg_eMAIDType

[CP_SWS_ISO15118Chrg_00175] Definition of ImplementationDataType ISO15118Chrg_eMAIDType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_eMAIDType (draft)		
Kind	Array	***Element type***	uint8
Size	15 Elements		
Description	An array to support uint8 characters. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.25 ISO15118Chrg_EnergyTransferModeType

[CP_SWS_ISO15118Chrg_00176] Definition of ImplementationDataType ISO15118Chrg_EnergyTransferModeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_EnergyTransferModeType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_AC_single_phase_core	0x00	–
	ISO15118_AC_three_phase_core	0x01	–
	ISO15118_DC_core	0x02	–
	ISO15118_DC_Extended	0x03	–
	ISO15118_DC_Combo_core	0x04	–
	ISO15118_DC_Unique	0x05	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.26 ISO15118Chrg_EntryType

[CP_SWS_ISO15118Chrg_00177] Definition of ImplementationDataType ISO15118Chrg_EntryType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_EntryType (draft)	
Kind	Structure	
Elements	TimeInterval	
	Type	ISO15118Chrg_RelativeTimeIntervalType
	Comment	–
Description	A structure having element TimeInterval as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.27 ISO15118Chrg_EVSEIdType

[CP_SWS_ISO15118Chrg_00178] Definition of ImplementationDataType ISO15118Chrg_EVSEIdType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_EVSEIdType (draft)		
Kind	Array	***Element type***	uint8
Size	37 Elements		
Description	An array which can support maximum of 37 uint8 characters. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.28 ISO15118Chrg_EVSENotificationType

[CP_SWS_ISO15118Chrg_00179] Definition of ImplementationDataType ISO15118Chrg_EVSENotificationType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_EVSENotificationType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_None	0x00	–
	ISO15118_StopCharging	0x01	–
	ISO15118_Renegotiate	0x02	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.29 ISO15118Chrg_IsolationLevelTypeType

[CP_SWS_ISO15118Chrg_00180] Definition of ImplementationDataType ISO15118Chrg_IsolationLevelType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_IsolationLevelType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_Invalid	0x00	–
	ISO15118_Valid	0x01	–
	ISO15118_Warning	0x02	–
	ISO15118_Fault	0x03	–
	ISO15118_No_IMD	0x04	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.30 ISO15118Chrg_MeterInfoType

[CP_SWS_ISO15118Chrg_00181] Definition of ImplementationDataType ISO15118Chrg_MeterInfoType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_MeterInfoType (draft)	
Kind	Structure	
Elements	MeterID	
	Type	ISO15118Chrg_StringType
	Comment	ID of the meter in the EVSE
	MeterReading	
	Type	uint32
	Comment	Current meter reading in Watthours from the EVSE
	SigMeterReading	
	Type	uint32
	Comment	Signature of the meter reading This signature is generated by the EVSE meter. It is not verified at the EVCC. It might be used by a SA system for billing purposes if local regulations on metering permit it
	MeterStatus	
	Type	uint16
	Comment	Current status of the meter. The definition of the content of the Meter Status is out of scope of the standard. The content may be defined by the EVSE operator or utility.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.31 ISO15118Chrg_ParameterSetTypeType

[CP_SWS_ISO15118Chrg_00182] Definition of ImplementationDataType ISO15118Chrg_ParameterSetType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ParameterSetType (draft)	
Kind	Structure	
Elements	ParameterSetID	
	Type	uint16

▽

△

	Comment	This element is used to select a specific parameter set for a specific ServideID when selecting a service using the PaymentService SelectionReq message.
	Parameter	
	Type	ISO15118Chrg_ParameterType
	Comment	This element is used by the SECC to indicate which service specific parameters can be selected for a certain service using the Parameter SetID. The number of Parameter elements is limited to 16.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.32 ISO15118Chrg_ParameterSetType_ArrayType

[CP_SWS_ISO15118Chrg_00183] Definition of ImplementationDataType ISO15118Chrg_ParameterSetType_ArrayType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ParameterSetType_ArrayType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_ParameterSetType
Size	255 Elements		
Description	A structure having elements as defined in ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.33 ISO15118Chrg_ParameterType

[CP_SWS_ISO15118Chrg_00184] Definition of ImplementationDataType ISO15118Chrg_ParameterType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ParameterType (draft)	
Kind	Structure	
Elements	BooleanValue	
	Type	boolean
	Comment	This element is used to indicate the value for the parameter indicated by the element Name. A choice of 6 different element types. Only one for each parameter can be selected.
	ByteValue	
	Type	uint8
	Comment	–
	ShortValue	
	Type	uint16
	Comment	–
	IntValue	
	Type	uint32
	Comment	–
	PhysicalValue	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	–
	StringValue	
	Type	ISO15118Chrg_StringType
	Comment	–
Description	Pointer to an array of 255 elements as per ISO15118-2. **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.34 ISO15118Chrg_PaymentOptionListType

[CP_SWS_ISO15118Chrg_00185] Definition of ImplementationDataType ISO15118Chrg_PaymentOptionListType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PaymentOptionListType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_PaymentOptionType
Size	2 Elements		
Description	An array of 2 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.35 ISO15118Chrg_PaymentOptionType

[CP_SWS_ISO15118Chrg_00186] Definition of ImplementationDataType ISO15118Chrg_PaymentOptionType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PaymentOptionType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_Contract	0x00	–
	ISO15118_ExternalPayment	0x01	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.36 ISO15118Chrg_PhysicalValueType

[CP_SWS_ISO15118Chrg_00187] Definition of ImplementationDataType ISO15118Chrg_PhysicalValueType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PhysicalValueType (draft)	
Kind	Structure	
Elements	Multiplier	
	Type	ISO15118Chrg_UnitMultiplierType
	Comment	The Multiplier defines the exponent to base 10 (dec). The final physical value is determined by: Value * 10 ^ Multiplier [Unit]
	Unit	
	Type	ISO15118Chrg_UnitSymbolType
	Comment	Unit of the value.
	Value	
	Type	uint16
	Comment	Value which has to be multiplied
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.37 ISO15118Chrg_PmaxScheduleEntryType

[CP_SWS_ISO15118Chrg_00188] Definition of ImplementationDataType ISO15118Chrg_PmaxScheduleEntryType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PmaxScheduleEntryType (draft)	
Kind	Structure	
Elements	RelativeTimeInterval	
	Type	ISO15118Chrg_EntryType
	Comment	Extends the TimeIntervalType and defines the time interval the PMax ScheduleEntry is valid for based upon relative times.
	PMax	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Defines maximum amount of power for a time interval to be drawn from the EVSE power outlet the vehicle is connected to. This value represents the total power over all selected phases.

▽

△

Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft
Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.38 ISO15118Chrg_PMaxScheduleType_ArrayType

[CP_SWS_ISO15118Chrg_00189] Definition of ImplementationDataType ISO15118Chrg_PMaxScheduleType_ArrayType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PMaxScheduleType_ArrayType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_PmaxScheduleEntryType
Size	1024 Elements		
Description	An array of 1024 structure variables as per ISO15118-2 **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.39 ISO15118Chrg_PMaxScheduleTypePtr

[CP_SWS_ISO15118Chrg_00190] Definition of ImplementationDataType ISO15118Chrg_PMaxScheduleTypePtr

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_PMaxScheduleTypePtr (draft)
Kind	Pointer
Type	ISO15118Chrg_PMaxScheduleType_ArrayType*
Description	Pointer to an array of PMaxScheduleEntry elements. **Tags:** atp.Status=draft
Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.40 ISO15118Chrg_ProfileEntryType

[CP_SWS_ISO15118Chrg_00191] Definition of ImplementationDataType ISO15118Chrg_ProfileEntryType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ProfileEntryType (draft)	
Kind	Structure	
Elements	ChargingProfileEntryStart	
	Type	uint16
	Comment	Time when chargingProfileEntry starts to be valid. Offset in seconds from NOW
	ChargingProfileEntryMaxPower	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	Maximum power in Watt consumed by the EV within the current charging profile entry (beginning from ChargingProfileEntryStart)
	ChargingProfileEntryMaxNumberOfPhasesInUse	
	Type	ISO15118Chrg_PhysicalValueType
	Comment	This element is used by the EV to indicate the maximum number of phases it intends to use during the time interval defined by Charging ProfileEntryStart of this ProfileEntry.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.41 ISO15118Chrg_ProtocolNameSpaceType

[CP_SWS_ISO15118Chrg_00192] Definition of ImplementationDataType ISO15118Chrg_ProtocolNameSpaceType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ProtocolNameSpaceType (draft)		
Kind	Array	***Element type***	uint8
Size	100 Elements		
Description	An array to support maximum 100 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.42 ISO15118Chrg_RelativeTimeIntervalType

[CP_SWS_ISO15118Chrg_00193] Definition of ImplementationDataType ISO15118Chrg_RelativeTimeIntervalType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_RelativeTimeIntervalType (draft)	
Kind	Structure	
Elements	Duration	
	Type	uint32
	Comment	Duration of the interval, in seconds.
	Start	
	Type	uint32
	Comment	Start of the interval, in seconds from NOW.
Description	A structure having elements as per ISO15118-2. **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.43 ISO15118Chrg_ResponseCodeType

[CP_SWS_ISO15118Chrg_00194] Definition of ImplementationDataType ISO15118Chrg_ResponseCodeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ResponseCodeType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_Ok_NewSession Established	–	–
	ISO15118_OK_OldSession Joined	–	–
	ISO15118_OK_Certificate ExpiresSoon	–	–
	ISO15118_Successful NegotiationwithMinor Deviation	–	–
	ISO15118_FAILED	–	–
	ISO15118_FAILED_ SequenceError	–	–

▽

△

	ISO15118_FAILED_ServiceIDInvalid	–	–
	ISO15118_FAILED_UnknownSession	–	–
	ISO15118_FAILED_ServiceSelectionInvalid	–	–
	ISO15118_FAILED_PaymentSelectionInvalid	–	–
	ISO15118_FAILED_CertificateExpired	–	–
	ISO15118_FAILED_SignatureError	–	–
	ISO15118_FAILED_NoCertificateAvailable	–	–
	ISO15118_FAILED_CertChainError	–	–
	ISO15118_FAILED_ChallengeInvalid	–	–
	ISO15118_FAILED_ContractCanceled	–	–
	ISO15118_FAILED_WrongChargeParameter	–	–
	ISO15118_FAILED_PowerDeliveryNotApplied	–	–
	ISO15118_FAILED_TariffSelectionInvalid	–	–
	ISO15118_FAILED_ChargingProfileInvalid	–	–
	ISO15118_FAILED_MeteringSignatureNotValid	–	–
	ISO15118_FAILED_NoChargeServiceSelected	–	–
	ISO15118_FAILED_WrongEnergyTransferMode	–	–
	ISO15118_FAILED_ContactorError	–	–
	ISO15118_FAILED_CertificateNotAllowedAtThisEVSE	–	–
	ISO15118_FAILED_CertificateRevoked	–	–
	ISO15118_CommunicationSetupTimeout	–	–
	ISO15118_MsgTimeout	–	–
	ISO15118_CableCheckTimeout	–	–
	ISO15118_OngoingTimeout	–	–
	ISO15118_PrechargeTimeout	–	–
	ISO15118_Ok	0x01	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		

▽

△

Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.44 ISO15118Chrg_SalesTariffEntryType

[CP_SWS_ISO15118Chrg_00195] Definition of ImplementationDataType ISO15118Chrg_SalesTariffEntryType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SalesTariffEntryType (draft)	
Kind	Structure	
Elements	RelativeTimeInterval	
	Type	ISO15118Chrg_RelativeTimeIntervalType
	Comment	Extends the TimeIntervalType and defines the time interval the Sales TariffEntry is valid for based upon relative times.
	EPriceLevel	
	Type	uint16
	Comment	Defines the price level of this SalesTariffEntry (referring to NumEPrice Levels). Small values for the EPriceLevel represent a cheaper Tariff Entry. Large values for the EPriceLevel represent a more expensive TariffEntry.
	ConsumptionCost	
	Type	ISO15118Chrg_ConsumptionCostType
	Comment	Defines additional means for further relative price information and/or alternative costs.
Description	A structure having elements as per ISO15118-2. **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.45 ISO15118Chrg_SalesTariffEntryType_ArrayType

[CP_SWS_ISO15118Chrg_00196] Definition of ImplementationDataType ISO15118Chrg_SalesTariffEntryType_ArrayType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SalesTariffEntryType_ArrayType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_SalesTariffEntryType
Size	1024 Elements		
Description	An array as per ISO15118-2 **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.46 ISO15118Chrg_SalesTariffType

[CP_SWS_ISO15118Chrg_00197] Definition of ImplementationDataType ISO15118Chrg_SalesTariffType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SalesTariffType (draft)	
Kind	Structure	
Elements	Id	
	Type	ISO15118Chrg_StringType
	Comment	This attribute is used for referencing the message element in the signature header when a signature needs to be applied.
	SalesTariffID	
	Type	uint8
	Comment	SalesTariff identifier used to identify one sales tariff. A SAID remains a unique identifier for one schedule throughout a charging session.
	SalesTariffDescription	
	Type	ISO15118Chrg_TariffDescriptionType
	Comment	A human readable title/short description of the sales tariff e.g. for HMI display purposes.
	SalesTariffDescriptionLength	
	Type	uint8
	Comment	Defines length of the SalesTariffDescription argument.
	NumEPriceLevels	
	Type	uint16

▽

△

	Comment	Defines the overall number of distinct price levels used across all provided SalesTariff elements.
	SalesTariffEntry	
	Type	ISO15118Chrg_SalesTariffEntryType_ArrayType
	Comment	Encapsulating element describing all relevant details for one time interval of the SalesTariff. The number of SalesTariffEntry elements is limited by the parameter MaxEntriesSAScheduleTuple.
Description	A structure having elements as per ISO15118-2. **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.47 ISO15118Chrg_SAScheduleListType

[CP_SWS_ISO15118Chrg_00198] Definition of ImplementationDataType ISO15118Chrg_SAScheduleListType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SAScheduleListType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_SAScheduleTupleType
Size	3 Elements		
Description	An array of 3 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.48 ISO15118Chrg_SAScheduleTupleType

[CP_SWS_ISO15118Chrg_00199] Definition of ImplementationDataType ISO15118Chrg_SAScheduleTupleType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SAScheduleTupleType (draft)
Kind	Structure
Elements	SAScheduleTupleID

▽

△

	Type	uint8
	Comment	Unique identifier within a charging session for a SAScheduleTuple element An SAID remains a unique identifier for one schedule throughout a charging session.
	PMaxSchedule	
	Type	ISO15118Chrg_PMaxScheduleTypePtr
	Comment	Encapsulating element describing all relevant details for one PMax Schedule from the secondary actor.
	SalesTariff	
	Type	ISO15118Chrg_SalesTariffType
	Comment	Encapsulating element describing all relevant details for one Sales Tariff from the secondary actor
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.49 ISO15118Chrg_SelectedServiceListType

[CP_SWS_ISO15118Chrg_00214] Definition of ImplementationDataType ISO15118Chrg_SelectedServiceListType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SelectedServiceListType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_SelectedServiceType
Size	16 Elements		
Description	An array of 16 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.50 ISO15118Chrg_SelectedServiceType

[CP_SWS_ISO15118Chrg_00201] Definition of ImplementationDataType ISO15118Chrg_SelectedServiceType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SelectedServiceType (draft)	
Kind	Structure	
Elements	ServiceID	
	Type	uint16
	Comment	Unique identifier of the service
	ParameterSetID	
	Type	uint16
	Comment	This element is used to select a specific parameter set for a specific ServideID when selection a service using the PaymentService SelectionReq message.
Description	A structure having elements as per ISO15118-2 **Tags:** atp.Status=draft	
Variation	–	
Available via	Rte_ISO15118Chrg.h	

⌋

8.2.51 ISO15118Chrg_ServiceCategoryType

[CP_SWS_ISO15118Chrg_00202] Definition of ImplementationDataType ISO15118Chrg_ServiceCategoryType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ServiceCategoryType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_EVCharging	0x00	–
	ISO15118_Internet	0x01	–
	ISO15118_Contract Certificate	0x02	–
	ISO15118_OtherCustom	0x03	–
Description	An enumeration having values as per ISO15118-2. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.52 ISO15118Chrg_ServiceListType

[CP_SWS_ISO15118Chrg_00203] Definition of ImplementationDataType ISO15118Chrg_ServiceListType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ServiceListType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_ChargeServiceType
Size	8 Elements		
Description	An array of 8 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.53 ISO15118Chrg_ServiceParameterListTypePtr

[CP_SWS_ISO15118Chrg_00204] Definition of ImplementationDataType ISO15118Chrg_ServiceParameterListTypePtr

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ServiceParameterListTypePtr (draft)
Kind	Pointer
Type	ISO15118Chrg_ParameterSetType_ArrayType*
Description	Pointer to an array of 255 elements as per ISO15118-2. **Tags:** atp.Status=draft
Variation	–
Available via	Rte_ISO15118Chrg.h

⌋

8.2.54 ISO15118Chrg_ServiceScopeType

[CP_SWS_ISO15118Chrg_00205] Definition of ImplementationDataType ISO15118Chrg_ServiceScopeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_ServiceScopeType (draft)		
Kind	Array	***Element type***	uint8
Size	32 Elements		
Description	An array which can support maximum of 32 uint8 characters. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.55 ISO15118Chrg_StateMachineControlType

[CP_SWS_ISO15118Chrg_00206] Definition of ImplementationDataType ISO15118Chrg_StateMachineControlType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_StateMachineControlType (draft)		
Kind	Type		
Derived from	uint8		
Range	ISO15118_START	0x00	–
	ISO15118_RENEGOTIATE	0x01	–
	ISO15118_NORMAL_STOP	0x02	–
	ISO15118_EMERGENCY_STOP	0x03	–
Description	Machine control commands **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.56 ISO15118Chrg_StringType

[CP_SWS_ISO15118Chrg_00207] Definition of ImplementationDataType ISO15118Chrg_StringType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_StringType (draft)		
Kind	Array	***Element type***	uint8
Size	64 Elements		
Description	An array of uint8 of which supports maximum of 64 characters. Note: Use NULL character as the ending. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.57 ISO15118Chrg_SubCertificatesType

[CP_SWS_ISO15118Chrg_00208] Definition of ImplementationDataType ISO15118Chrg_SubCertificatesType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SubCertificatesType (draft)		
Kind	Array	***Element type***	uint16
Size	4 Elements		
Description	An array of 4 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.58 ISO15118Chrg_SupportedEnergyTransferModeType

[CP_SWS_ISO15118Chrg_00209] Definition of ImplementationDataType ISO15118Chrg_SupportedEnergyTransferModeType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_SupportedEnergyTransferModeType (draft)		
Kind	Array	***Element type***	ISO15118Chrg_EnergyTransferModeType
Size	6 Elements		
Description	An array of 6 elements. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.59 ISO15118Chrg_TariffDescriptionType

[CP_SWS_ISO15118Chrg_00210] Definition of ImplementationDataType ISO15118Chrg_TariffDescriptionType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_TariffDescriptionType (draft)		
Kind	Array	***Element type***	uint8
Size	32 Elements		
Description	An array which can support maximum of 32 uint8 characters. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.60 ISO15118Chrg_UnitMultiplierType

[CP_SWS_ISO15118Chrg_00211] Definition of ImplementationDataType ISO15118Chrg_UnitMultiplierType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_UnitMultiplierType (draft)		
Kind	Type		
Derived from	sint8		
Range	-3..+3	–	–
Description	The Multiplier defines the exponent to base 10 (dec). The final physical value is determined by: Value * 10 ^ Multiplier [Unit]. **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.2.61 ISO15118Chrg_UnitSymbolType

[CP_SWS_ISO15118Chrg_00212] Definition of ImplementationDataType ISO15118Chrg_UnitSymbolType

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ISO15118Chrg_UnitSymbolType (draft)		
Kind	Type		
Derived from	uint8		
Range	h	0x00	time in hours
	m	0x01	time in minutes
	s	0x02	time in seconds
	A	0x03	current in ampere
	V	0x04	voltage in volt
	W	0x05	power in watts
	Wh	0x06	energy in watthours
Description	– **Tags:** atp.Status=draft		
Variation	–		
Available via	Rte_ISO15118Chrg.h		

⌋

8.3 Function definitions

This chapter contains all APIs provided by the module.

8.3.1 ISO15118Chrg_Init

[CP_SWS_ISO15118Chrg_00119] Definition of API function ISO15118Chrg_Init

Status: DRAFT
Upstream requirements: SRS_BSW_00310, SRS_BSW_00101, SRS_BSW_00358, SRS_BSW_00414

⌈

Service Name	ISO15118Chrg_Init (draft)	
Syntax	`void ISO15118Chrg_Init ( const ISO15118Chrg_ConfigType* ConfigPtr )`	
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	This service initializes the ISO15118Chrg module **Tags:** atp.Status=draft	
Available via	ISO15118Chrg.h	

⌋

8.3.2 ISO15118Chrg_DataLinkIndication

[CP_SWS_ISO15118Chrg_00122] Definition of API function ISO15118Chrg_DataLinkIndication

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_DataLinkIndication (draft)
Syntax	`void ISO15118Chrg_DataLinkIndication ( uint8 CtrlIdx, EthTrcv_LinkStateType TransceiverLinkState )`
Service ID [hex]	0x02
Sync/Async	Synchronous
Reentrancy	Non Reentrant

▽

△

Parameters (in)	CtrlIdx	Index of the Ethernet controller within the context of the Ethernet Interface
	TransceiverLinkState	Actual transceiver link state of the specific network handle
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This API is called by the EthSM to inform the ISO15118Chrg module about the state of the data link connection. **Tags:** atp.Status=draft	
Available via	ISO15118Chrg.h	

⌋

8.3.3 ISO15118Chrg_V2GTpCopyRxData

[CP_SWS_ISO15118Chrg_00131] Definition of callback function ISO15118Chrg_V2GTpCopyRxData

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpCopyRxData (draft)	
Syntax	`BufReq_ReturnType ISO15118Chrg_V2GTpCopyRxData ( PduIdType id, const PduInfoType* info, PduLengthType* bufferSizePtr )`	
Service ID [hex]	0x44	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the received I-PDU.
	info	Provides the source buffer (SduDataPtr) and the number of bytes to be copied (SduLength). An SduLength of 0 can be used to query the current amount of available buffer in the upper layer module. In this case, the SduDataPtr may be a NULL_PTR.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer after data has been copied.
Return value	BufReq_ReturnType	`BUFREQ_OK`: Data copied successfully `BUFREQ_E_NOT_OK`: Data was not copied because an error occurred.
Description	This function is called to provide the received data of an I-PDU segment (N-PDU) to the upper layer. Each call to this function provides the next part of the I-PDU data. The size of the remaining buffer is written to the position indicated by bufferSizePtr. **Tags:** atp.Status=draft	
Available via	ISO15118Chrg.h	

⌋

8.3.4 ISO15118Chrg_V2GTpCopyTxData

[CP_SWS_ISO15118Chrg_00125] Definition of callback function ISO15118Chrg_V2GTpCopyTxData

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpCopyTxData (draft)	
Syntax	`BufReq_ReturnType ISO15118Chrg_V2GTpCopyTxData ( PduIdType id, const PduInfoType* info, const RetryInfoType* retry, PduLengthType* availableDataPtr )`	
Service ID [hex]	0x43	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the transmitted I-PDU.
	info	Provides the destination buffer (SduDataPtr) and the number of bytes to be copied (SduLength). If not enough transmit data is available, no data is copied by the upper layer module and BUFREQ_E_BUSY is returned. The lower layer module may retry the call. An SduLength of 0 can be used to indicate state changes in the retry parameter or to query the current amount of available data in the upper layer module. In this case, the Sdu DataPtr may be a NULL_PTR.
	retry	This parameter is used to acknowledge transmitted data or to retransmit data after transmission problems. If the retry parameter is a NULL_PTR, it indicates that the transmit data can be removed from the buffer immediately after it has been copied. Otherwise, the retry parameter must point to a valid RetryInfoType element. If TpDataState indicates TP_CONFPENDING, the previously copied data must remain in the TP buffer to be available for error recovery. TP_DATACONF indicates that all data that has been copied before this call is confirmed and can be removed from the TP buffer. Data copied by this API call is excluded and will be confirmed later. TP_DATARETRY indicates that this API call shall copy previously copied data in order to recover from an error. In this case TxTpDataCnt specifies the offset in bytes from the current data copy position.
Parameters (inout)	None	
Parameters (out)	availableDataPtr	Indicates the remaining number of bytes that are available in the upper layer module's Tx buffer. availableDataPtr can be used by TP modules that support dynamic payload lengths (e.g. FrIsoTp) to determine the size of the following CFs.
Return value	BufReq_ReturnType	`BUFREQ_OK`: Data has been copied to the transmit buffer completely as requested. `BUFREQ_E_BUSY`: Request could not be fulfilled, because the required amount of Tx data is not available. The lower layer module may retry this call later on. No data has been copied. `BUFREQ_E_NOT_OK`: Data has not been copied. Request failed.

▽

△

Description	This function is called to acquire the transmit data of an I-PDU segment (N-PDU). Each call to this function provides the next part of the I-PDU data unless retry->TpDataState is TP_DATARETRY. In this case the function restarts to copy the data beginning at the offset from the current position indicated by retry->TxTpDataCnt. The size of the remaining data is written to the position indicated by availableDataPtr. **Tags:** atp.Status=draft
Available via	ISO15118Chrg.h

⌋

8.3.5 ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg

[CP_SWS_ISO15118Chrg_00140] Definition of callback function ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg (draft)	
Syntax	`void ISO15118Chrg_V2GTpLocalIpAddrAssignmentChg ( TcpIp_LocalAddrIdType IpAddrId, TcpIp_IpAddrStateType State )`	
Service ID [hex]	0x18	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	IpAddrId	IP address Identifier, representing an IP address specified in the TcpIp module configuraiton (e.g. static IPv4 address on EthIf controller 0).
	State	state of IP address assignment
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The SoAd calls this API to inform the ISO15118Chrg module about the status of the IP address. **Tags:** atp.Status=draft	
Available via	ISO15118Chrg_SoAd.h	

⌋

8.3.6 ISO15118Chrg_V2GTpRxIndication

[CP_SWS_ISO15118Chrg_00133] Definition of callback function ISO15118Chrg_V2GTpRxIndication

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpRxIndication (draft)	
Syntax	`void ISO15118Chrg_V2GTpRxIndication ( PduIdType id, Std_ReturnType result )`	
Service ID [hex]	0x45	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the received I-PDU.
	result	`E_OK`: The PDU was received successfully. `E_NOT_OK`: Reception of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Called by the lower layer after an I-PDU has been received or after the final I-PDU has been received in case of segmentation. **Tags:** atp.Status=draft	
Available via	ISO15118Chrg.h	

⌋

8.3.7 ISO15118Chrg_V2GTpSoConModeChg

[CP_SWS_ISO15118Chrg_00141] Definition of callback function ISO15118Chrg_V2GTpSoConModeChg

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpSoConModeChg (draft)	
Syntax	`void ISO15118Chrg_V2GTpSoConModeChg ( SoAd_SoConIdType SoConId, SoAd_SoConModeType Mode )`	
Service ID [hex]	0x21	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different SoConIds. Non reentrant for the same SoConId.	
Parameters (in)	SoConId	Socket connection index specifying the socket connection with the mode change.
	Mode	New socket connection mode.

▽

△

Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	The SoAd calls this API to inform the ISO15118Chrg module about the status of the socket connection. Note: The parameter SoAdSocketSoConModeChgNotifUpperLayerRef of SoAd SocketConnectionGroup in container SoAdSocketConnectionGroup (see [ECUC_SoAd_00161]) of the [4] shall be configured. **Tags:** atp.Status=draft
Available via	ISO15118Chrg_SoAd.h

⌋

8.3.8 ISO15118Chrg_V2GTpStartOfReception

[CP_SWS_ISO15118Chrg_00128] Definition of callback function ISO15118Chrg_V2GTpStartOfReception

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpStartOfReception (draft)	
Syntax	`BufReq_ReturnType ISO15118Chrg_V2GTpStartOfReception ( PduIdType id, const PduInfoType* info, PduLengthType TpSduLength, PduLengthType* bufferSizePtr )`	
Service ID [hex]	0x46	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the I-PDU.
	info	Pointer to a PduInfoType structure containing the payload data (without protocol information) and payload length of the first frame or single frame of a transport protocol I-PDU reception, and the MetaData related to this PDU. If neither first/single frame data nor MetaData are available, this parameter is set to NULL_PTR.
	TpSduLength	Total length of the N-SDU to be received.
Parameters (inout)	None	
Parameters (out)	bufferSizePtr	Available receive buffer in the receiving module. This parameter will be used to compute the Block Size (BS) in the transport protocol module.
Return value	BufReq_ReturnType	`BUFREQ_OK`: Connection has been accepted. bufferSizePtr indicates the available receive buffer; reception is continued. If no buffer of the requested size is available, a receive buffer size of 0 shall be indicated by bufferSizePtr. `BUFREQ_E_NOT_OK`: Connection has been rejected; reception is aborted. bufferSizePtr remains unchanged. `BUFREQ_E_OVFL`: No buffer of the required length can be provided; reception is aborted. bufferSizePtr remains unchanged.

▽

△

Description	This function is called at the start of receiving an N-SDU. The N-SDU might be fragmented into multiple N-PDUs (FF with one or more following CFs) or might consist of a single N-PDU (SF). The service shall provide the currently available maximum buffer size when invoked with TpSdu Length equal to 0. **Tags:** atp.Status=draft
Available via	ISO15118Chrg.h

⌋

8.3.9 ISO15118Chrg_V2GTpTxConfirmation

[CP_SWS_ISO15118Chrg_00143] Definition of callback function ISO15118Chrg_V2GTpTxConfirmation

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_V2GTpTxConfirmation (draft)	
Syntax	`void ISO15118Chrg_V2GTpTxConfirmation ( PduIdType id, Std_ReturnType result )`	
Service ID [hex]	0x48	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	id	Identification of the transmitted I-PDU.
	result	`E_OK`: The PDU was transmitted successfully. `E_NOT_OK`: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The lower layer calls this API of the ISO15118Chrg module to inform the ISO15118Chrg module about the status of the transmitted PDU. **Tags:** atp.Status=draft	
Available via	ISO15118Chrg.h	

⌋

8.4 Scheduled functions

These functions are directly called by Basic Software Scheduler. The following functions shall have no return value and no parameter. All functions shall be non reentrant.

8.4.1 ISO15118Chrg_MainFunction_Rx

[CP_SWS_ISO15118Chrg_00146] Definition of scheduled function ISO15118 Chrg_MainFunction_Rx

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_MainFunction_Rx (draft)
Syntax	`void ISO15118Chrg_MainFunction_Rx ( void )`
Service ID [hex]	0x24
Description	This function performs the processing of the AUTOSAR ISO15118Chrg module's receive processing. **Tags:** atp.Status=draft
Available via	ISO15118Chrg_SchM.h

⌋

8.4.2 ISO15118Chrg_MainFunction_Tx

[CP_SWS_ISO15118Chrg_00145] Definition of scheduled function ISO15118 Chrg_MainFunction_Tx

Status: DRAFT
Upstream requirements: SRS_BSW_00310

⌈

Service Name	ISO15118Chrg_MainFunction_Tx (draft)
Syntax	`void ISO15118Chrg_MainFunction_Tx ( void )`
Service ID [hex]	0x23
Description	This function performs the processing of the AUTOSAR ISO15118Chrg module's transmit processing. **Tags:** atp.Status=draft
Available via	ISO15118Chrg_SchM.h

⌋

8.5 Expected interfaces

8.5.1 Mandatory Interfaces

[CP_SWS_ISO15118Chrg_00147] Definition of mandatory interfaces required by module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00384

⌈

API Function	*Header File*	*Description*
BswM_RequestMode	BswM.h	Generic function call to request modes. This function shall only be used by other BSW modules that does not have a specific mode request interface.
Csm_Decrypt	Csm.h	Decrypts the given encrypted data and store the decrypted plaintext in the memory location pointed by the result pointer.
Csm_Encrypt	Csm.h	Encrypts the given data and store the ciphertext in the memory location pointed by the result pointer.
Csm_KeyDerive	Csm.h	Derives a new key by using the key elements in the given key identified by the keyId. The given key contains the key elements for the password and salt. The derived key is stored in the key element with the id 1 of the key identified by targetCryptoKeyId.
Csm_KeyElementSet	Csm.h	Sets the given key element bytes to the key identified by keyId.
Csm_KeyExchangeCalcPubVal	Csm.h	Calculates the public value of the current user for the key exchange and stores the public key in the memory location pointed by the public value pointer.
Csm_KeyExchangeCalcSecret	Csm.h	Calculates the shared secret key for the key exchange with the key material of the key identified by the keyId and the partner public key. The shared secret key is stored as a key element in the same key.
Csm_RandomGenerate	Csm.h	Generate a random number and stores it in the memory location pointed by the result pointer.
Csm_SignatureGenerate	Csm.h	Uses the given data to perform the signature calculation and stores the signature in the memory location pointed by the result pointer.
Csm_SignatureVerify	Csm.h	Verifies the given signature by checking if it was generated with the given data.
Det_ReportRuntimeError	Det.h	Service to report runtime errors. If a callout has been configured then this callout shall be called.
KeyM_CertElementGet	KeyM.h	Provides the content of a specific certificate element. The certificate configuration defines how the certificate submodule can find the element, e.g. by providing the object identifier (OID). This function is used to retrieve this information if only one element is assigned to the respective OID.
KeyM_GetCertificate	KeyM.h	This function provides the DER encoded certificate data

▽

△

API Function	Header File	Description
KeyM_ServiceCertificate	KeyM.h	The key server requests an operation from the key client. The type of operation is specified in the first parameter KeyM_ServiceCertificateType. Certificate operation requests are operated through this function. This function is only available if the configuration parameter KeyMServiceCertificate FunctionEnabled is set to TRUE.
KeyM_SetCertificate	KeyM.h	This function provides the certificate data to the key management module to temporarily store the certificate.
KeyM_Update	KeyM.h	This function is used to initiate the key generation or update process.
KeyM_VerifyCertificate	KeyM.h	This function verifies a certificate that was previously provided with KeyM_SetCertificate() against already stored and provided certificates stored with other certificate IDs.
PduR_ISO15118ChrgTransmit	PduR_ISO15118Chrg.h	Requests transmission of a PDU.
SoAd_CloseSoCon	SoAd.h	This service closes the socket connection specified by SoConId.
SoAd_IfTransmit	SoAd.h	Requests transmission of a PDU.
SoAd_IsConnectionReady	SoAd.h	API allows to check if a communication over this socket connection is possible for a dedicated remote address. It includes that the socket connection is bound to a socket, a physical address is available for the requested remote address and if a security association is configured that a secured connection is already established.
SoAd_OpenSoCon	SoAd.h	This service opens the socket connection specified by SoConId.
SoAd_RequestIpAddrAssignment	SoAd.h	By this API service the local IP address assignment which shall be used for the socket connection specified by SoConId is initiated.

⌋

8.5.2 Optional Interfaces

[CP_SWS_ISO15118Chrg_00148] Definition of optional interfaces requested by module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00384

⌈

API Function	Header File	Description
Det_ReportError	Det.h	Service to report development errors.

⌋

8.5.3 Callout Interfaces

No callout interfaces.

8.5.4 Configurable Interfaces

Not applicable.

8.6 Service Interfaces

This section provides the necessary service interfaces.

8.6.1 Charge Parameters

[CP_SWS_ISO15118Chrg_00150] Definition of ClientServerInterface ChargeParameters

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ChargeParameters (draft)		
Comment	ISO15118 module uses this interface to request data from the ASW. **Tags:** atp.Status=draft		
IsService	true		
Variation	–		
Possible Errors	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	2	ISO15118CHRG_ SLACSTATEAVAILABLE	Slac state available
	3	ISO15118CHRG_SLAC-STATENOTAVAILABLE	Slac state not available
	4	ISO15118CHRG_ CONNECTIONDETAIL-SAVAILABLE	Connection details available
	5	ISO15118CHRG_ CONNECTIONDETAIL-SNOTAVAILABLE	Connection details not available
	6	ISO15118CHRG_STAT-EDETAILSAVAILABLE	State details available
	7	ISO15118CHRG_ STATEDETAILSNO-TAVAILABLE	State details not available

Operation	AuthorizationParams	
Comment	Get Id.	
Relates to	–	
Variation	–	
Parameters	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2

▽

△

	Variation	–
	Id	
	Type	ISO15118Chrg_StringType
	Direction	OUT
	Comment	Id as per ISO15118-2. String will be implemented as an array of uint8's.
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	CableCheckParams	
Comment	Get parameters for cable check.	
Relates to	–	
Variation	–	
Parameters	DC_EVStatus	
	Type	ISO15118Chrg_DC_EVStatusType
	Direction	IN
	Comment	DC_EVStatus as per ISO15118-2
	Variation	–
	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	ResponseCode as per ISO15118-2
	Variation	–
	DC_EVSEStatus	
	Type	ISO15118Chrg_DC_EVSEStatusType
	Direction	IN
	Comment	DC_EVSEStatus as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	ChargeParameterDiscoveryParams	
Comment	Get charge discovery parameters.	
Relates to	–	
Variation	–	
Parameters	AC_EVChargeParameter	
	Type	ISO15118Chrg_AC_EVChargeParameterType
	Direction	IN
	Comment	AC_EVChargeParameter as per ISO15118-2
	Variation	–
	DC_EVChargeParameter	
	Type	ISO15118Chrg_DC_EVChargeParameterType
	Direction	IN
	Comment	DC_EVChargeParameter as per ISO15118-2.
	Variation	–
	ResponseCodeType	

▽

△

	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	SAScheduleList	
	Type	ISO15118Chrg_SAScheduleListType
	Direction	IN
	Comment	SAScheduleList as per ISO15118-2
	Variation	–
	AC_EVSEChargeParameter	
	Type	ISO15118Chrg_AC_EVSEChargeParameterType
	Direction	IN
	Comment	AC_EVSEChargeParameter as per ISO15118-2
	Variation	–
	DC_EVSEChargeParameter	
	Type	ISO15118Chrg_DC_EVSEChargeParameterType
	Direction	IN
	Comment	DC_EVSEChargeParameter as per ISO15118-2
	Variation	–
	MaxEntriesSAScheduleTuple	
	Type	uint16
	Direction	OUT
	Comment	MaxEntriesSAScheduleTuple as per ISO15118.
	Variation	–
	RequestedEnergyTransferMode	
	Type	ISO15118Chrg_EnergyTransferModeType
	Direction	OUT
	Comment	RequestedEnergyTransferMode as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	ChargingStatusParams	
Comment	Send response code, SAScheduleTupleID, AC_EVSEStatusPtr.	
Relates to	–	
Variation	–	
Parameters	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	SAScheduleTupleID	
	Type	uint8
	Direction	IN
	Comment	SAScheduleTupleID as per ISO15118-2
	Variation	–

▽

△

	EVSEMaxCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEMaxCurrent as per ISO15118-2
	Variation	–
	AC_EVSEStatus	
	Type	ISO15118Chrg_AC_EVSEStatusType
	Direction	IN
	Comment	AC_EVSEStatus as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	CurrentDemandParams	
Comment	Get Current demand request parameters.	
Relates to	–	
Variation	–	
Parameters	DC_EVStatus	
	Type	ISO15118Chrg_DC_EVStatusType
	Direction	IN
	Comment	DC_EVStatus as per ISO15118-2
	Variation	–
	EVTargetCurrentPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVTargetCurrent as per ISO15118-2
	Variation	–
	EVMaximumVoltageLimitPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVMaximumVoltageLimit as per ISO15118-2
	Variation	–
	EVMaximumCurrentLimitPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVMaximumPowerLimit as per ISO15118-2
	Variation	–
	EVMaximumPowerLimitPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVMaximumPowerLimit as per ISO15118-2
	Variation	–
	RemainingTimeToFullSoCPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN

▽

△

	Comment	The ASW provides the parameter RemainingTimeToFullSoC to the ISO15118.
	Variation	–
	RemainingTimeToBulkSoCPtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	RemainingTimeToBulkSoC as per ISO15118-2
	Variation	–
	EVTargetVoltagePtr	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVTargetVoltage as per Iso15118-2.
	Variation	–
	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response Code as per ISO15118-2.
	Variation	–
	DC_EVSEStatus	
	Type	ISO15118Chrg_DC_EVSEStatusType
	Direction	IN
	Comment	ISO15118 provides the DC_EVSEStatus to ASW.
	Variation	–
	EVSEPresentVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentVoltage as per ISO15118-2.
	Variation	–
	EVSEPresentCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentCurrent as per ISO15118-2
	Variation	–
	EVSECurrentLimitAchieved	
	Type	boolean
	Direction	IN
	Comment	EVSECurrentLimitAchieved as per ISO15118-2
	Variation	–
	EVSEVoltageLimitAchieved	
	Type	boolean
	Direction	IN
	Comment	EVSEVoltageLimitAchieved as per ISO15118-2
	Variation	–
	EVSEPowerLimitAchieved	
	Type	boolean

▽

△

	Direction	IN
	Comment	EVSEPowerLimitAchieved as per ISO15118-2
	Variation	–
	EVSEMaximumPowerLimit	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEMaximumPowerLimit as per ISO15118-2
	Variation	–
	EVSEID	
	Type	ISO15118Chrg_EVSEIdType
	Direction	IN
	Comment	EVSEID as per ISO15118-2
	Variation	–
	EVSEID_Length	
	Type	uint8
	Direction	IN
	Comment	Defines length of EVSEID argument.
	Variation	–
	SAScheduleTupleID	
	Type	uint8
	Direction	IN
	Comment	SAScheduleTupleID as per ISO15118-2
	Variation	–
	MeterInfo	
	Type	ISO15118Chrg_MeterInfoType
	Direction	IN
	Comment	MeterInfo as per ISO15118-2
	Variation	–
	BulkChargingComplete	
	Type	boolean
	Direction	OUT
	Comment	BulkCharging as per ISO15118-2.
	Variation	–
	ChargingComplete	
	Type	boolean
	Direction	OUT
	Comment	ChargingComplete as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	ErrorNotification
Comment	Error notification to the upper layer.
Relates to	–
Variation	–
Parameters	ResponseCode

▽

△

	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
Possible Errors	–	

Operation	PaymentDetailsParams	
Comment	Get eMAID and ContractSignatureCertificateChain.	
Relates to	–	
Variation	–	
Parameters	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	EVSETimeStamp	
	Type	uint32
	Direction	IN
	Comment	ISO15118 provides the EVSETimeStamp to ASW
	Variation	–
	eMAID	
	Type	ISO15118Chrg_eMAIDType
	Direction	OUT
	Comment	eMAID as per ISO15118-2.
	Variation	–
	eMAID_Length	
	Type	uint8
	Direction	OUT
	Comment	Define length of eMAID.
	Variation	–
	ContractSignatureCertChain	
	Type	ISO15118Chrg_CertificateChainType
	Direction	OUT
	Comment	ContractSignatureCertificateChain as per ISO15118-2.
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	PaymentServiceSelectionParams	
Comment	Get PaymentOption and ServiceList.	
Relates to	–	
Variation	–	
Parameters	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2

▽

△

	Variation	–
	SelectedPaymentOption	
	Type	ISO15118Chrg_PaymentOptionType
	Direction	OUT
	Comment	PaymentOption as per ISO15118-2
	Variation	–
	SelectedServiceList	
	Type	ISO15118Chrg_SelectedServiceListType
	Direction	OUT
	Comment	ServiceList as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	PowerDeliveryParams	
Comment	Get ChargeProgress, SAScheduleTupleId, ChargingProfile, DC_EVPowerDeliveryParameter.	
Relates to	–	
Variation	–	
Parameters	DC_EVPowerDeliveryParameter	
	Type	ISO15118Chrg_DC_EVPowerDeliveryParameterType
	Direction	IN
	Comment	DC_EVPowerDeliveryParameter as per ISO15118-2.
	Variation	–
	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	ResponseCode as per ISO15118-2
	Variation	–
	AC_EVSEStatus	
	Type	ISO15118Chrg_AC_EVSEStatusType
	Direction	IN
	Comment	ISO15118 provides the AC_EVSEStatus to the ASW.
	Variation	–
	DC_EVSEStatus	
	Type	ISO15118Chrg_DC_EVSEStatusType
	Direction	IN
	Comment	ISO15118 provides the DC_EVSEStatus to the ASW.
	Variation	–
	ChargeProgress	
	Type	ISO15118Chrg_ChargeProgressType
	Direction	OUT
	Comment	ChargeProgress as per ISO15118-2.
	Variation	–
	SAScheduleTupleID	
	Type	uint8

▽

△

	Direction	OUT
	Comment	SAScheduleTupleId as per ISO15118-2.
	Variation	–
	ChargingProfile	
	Type	ISO15118Chrg_ChargingProfileType
	Direction	OUT
	Comment	ChargingProfile as per ISO15118-2.
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	PreChargeParams	
Comment	Get pre charge parameters.	
Relates to	–	
Variation	–	
Parameters	DC_EVStatus	
	Type	ISO15118Chrg_DC_EVStatusType
	Direction	IN
	Comment	DC_EVSEStatus as per ISO15118-2
	Variation	–
	EVTargetVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentVoltage as per ISO15118-2.
	Variation	–
	EVTargetCurrent	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentCurrent as per ISO15118-2.
	Variation	–
	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	DC_EVSEStatus	
	Type	ISO15118Chrg_DC_EVSEStatusType
	Direction	IN
	Comment	DC_EVSEStatus as per ISO15118-2
	Variation	–
	EVSEPresentVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentVoltage as per ISO15118-2
	Variation	–

▽

△

Possible Errors	E_OK E_NOT_OK

Operation	SeccConnectionParams	
Comment	Acquire SeccIp, Secc Port Number and TLS connection information.	
Relates to	–	
Variation	–	
Parameters	SeccIpAddr	
	Type	uint64
	Direction	IN
	Comment	This parameter provides the Secc Ip address to the application software.
	Variation	–
	SeccPortNumber	
	Type	uint16
	Direction	IN
	Comment	This parameter provides the Secc port number to the application software.
	Variation	–
	TLSInfo	
	Type	ISO15118Chrg_StringType
	Direction	IN
	Comment	TLS information, such as version info.
	Variation	–
	IPAddressAssignmentSucceeded	
	Type	boolean
	Direction	IN
	Comment	Value 1 for IP address assigned, Value 0 for IP address not assigned
	Variation	–
	TLSAssignmentSucceeded	
	Type	boolean
	Direction	IN
	Comment	Value 1 for TLS successful, Value 0 for TLS unsuccessful
	Variation	–
Possible Errors	ISO15118CHRG_CONNECTIONDETAILSAVAILABLE ISO15118CHRG_CONNECTIONDETAILSNOTAVAILABLE	

Operation	ServiceDetailParams	
Comment	Get ServiceId	
Relates to	–	
Variation	–	
Parameters	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	ServiceParameterListPtr	
	Type	ISO15118Chrg_ServiceParameterListTypePtr
	Direction	IN

▽

△

	Comment	ServiceParameterList as per ISO15118-2
	Variation	–
	ServiceId	
	Type	uint16
	Direction	OUT
	Comment	ServiceId as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	ServiceDiscoveryParams	
Comment	Get ServiceScope and ServiceCategory.	
Relates to	–	
Variation	–	
Parameters	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	PaymentOptionList	
	Type	ISO15118Chrg_PaymentOptionListType
	Direction	IN
	Comment	PaymentOptionList as per ISO15118-2
	Variation	–
	ChargeService	
	Type	ISO15118Chrg_ChargeServiceType
	Direction	IN
	Comment	Charge service as per ISO15118-2
	Variation	–
	ServiceList	
	Type	ISO15118Chrg_ServiceListType
	Direction	IN
	Comment	Service list as per ISO15118-2
	Variation	–
	ServiceScope	
	Type	ISO15118Chrg_ServiceScopeType
	Direction	OUT
	Comment	ServiceScope as per ISO15118-2
	Variation	–
	ServiceCategory	
	Type	ISO15118Chrg_ServiceCategoryType
	Direction	OUT
	Comment	ServiceCategory as per ISO15118-2
	Variation	–

▽

△

Possible Errors	E_OK E_NOT_OK

Operation	SessionSetupParams	
Comment	Handle EVCCID for session setup.	
Relates to	–	
Variation	–	
Parameters	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	Response code as per ISO15118-2
	Variation	–
	EVSETimeStamp	
	Type	uint32
	Direction	IN
	Comment	EVSETimeStamp as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	SessionStopParams	
Comment	Get ChargingSession.	
Relates to	–	
Variation	–	
Parameters	ResponseCodeType	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	ResponseCode as per ISO15118-2
	Variation	–
	ChargingSession	
	Type	ISO15118Chrg_ChargingSessionType
	Direction	OUT
	Comment	ChargingSession as per ISO15118-2.
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	SlacStateParams	
Comment	Acquire SLAC information.	
Relates to	–	
Variation	–	
Parameters	EVSEState	
	Type	boolean
	Direction	IN
	Comment	1: EVSE_FOUND , 0: EVSE_NOT_FOUND
	Variation	–

▽

△

Possible Errors	ISO15118CHRG_SLACSTATEAVAILABLE ISO15118CHRG_SLACSTATENOTAVAILABLE

Operation	StateParams	
Comment	Provides the current state of the ISO15118 state machine	
Relates to	–	
Variation	–	
Parameters	ChargingSequenceState	
	Type	ISO15118Chrg_ChargingSequenceStateType
	Direction	IN
	Comment	This enumeration provides the state information.
	Variation	–
	ChargingSequenceSubState	
	Type	ISO15118Chrg_ChargingSequenceSubStateType
	Direction	IN
	Comment	–
	Variation	–
Possible Errors	ISO15118CHRG_STATEDETAILSAVAILABLE ISO15118CHRG_STATEDETAILSNOTAVAILABLE	

Operation	SupportedAppProtocolParams	
Comment	Get SupportedAppProtocol parameters.	
Relates to	–	
Variation	–	
Parameters	AppProtocol	
	Type	ISO15118Chrg_AppProtocolType_ArrayType
	Direction	OUT
	Comment	AppProtocol as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	WeldingDetectionParams	
Comment	Get DC_EVStatus.	
Relates to	–	
Variation	–	
Parameters	EVSEPresentVoltage	
	Type	ISO15118Chrg_PhysicalValueType
	Direction	IN
	Comment	EVSEPresentVoltage as per ISO15118-2
	Variation	–
	ResponseCode	
	Type	ISO15118Chrg_ResponseCodeType
	Direction	IN
	Comment	ResponseCode as per ISO15118-2
	Variation	–
	DC_EVSEStatus	

▽

△

	Type	ISO15118Chrg_DC_EVSEStatusType
	Direction	IN
	Comment	DC_EVSEStatus as per ISO15118-2
	Variation	–
Possible Errors	E_OK E_NOT_OK	

⌋

8.6.2 Charge Control

[CP_SWS_ISO15118Chrg_00149] Definition of ClientServerInterface ChargeControl

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ChargeControl (draft)		
Comment	Using this interface, the application software can fetch connection details from the ISO15118. **Tags:** atp.Status=draft		
IsService	true		
Variation	–		
Possible Errors	0	E_OK	Operation successful
	1	E_NOT_OK	Operation failed
	4	ISO15118CHRG_CONNECTIONDETAIL-SAVAILABLE	Connection details available
	5	ISO15118CHRG_CONNECTIONDETAIL-SNOTAVAILABLE	Connection details not available
	8	ISO15118CHRG_STATEAVAILABLE	State available
	9	ISO15118CHRG_STATEUNAVAILABLE	State not available

Operation	SetChargeState	
Comment	The application software can control the state machine of the ISO15118 charging manager using this operation.	
Relates to	–	
Variation	–	
Parameters	StateMachineControl	
	Type	ISO15118Chrg_StateMachineControlType
	Direction	IN
	Comment	This enumeration provides the different control states.
	Variation	–
Possible Errors	E_OK E_NOT_OK	

Operation	SetCpLineStatus	
Comment	Acquire Cp line status information from application software.	
Relates to	–	
Variation	–	
Parameters	CpLineStatus	
	Type	boolean
	Direction	IN
	Comment	1: CP_LINE_ACTIVE , 0: CP_LINE_INACTIVE
	Variation	–
Possible Errors	ISO15118CHRG_STATEAVAILABLE ISO15118CHRG_STATEUNAVAILABLE	

⌋

8.7 Ports Interfaces

The necessary ports are provided here.

8.7.1 Required Service Port

[CP_SWS_ISO15118Chrg_00152] Definition of Port ChargeParametersPort required by module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ChargeParametersPort (draft)		
Kind	RequiredPort	***Interface***	ChargeParameters
Description	This is a required port at the application software side using which Tx\Rx parameters are exchanged via V2G messages. **Tags:** atp.Status=draft		
Variation	–		

⌋

8.7.2 Provided Service Port

[CP_SWS_ISO15118Chrg_00151] Definition of Port ChargeControlPort provided by module ISO15118Chrg

Status: DRAFT
Upstream requirements: SRS_BSW_00305

⌈

Name	ChargeControlPort (draft)		
Kind	ProvidedPort	***Interface***	ChargeControl
Description	This is a provided port at the ISO15118 BSW module to control the state of the ISO15118, and fetch connection details. **Tags:** atp.Status=draft		
Variation	–		

⌋

9 Sequence diagrams

9.1 Data Link Indication

Figure 9.1: Data Link Indication

9.2 Start IP Address Assignment

Figure 9.2: IP Address Assignment

9.3 SECC Discovery Process

Figure 9.3: SECC Discovery

9.4 Transmission

Figure 9.4: Transmission

9.5 Reception

Figure 9.5: Reception

10 Configuration specification

In general, this chapter defines configuration parameters and their clustering into containers. In order to support the specification Chapter 10.1 describes fundamentals. It also specifies a template (table) you shall use for the parameter specification. We intend to leave Chapter 10.1 in the specification to guarantee comprehension.

Chapter 10.2 specifies the structure (containers) and the parameters of the module ISO15118Chrg.

Chapter 10.3 specifies published information of the module ISO15118Chrg.

10.1 How to read this chapter

For details refer to [13] Chapter 10.1 *"Introduction to configuration specification"*.

10.2 Containers and configuration parameters

10.2.1 ISO15118Chrg

[ECUC_ISO15118Chrg_00001] Definition of EcucModuleDef ISO15118Chrg

Status: DRAFT

⌈

Module Name	ISO15118Chrg
Description	Configuration of the ISO15118 module.
Post-Build Selectable Support	false
Post-Build Loadable Support	false

Included Containers		
Container Name	**Multiplicity**	**Description**
ISO15118ChrgGeneral	1	General configuration of the ISO15118 module. **Tags:** atp.Status=draft
ISO15118ChrgService	1	Configuration paramters to configure the ISO15118ChrgService **Tags:** atp.Status=draft
ISO15118ChrgTimer	0..*	Configuration of ISO15118Chrg Timers. **Tags:** atp.Status=draft
ISO15118ChrgV2GTP	0..1	Configuration of the Vehicle to Grid Transport Protocol **Tags:** atp.Status=draft

⌋

Figure 10.1: Top level configuration structure of ISO15118Chrg

10.2.2 ISO15118ChrgGeneral

[ECUC_ISO15118Chrg_00009] Definition of EcucParamConfContainerDef ISO15118ChrgGeneral

Status: DRAFT

⌈

Container Name	ISO15118ChrgGeneral
Parent Container	ISO15118Chrg
Upstream mapping defined	–
Description	General configuration of the ISO15118 module. **Tags:** atp.Status=draft
Multiplicity	1
Pre-Compile only	true
Configuration Parameters	

Included Parameters		
Parameter Name	**Multiplicity**	**ECUC ID**
ISO15118ChrgDevErrorDetect	1	[ECUC_ISO15118Chrg_00029]
ISO15118ChrgMainFunctionCycleTime	1	[ECUC_ISO15118Chrg_00031]

No Included Containers

⌋

[ECUC_ISO15118Chrg_00029] Definition of EcucBooleanParamDef ISO15118ChrgDevErrorDetect

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgDevErrorDetect
Parent Container	ISO15118ChrgGeneral
Upstream mapping defined	–
Description	Switches the development error detection and notification on or off. • true: detection and notification is enabled. • false: detection and notification is disabled. **Tags:** atp.Status=draft
Multiplicity	1
Type	EcucBooleanParamDef
Default value	false
Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00031] Definition of EcucFloatParamDef ISO15118ChrgMainFunctionCycleTime

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgMainFunctionCycleTime	
Parent Container	ISO15118ChrgGeneral	
Upstream mapping defined	–	
Description	This parameter defines the cycle time in seconds of the periodic calling of ISO15118 Chrg main function. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucFloatParamDef	
Range	]0 .. INF[	
Default value	–	
Pre-Compile only	true	

⌋

Figure 10.2: General Configuration parameters of ISO15118Chrg

10.2.3 ISO15118ChrgTimer

[ECUC_ISO15118Chrg_00033] Definition of EcucParamConfContainerDef ISO15118ChrgTimer

Status: DRAFT

⌈

Container Name	ISO15118ChrgTimer
Parent Container	ISO15118Chrg
Upstream mapping defined	–
Description	Configuration of ISO15118Chrg Timers. **Tags:** atp.Status=draft
Multiplicity	0..*
Pre-Compile only	true
Configuration Parameters	

Included Parameters		
Parameter Name	**Multiplicity**	**ECUC ID**
ISO15118ChrgV2gEvccMsgTimeout	1	[ECUC_ISO15118Chrg_00013]

No Included Containers

⌋

[ECUC_ISO15118Chrg_00013] Definition of EcucFloatParamDef ISO15118Chrg V2gEvccMsgTimeout

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2gEvccMsgTimeout
Parent Container	ISO15118ChrgTimer
Upstream mapping defined	–

▽

△

Description	This parameter define the maximum time that is allowed between a request and its corresponding response message. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucFloatParamDef	
Range	[-INF .. INF]	
Default value	–	
Pre-Compile only	true	

⌋

Figure 10.3: ISO15118Chrg Timers

10.2.4 ISO15118ChrgV2GTP

[ECUC_ISO15118Chrg_00010] Definition of EcucParamConfContainerDef ISO15118ChrgV2GTP

Status: DRAFT

⌈

Container Name	ISO15118ChrgV2GTP
Parent Container	ISO15118Chrg
Upstream mapping defined	–
Description	Configuration of the Vehicle to Grid Transport Protocol **Tags:** atp.Status=draft
Multiplicity	0..1
Pre-Compile only	true
Configuration Parameters	

Included Parameters		
Parameter Name	**Multiplicity**	**ECUC ID**
ISO15118ChrgV2GSrcTcpDataRef	1	[ECUC_ISO15118Chrg_00026]
ISO15118ChrgV2GUdpSdpClientRef	0..1	[ECUC_ISO15118Chrg_00034]

Included Containers		
Container Name	**Multiplicity**	**Description**
ISO15118ChrgV2GTPPdu	0..1	Contains the configuration parameters of the ISO15118 module's Pdus that are exchanged between ISO15118 and the PduR. **Tags:** atp.Status=draft

⌋

[ECUC_ISO15118Chrg_00026] Definition of EcucReferenceDef ISO15118ChrgV2GSrcTcpDataRef

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GSrcTcpDataRef
Parent Container	ISO15118ChrgV2GTP
Upstream mapping defined	–
Description	Reference to SoAdSocketConnectionGroup to access the local IP address and TCP port for building the endpoint option to send V2G messages. **Tags:** atp.Status=draft
Multiplicity	1
Type	Reference to SoAdSocketConnectionGroup
Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00034] Definition of EcucReferenceDef ISO15118ChrgV2GUdpSdpClientRef

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GUdpSdpClientRef
Parent Container	ISO15118ChrgV2GTP
Upstream mapping defined	–
Description	Reference to SoAdSocketConnectionGroup to access the local IP address and Udp port for building the endpoint option for SECC discovery process. **Tags:** atp.Status=draft
Multiplicity	0..1
Type	Reference to SoAdSocketConnectionGroup
Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00035] Definition of EcucParamConfContainerDef ISO15118ChrgV2GTPPdu

Status: DRAFT

⌈

Container Name	ISO15118ChrgV2GTPPdu	
Parent Container	ISO15118ChrgV2GTP	
Upstream mapping defined	[14, CP_TPS_SystemTemplate]	
Description	Contains the configuration parameters of the ISO15118 module's Pdus that are exchanged between ISO15118 and the PduR. **Tags:** atp.Status=draft	
Multiplicity	0..1	
Post-Build Multiplicity	Loadable	Selectable
Configuration Parameters		

Included Parameters		
Parameter Name	**Multiplicity**	**ECUC ID**
ISO15118ChrgV2GTPPduHandleId	0..1	[ECUC_ISO15118Chrg_00023]
ISO15118ChrgV2GTPPduPayloadType	1	[ECUC_ISO15118Chrg_00027]
ISO15118ChrgV2GTPPduProtocolVersion	1	[ECUC_ISO15118Chrg_00028]
ISO15118ChrgV2GTPPduRef	1	[ECUC_ISO15118Chrg_00024]

No Included Containers

⌋

[ECUC_ISO15118Chrg_00023] Definition of EcucIntegerParamDef ISO15118Chrg V2GTPPduHandleId

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GTPPduHandleId
Parent Container	ISO15118ChrgV2GTPPdu
Upstream mapping defined	–
Description	PDU identifier assigned by ISO15118Chrg module. The parameter is required by the API calls ISO15118_V2GTpRxIndication, ISO15118_V2GTpCopyRxData, ISO15118_V2GTpStartOfReception to receive I-PDUs from the PduR. For Tx-I-PDUs this handle Id is used for the APIs calls ISO15118_V2GTpTxConfirmation, ISO15118_V2GTpCopy TxData to transmit respectively confirm transmissions of I-PDUs. **Tags:** atp.Status=draft
Multiplicity	0..1
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)
Range	0 .. 65535
Default value	–
Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00027] Definition of EcucIntegerParamDef ISO15118Chrg V2GTPPduPayloadType

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GTPPduPayloadType
Parent Container	ISO15118ChrgV2GTPPdu
Upstream mapping defined	–
Description	This parameter contains the information about how to decode the payload following the V2GTP header. **Tags:** atp.Status=draft
Multiplicity	1
Type	EcucIntegerParamDef
Range	0 .. 65535
Default value	–

▽

△

Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00028] Definition of EcucIntegerParamDef ISO15118Chrg V2GTPPduProtocolVersion

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GTPPduProtocolVersion
Parent Container	ISO15118ChrgV2GTPPdu
Upstream mapping defined	–
Description	This parameter specifies the protocol version of the V2GTP message that is transmitted in the Pdu. **Tags:** atp.Status=draft
Multiplicity	1
Type	EcucIntegerParamDef
Range	0 .. 255
Default value	–
Pre-Compile only	true

⌋

[ECUC_ISO15118Chrg_00024] Definition of EcucReferenceDef ISO15118ChrgV2 GTPPduRef

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgV2GTPPduRef
Parent Container	ISO15118ChrgV2GTPPdu
Upstream mapping defined	–
Description	Reference to the "global" Pdu structure to allow harmonization of handle IDs in the COM-Stack. **Tags:** atp.Status=draft
Multiplicity	1
Type	Reference to Pdu
Pre-Compile only	true

⌋

Figure 10.4: Configuration of V2G protocol

10.2.5 ISO15118ChrgService

[ECUC_ISO15118Chrg_00032] Definition of EcucParamConfContainerDef ISO15118ChrgService

Status: DRAFT

⌈

Container Name	ISO15118ChrgService
Parent Container	ISO15118Chrg
Upstream mapping defined	–

▽

△

Description	Configuration paramters to configure the ISO15118ChrgService **Tags:** atp.Status=draft
Multiplicity	1
Pre-Compile only	true
Configuration Parameters	

Included Parameters		
Parameter Name	**Multiplicity**	**ECUC ID**
ISO15118ChrgSoAdSocketConnectionRef	1	[ECUC_ISO15118Chrg_00025]

No Included Containers

⌋

[ECUC_ISO15118Chrg_00025] Definition of EcucReferenceDef ISO15118ChrgSoAdSocketConnectionRef

Status: DRAFT

⌈

Parameter Name	ISO15118ChrgSoAdSocketConnectionRef
Parent Container	ISO15118ChrgService
Upstream mapping defined	–
Description	Reference to SoAdSocketConnection, which specifies the socket connection of the socket connection group. The ISO15118Chrg receives the SoConId for API calls between ISO15118Chrg and SoAd. The ISO15118Chrg shall use this parameter to access TLS information. Since the referenced SoAdSocketConnection is part of a SoAdSocketConnectionGroup the SoAdSocketTcpTlsConnectionRef of the same SoAdSocketConnectionGroup can be used to retrieve the TLS information. **Tags:** atp.Status=draft
Multiplicity	1
Type	Symbolic name reference to SoAdSocketConnection
Pre-Compile only	true

⌋

Figure 10.5: Configuration of ISO15118Chrg services

10.3 Published Information

For details refer to [13] Chapter 10.3 *"Published Information"*.

A Change history of AUTOSAR traceable items

A.1 Traceable item history of this document according to AUTOSAR Release R26-11

A.1.1 Added Specification Items in R26-11

none

A.1.2 Changed Specification Items in R26-11

Number	Heading
[CP_SWS_ISO15118Chrg_00133]	Definition of callback function ISO15118Chrg_V2GTpRx Indication
[CP_SWS_ISO15118Chrg_00143]	Definition of callback function ISO15118Chrg_V2GTpTx Confirmation

Table A.1: Changed Specification Items in R26-11

A.1.3 Deleted Specification Items in R26-11

Number	Heading
[ECUC_ISO15118Chrg_00030]	Definition of EcucBooleanParamDef ISO15118ChrgVersion InfoApi

Table A.2: Deleted Specification Items in R26-11

A.2 Traceable item history of this document according to AUTOSAR Release R25-11

A.2.1 Added Specification Items in R25-11

none

A.2.2 Changed Specification Items in R25-11

none

A.2.3 Deleted Specification Items in R25-11

none

A.3 Traceable item history of this document according to AUTOSAR Release R24-11

A.3.1 Added Specification Items in R24-11

Number	Heading
[CP_SWS_ISO15118Chrg_00149]	Definition of ClientServerInterface ChargeControl
[CP_SWS_ISO15118Chrg_00150]	Definition of ClientServerInterface ChargeParameters
[CP_SWS_ISO15118Chrg_00151]	Definition of Port ChargeControlPort provided by module ISO15118Chrg
[CP_SWS_ISO15118Chrg_00152]	Definition of Port ChargeParametersPort required by module ISO15118Chrg
[CP_SWS_ISO15118Chrg_00153]	Definition of ImplementationDataType ISO15118Chrg_AC_EVChargeParameterType
[CP_SWS_ISO15118Chrg_00154]	Definition of ImplementationDataType ISO15118Chrg_AC_EVSEChargeParameterType
[CP_SWS_ISO15118Chrg_00155]	Definition of ImplementationDataType ISO15118Chrg_AC_EVSEStatusType
[CP_SWS_ISO15118Chrg_00156]	Definition of ImplementationDataType ISO15118Chrg_AppProtocolType
[CP_SWS_ISO15118Chrg_00157]	Definition of ImplementationDataType ISO15118Chrg_AppProtocolType_ArrayType
[CP_SWS_ISO15118Chrg_00158]	Definition of ImplementationDataType ISO15118Chrg_CertificateChainType
[CP_SWS_ISO15118Chrg_00159]	Definition of ImplementationDataType ISO15118Chrg_ChargeProgressType
[CP_SWS_ISO15118Chrg_00160]	Definition of ImplementationDataType ISO15118Chrg_ChargeServiceType
[CP_SWS_ISO15118Chrg_00161]	Definition of ImplementationDataType ISO15118Chrg_ChargingProfileType
[CP_SWS_ISO15118Chrg_00162]	Definition of ImplementationDataType ISO15118Chrg_ChargingSequenceStateType
[CP_SWS_ISO15118Chrg_00163]	Definition of ImplementationDataType ISO15118Chrg_ChargingSequenceSubStateType
[CP_SWS_ISO15118Chrg_00164]	Definition of ImplementationDataType ISO15118Chrg_ChargingSessionType
[CP_SWS_ISO15118Chrg_00165]	Definition of ImplementationDataType ISO15118Chrg_ConsumptionCostType

▽

△

Number	Heading
[CP_SWS_ISO15118Chrg_00166]	Definition of ImplementationDataType ISO15118Chrg_CostKindType
[CP_SWS_ISO15118Chrg_00167]	Definition of ImplementationDataType ISO15118Chrg_CostType
[CP_SWS_ISO15118Chrg_00168]	Definition of ImplementationDataType ISO15118Chrg_DC_EVChargeParameterType
[CP_SWS_ISO15118Chrg_00169]	Definition of ImplementationDataType ISO15118Chrg_DC_EVErrorCodeType
[CP_SWS_ISO15118Chrg_00170]	Definition of ImplementationDataType ISO15118Chrg_DC_EVPowerDeliveryParameterType
[CP_SWS_ISO15118Chrg_00171]	Definition of ImplementationDataType ISO15118Chrg_DC_EVSEChargeParameterType
[CP_SWS_ISO15118Chrg_00172]	Definition of ImplementationDataType ISO15118Chrg_DC_EVSEStatusCodeType
[CP_SWS_ISO15118Chrg_00173]	Definition of ImplementationDataType ISO15118Chrg_DC_EVSEStatusType
[CP_SWS_ISO15118Chrg_00174]	Definition of ImplementationDataType ISO15118Chrg_DC_EVStatusType
[CP_SWS_ISO15118Chrg_00175]	Definition of ImplementationDataType ISO15118Chrg_eMAIDType
[CP_SWS_ISO15118Chrg_00176]	Definition of ImplementationDataType ISO15118Chrg_EnergyTransferModeType
[CP_SWS_ISO15118Chrg_00177]	Definition of ImplementationDataType ISO15118Chrg_EntryType
[CP_SWS_ISO15118Chrg_00178]	Definition of ImplementationDataType ISO15118Chrg_EVSEIdType
[CP_SWS_ISO15118Chrg_00179]	Definition of ImplementationDataType ISO15118Chrg_EVSENotificationType
[CP_SWS_ISO15118Chrg_00180]	Definition of ImplementationDataType ISO15118Chrg_IsolationLevelType
[CP_SWS_ISO15118Chrg_00181]	Definition of ImplementationDataType ISO15118Chrg_MeterInfoType
[CP_SWS_ISO15118Chrg_00182]	Definition of ImplementationDataType ISO15118Chrg_ParameterSetType
[CP_SWS_ISO15118Chrg_00183]	Definition of ImplementationDataType ISO15118Chrg_ParameterSetType_ArrayType
[CP_SWS_ISO15118Chrg_00184]	Definition of ImplementationDataType ISO15118Chrg_ParameterType
[CP_SWS_ISO15118Chrg_00185]	Definition of ImplementationDataType ISO15118Chrg_PaymentOptionListType
[CP_SWS_ISO15118Chrg_00186]	Definition of ImplementationDataType ISO15118Chrg_PaymentOptionType

▽

△

Number	Heading
[CP_SWS_ISO15118Chrg_00187]	Definition of ImplementationDataType ISO15118Chrg_ PhysicalValueType
[CP_SWS_ISO15118Chrg_00188]	Definition of ImplementationDataType ISO15118Chrg_Pmax ScheduleEntryType
[CP_SWS_ISO15118Chrg_00189]	Definition of ImplementationDataType ISO15118Chrg_PMax ScheduleType_ArrayType
[CP_SWS_ISO15118Chrg_00190]	Definition of ImplementationDataType ISO15118Chrg_PMax ScheduleTypePtr
[CP_SWS_ISO15118Chrg_00191]	Definition of ImplementationDataType ISO15118Chrg_Profile EntryType
[CP_SWS_ISO15118Chrg_00192]	Definition of ImplementationDataType ISO15118Chrg_ ProtocolNameSpaceType
[CP_SWS_ISO15118Chrg_00193]	Definition of ImplementationDataType ISO15118Chrg_ RelativeTimeIntervalType
[CP_SWS_ISO15118Chrg_00194]	Definition of ImplementationDataType ISO15118Chrg_ ResponseCodeType
[CP_SWS_ISO15118Chrg_00195]	Definition of ImplementationDataType ISO15118Chrg_Sales TariffEntryType
[CP_SWS_ISO15118Chrg_00196]	Definition of ImplementationDataType ISO15118Chrg_Sales TariffEntryType_ArrayType
[CP_SWS_ISO15118Chrg_00197]	Definition of ImplementationDataType ISO15118Chrg_Sales TariffType
[CP_SWS_ISO15118Chrg_00198]	Definition of ImplementationDataType ISO15118Chrg_ SAScheduleListType
[CP_SWS_ISO15118Chrg_00199]	Definition of ImplementationDataType ISO15118Chrg_ SAScheduleTupleType
[CP_SWS_ISO15118Chrg_00201]	Definition of ImplementationDataType ISO15118Chrg_ SelectedServiceType
[CP_SWS_ISO15118Chrg_00202]	Definition of ImplementationDataType ISO15118Chrg_ ServiceCategoryType
[CP_SWS_ISO15118Chrg_00203]	Definition of ImplementationDataType ISO15118Chrg_ ServiceListType
[CP_SWS_ISO15118Chrg_00204]	Definition of ImplementationDataType ISO15118Chrg_ ServiceParameterListTypePtr
[CP_SWS_ISO15118Chrg_00205]	Definition of ImplementationDataType ISO15118Chrg_ ServiceScopeType
[CP_SWS_ISO15118Chrg_00206]	Definition of ImplementationDataType ISO15118Chrg_State MachineControlType
[CP_SWS_ISO15118Chrg_00207]	Definition of ImplementationDataType ISO15118Chrg_String Type
[CP_SWS_ISO15118Chrg_00208]	Definition of ImplementationDataType ISO15118Chrg_Sub CertificatesType

▽

△

Number	Heading
[CP_SWS_ISO15118Chrg_00209]	Definition of ImplementationDataType ISO15118Chrg_ SupportedEnergyTransferModeType
[CP_SWS_ISO15118Chrg_00210]	Definition of ImplementationDataType ISO15118Chrg_Tariff DescriptionType
[CP_SWS_ISO15118Chrg_00211]	Definition of ImplementationDataType ISO15118Chrg_Unit MultiplierType
[CP_SWS_ISO15118Chrg_00212]	Definition of ImplementationDataType ISO15118Chrg_Unit SymbolType
[CP_SWS_ISO15118Chrg_00214]	Definition of ImplementationDataType ISO15118Chrg_ SelectedServiceListType
[CP_SWS_ISO15118Chrg_00215]	General Requirement
[CP_SWS_ISO15118Chrg_00216]	General Requirement
[CP_SWS_ISO15118Chrg_00217]	General Requirement
[CP_SWS_ISO15118Chrg_00218]	General Requirement
[CP_SWS_ISO15118Chrg_00219]	General Requirement
[CP_SWS_ISO15118Chrg_00220]	General Requirement
[SWS_ISO15118Chrg_00092]	DRAFT

Table A.3: Added Specification Items in R24-11

A.3.2 Changed Specification Items in R24-11

none

A.3.3 Deleted Specification Items in R24-11

Number	Heading
[CP_SWS_ISO15118Chrg_00117]	Definition of datatype ChrgM_ResponseCodeType
[CP_SWS_ISO15118Chrg_00118]	Definition of datatype ChrgM_ErrorHandlerType
[CP_SWS_ISO15118Chrg_00123]	Definition of API function ChrgM_StartProcess
[CP_SWS_ISO15118Chrg_00135]	Definition of API function ChrgM_SessionSetupIndication
[CP_SWS_ISO15118Chrg_00136]	Definition of API function ChrgM_PaymentServiceSelectionIndication
[CP_SWS_ISO15118Chrg_00137]	Definition of API function ChrgM_SessionStopIndication
[CP_SWS_ISO15118Chrg_00138]	Definition of API function ChrgM_ErrorIndication
[CP_SWS_ISO15118Chrg_00139]	Definition of API function ChrgM_CpLineStatus

Table A.4: Deleted Specification Items in R24-11

A.4 Traceable item history of this document according to AUTOSAR Release R23-11

A.4.1 Added Specification Items in R23-11

[CP_SWS_ISO15118Chrg_00001] [CP_SWS_ISO15118Chrg_00002]
[CP_SWS_ISO15118Chrg_00003] [CP_SWS_ISO15118Chrg_00004]
[CP_SWS_ISO15118Chrg_00005] [CP_SWS_ISO15118Chrg_00006]
[CP_SWS_ISO15118Chrg_00007] [CP_SWS_ISO15118Chrg_00008]
[CP_SWS_ISO15118Chrg_00009] [CP_SWS_ISO15118Chrg_00010]
[CP_SWS_ISO15118Chrg_00011] [CP_SWS_ISO15118Chrg_00012]
[CP_SWS_ISO15118Chrg_00013] [CP_SWS_ISO15118Chrg_00014]
[CP_SWS_ISO15118Chrg_00015] [CP_SWS_ISO15118Chrg_00016]
[CP_SWS_ISO15118Chrg_00017] [CP_SWS_ISO15118Chrg_00018]
[CP_SWS_ISO15118Chrg_00019] [CP_SWS_ISO15118Chrg_00020]
[CP_SWS_ISO15118Chrg_00021] [CP_SWS_ISO15118Chrg_00022]
[CP_SWS_ISO15118Chrg_00023] [CP_SWS_ISO15118Chrg_00024]
[CP_SWS_ISO15118Chrg_00025] [CP_SWS_ISO15118Chrg_00026]
[CP_SWS_ISO15118Chrg_00027] [CP_SWS_ISO15118Chrg_00028]
[CP_SWS_ISO15118Chrg_00029] [CP_SWS_ISO15118Chrg_00030]
[CP_SWS_ISO15118Chrg_00031] [CP_SWS_ISO15118Chrg_00032]
[CP_SWS_ISO15118Chrg_00033] [CP_SWS_ISO15118Chrg_00034]
[CP_SWS_ISO15118Chrg_00035] [CP_SWS_ISO15118Chrg_00036]
[CP_SWS_ISO15118Chrg_00037] [CP_SWS_ISO15118Chrg_00038]
[CP_SWS_ISO15118Chrg_00039] [CP_SWS_ISO15118Chrg_00040]
[CP_SWS_ISO15118Chrg_00041] [CP_SWS_ISO15118Chrg_00042]
[CP_SWS_ISO15118Chrg_00043] [CP_SWS_ISO15118Chrg_00044]
[CP_SWS_ISO15118Chrg_00045] [CP_SWS_ISO15118Chrg_00046]
[CP_SWS_ISO15118Chrg_00047] [CP_SWS_ISO15118Chrg_00048]
[CP_SWS_ISO15118Chrg_00049] [CP_SWS_ISO15118Chrg_00050]
[CP_SWS_ISO15118Chrg_00051] [CP_SWS_ISO15118Chrg_00052]
[CP_SWS_ISO15118Chrg_00053] [CP_SWS_ISO15118Chrg_00054]
[CP_SWS_ISO15118Chrg_00055] [CP_SWS_ISO15118Chrg_00056]
[CP_SWS_ISO15118Chrg_00057] [CP_SWS_ISO15118Chrg_00058]
[CP_SWS_ISO15118Chrg_00059] [CP_SWS_ISO15118Chrg_00060]
[CP_SWS_ISO15118Chrg_00061] [CP_SWS_ISO15118Chrg_00062]
[CP_SWS_ISO15118Chrg_00063] [CP_SWS_ISO15118Chrg_00064]
[CP_SWS_ISO15118Chrg_00065] [CP_SWS_ISO15118Chrg_00066]
[CP_SWS_ISO15118Chrg_00067] [CP_SWS_ISO15118Chrg_00068]
[CP_SWS_ISO15118Chrg_00069] [CP_SWS_ISO15118Chrg_00070]
[CP_SWS_ISO15118Chrg_00071] [CP_SWS_ISO15118Chrg_00072]
[CP_SWS_ISO15118Chrg_00073] [CP_SWS_ISO15118Chrg_00074]
[CP_SWS_ISO15118Chrg_00075] [CP_SWS_ISO15118Chrg_00076]
[CP_SWS_ISO15118Chrg_00077] [CP_SWS_ISO15118Chrg_00078]
[CP_SWS_ISO15118Chrg_00079] [CP_SWS_ISO15118Chrg_00080]
[CP_SWS_ISO15118Chrg_00081] [CP_SWS_ISO15118Chrg_00082]

[CP_SWS_ISO15118Chrg_00084] [CP_SWS_ISO15118Chrg_00085]
[CP_SWS_ISO15118Chrg_00086] [CP_SWS_ISO15118Chrg_00087]
[CP_SWS_ISO15118Chrg_00089] [CP_SWS_ISO15118Chrg_00090]
[CP_SWS_ISO15118Chrg_00091] [CP_SWS_ISO15118Chrg_00113]
[CP_SWS_ISO15118Chrg_00114] [CP_SWS_ISO15118Chrg_00115]
[CP_SWS_ISO15118Chrg_00116] [CP_SWS_ISO15118Chrg_00117]
[CP_SWS_ISO15118Chrg_00118] [CP_SWS_ISO15118Chrg_00119]
[CP_SWS_ISO15118Chrg_00122] [CP_SWS_ISO15118Chrg_00123]
[CP_SWS_ISO15118Chrg_00125] [CP_SWS_ISO15118Chrg_00128]
[CP_SWS_ISO15118Chrg_00131] [CP_SWS_ISO15118Chrg_00133]
[CP_SWS_ISO15118Chrg_00135] [CP_SWS_ISO15118Chrg_00136]
[CP_SWS_ISO15118Chrg_00137] [CP_SWS_ISO15118Chrg_00138]
[CP_SWS_ISO15118Chrg_00139] [CP_SWS_ISO15118Chrg_00140]
[CP_SWS_ISO15118Chrg_00141] [CP_SWS_ISO15118Chrg_00143]
[CP_SWS_ISO15118Chrg_00145] [CP_SWS_ISO15118Chrg_00146]
[CP_SWS_ISO15118Chrg_00147] [CP_SWS_ISO15118Chrg_00148]

A.4.2 Changed Specification Items in R23-11

none

A.4.3 Deleted Specification Items in R23-11

none