Road vehicles — Vehicle to grid communication interface —

Network and application protocol specification for Siemens — Volvo OppCharge implementation

Version: 1.3.0

ACD extension for OppCharge on ISO/IEC DIS 15118-2 (2012)
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<table>
<thead>
<tr>
<th>Annex</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>Message examples</td>
<td>67</td>
</tr>
<tr>
<td>E</td>
<td>Application of certificates</td>
<td>68</td>
</tr>
<tr>
<td>F</td>
<td>Security appliances and their associated certificates</td>
<td>69</td>
</tr>
<tr>
<td>G</td>
<td>Simplified Certificate Management in Trusted Environment</td>
<td>70</td>
</tr>
<tr>
<td>H</td>
<td>Certificate profiles</td>
<td>71</td>
</tr>
<tr>
<td>I</td>
<td>Using Contract Certificates for XML encryption</td>
<td>72</td>
</tr>
<tr>
<td>J</td>
<td>Use of OEM Provisioning Certificates</td>
<td>73</td>
</tr>
<tr>
<td>K</td>
<td>Summary of requirements</td>
<td>74</td>
</tr>
</tbody>
</table>
Foreword

This clause of ISO/IEC DIS 15118-2 is applicable.
Introduction

This clause of ISO/IEC DIS 15118-2 is applicable.
Road vehicles — Vehicle to grid communication interface —

Network and application protocol requirements for OppCharge

1 Scope

This clause of ISO/IEC DIS 15118-2 is applicable.

2 Normative references

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Addition:


([https://www.oppcharge.org/dok/OppCharge_CoreSpecification.pdf](https://www.oppcharge.org/dok/OppCharge_CoreSpecification.pdf))

For detailed information refer to OppCharge web site: [https://www.oppcharge.org/](https://www.oppcharge.org/)


3 Terms and definitions

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Addition:

**automatic connection device**

**ACD**

components supporting the automatic connection and disconnection process for conductive energy transfer between an EV and EV supply equipment

**pantograph**

In context of OppCharge pantograph specifies a so called top-down pantograph. The pantograph is mounted on a mast of the charging station. For charging the pantograph is moved down to the counterpart contact interface that is mounted on the roof of the electric vehicle.

4 Symbols and abbreviated terms

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Addition:

| ACD | Automatic connection device |
5 Conventions

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Addition:

The original requirements are quoted in cursive letter and in color blue. Deviations or restrictions to original requirements are specified under a new modified requirement number. A new number is attached to the original number in a schema ["original number"_n]. For example: [V2G2-OC-000_1], where [V2G-000] is the original requirement number.

If any mandatory parameter specified by ISO/IEC DIS 15118-2 is not used for OppCharge communication, a default value is set, “0” for integer type, an empty string “” for string type. In case of other data types the default value is given at the value definition.

If the usage of an element in the message is specified as “don’t care”, it is not forbidden to send the information in this element, but this information may not be used by the receiver and the sender cannot expect the receiver to act on the sent information. It is comparable to an optional element, but to state out the difference to the standard “don’t care” is used instead and can also be applied to elements that are mandatory in ISO/IEC DIS 15118-2 (2012).

6 Document overview

This clause of ISO/IEC DIS 15118-2 is applicable.
7 Basic requirements for V2G communication

7.1 General information
This clause of ISO/IEC DIS 15118-2 is applicable.

7.2 Service primitive concept of OSI layered architecture
This clause of ISO/IEC DIS 15118-2 is applicable.

7.3 Security concept
This clause of ISO/IEC DIS 15118-2 is NOT applicable.

Restriction:
In 1st version of OppCharge communication standard TLS, certificate based authentication and contracts are not supported.
Communication takes place via WLAN. The WLAN connection is secured by WPA2.

7.4 V2G communication states
This clause of ISO/IEC DIS 15118-2 is applicable.

7.5 Data link layer
This clause of ISO/IEC DIS 15118-2 is not applicable. Instead of wired communication OppCharge wireless communication is compliant to IEEE/Std 802.11™-2012

7.6 Network layer
This clause of ISO/IEC DIS 15118-2 is applicable.

7.7 Transport layer
This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Restriction:
Subclause 7.7.3 and its subclauses are not applicable.

7.8 V2G transfer protocol
This clause of ISO/IEC DIS 15118-2 is applicable.

7.9 Presentation layer
This clause of ISO/IEC DIS 15118-2 is applicable.

7.10 Application layer
This clause of ISO/IEC DIS 15118-2 is applicable.
Chapter 8: Application layer messages

8.1 General information and definitions

This clause of ISO/IEC DIS 15118-2 is applicable.

8.2 Protocol handshake definition

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-166] The EVCC shall initiate the handshake sending a supportedAppProtocolReq message as depicted in Figure 16 to the SECC. This request message provides a list of charging protocols supported by the EVCC.

Addition:

[V2G2-OC-166_1] The EVCC shall initiate the handshake sending a supportedAppProtocolReq message only if following conditions are fulfilled:
- WLAN signal strength is not below -75 dBm

Original requirement:

[V2G2-167] Each entry in the list of supported EVCC protocols shall include the ProtocolNamespace, the VersionNumberMajor and VersionNumberMinor, the unique SchemaID dynamically assigned by the EVCC and the priority of the protocol entry. The priority in the EVCC request message enables the EVCC to announce the preferred application layer protocol where Priority equal to 1 indicates the highest priority and priority equal to 20 indicates the lowest priority. The number of protocols included in the request message is limited to 20.

Restriction:

[V2G2-OC-167_1] In context of the OppCharge communication V 1.2.0 only one valid entry is allowed as defined in Table 22_1.

Original requirement:

[V2G2-170] The SECC shall confirm (positively respond) an EVCC supported protocol even if the values of the VersionNumberMinor in EVCC request message does not match with the VersionNumberMinor of an SECC supported protocol where the VersionNumberMajor matches.

Deviation:

[V2G2-OC-170_1] VersionNumberMajor and VersionNumberMinor together with ProtocolNameSpace are used by SECC to match the protocol that is supported by both EVCC and SECC. SECC will send FAILED_NoNegotiation in case one of the criteria does not match. Refer to in Table 22_2.

Original requirement:

[V2G2-172] Usually it is expected that the SECC is able to support the relevant application layer protocols indicated by the EVCC. However when none of
the application layer protocols included in the list received from the EVCC is supported by the SECC, the ResponseCode in the response message shall be equal to Failed_NoNegotiation indicating that the protocol negotiation was not successful. In this error scenario the response message shall not include a SchemaID.

Addition:

Although a matching protocol version is found, ResponseCode Failed_NoNegotiation shall also be used, if SECC is not ready due to technical reasons. SECC shall set ResponseCode to Failed_NoNegotiation, in case of
- Persistent isolation fault
- Positioning sensor error (EV not in position)
- E-Stop active
- Wind speed limit exceeded
- the charging station is in fatal error mode

Table 22.1 and table 22.2 specify the usage of supportedAppProtocol in OppCharge. Refer to the original table 22 for semantics and type definition.

Table 22.1 — Usage of message elements supportedAppProtocolReq

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProtocolNamespace</td>
<td>&quot;urn:iso:15118:2:2010:MsgDef&quot;</td>
</tr>
<tr>
<td>VersionNumberMajor</td>
<td>1</td>
</tr>
<tr>
<td>VersionNumberMinor</td>
<td>0</td>
</tr>
<tr>
<td>SchemaID</td>
<td>0</td>
</tr>
<tr>
<td>Priority</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

Table 22.2 — Usage of message elements supportedAppProtocolRes

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SchemaID</td>
<td>Same as received from EV</td>
</tr>
</tbody>
</table>
| ResponseCode       | Used ResponseCode:
|                    | - OK_SuccessfulNegotiation
|                    | - Failed_NoNegotiation, if protocol mismatch or any HPC failure occurs; refer to [V2G2-OC-172_1] |

New requirements:

In case of an active charging session SECC shall not accept new sessions.

SECC shall answer to a SupportedAppProtocol request with supportedAppProtocol response with “ResponseCode = FAILED_NoNegotiation”.

[V2G2-OC-172_1] Although a matching protocol version is found, ResponseCode Failed_NoNegotiation shall also be used, if SECC is not ready due to technical reasons. SECC shall set ResponseCode to Failed_NoNegotiation, in case of
- Persistent isolation fault
- Positioning sensor error (EV not in position)
- E-Stop active
- Wind speed limit exceeded
- the charging station is in fatal error mode

Table 22.1 and table 22.2 specify the usage of supportedAppProtocol in OppCharge. Refer to the original table 22 for semantics and type definition.

Table 22.1 — Usage of message elements supportedAppProtocolReq

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProtocolNamespace</td>
<td>&quot;urn:iso:15118:2:2010:MsgDef&quot;</td>
</tr>
<tr>
<td>VersionNumberMajor</td>
<td>1</td>
</tr>
<tr>
<td>VersionNumberMinor</td>
<td>0</td>
</tr>
<tr>
<td>SchemaID</td>
<td>0</td>
</tr>
<tr>
<td>Priority</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

Table 22.2 — Usage of message elements supportedAppProtocolRes

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SchemaID</td>
<td>Same as received from EV</td>
</tr>
</tbody>
</table>
| ResponseCode       | Used ResponseCode:
|                    | - OK_SuccessfulNegotiation
|                    | - Failed_NoNegotiation, if protocol mismatch or any HPC failure occurs; refer to [V2G2-OC-172_1] |

New requirements:

In case of an active charging session SECC shall not accept new sessions.

SECC shall answer to a SupportedAppProtocol request with supportedAppProtocol response with “ResponseCode = FAILED_NoNegotiation”.

[V2G2-OC-725] In case of an active charging session SECC shall not accept new sessions.

SECC shall answer to a SupportedAppProtocol request with supportedAppProtocol response with “ResponseCode = FAILED_NoNegotiation”.

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8.3 V2G message definition

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4 BodyElement Definitions

8.4.1 Common messages

8.4.1.1 Overview

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.2 Session Setup

8.4.1.2.1 General

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.2.2 Session Setup Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-189] The message elements of this message shall be used as defined in Table 26.

Deviation:

[V2G2-OC-189_1] Instead of MAC address, EVCCID is a string of length 8, starting with 2 letters representing the vehicle vendor, followed by 6 digits for enumeration of the specific vehicle. Refer to Table 26_1.

NOTE: Format if the EVCCID is “VVnnnnnn”, where the two characters VV stand for the vendor and “nnnnnn” is the specific vehicle number of the operator.

Table 26_1 specifies the usage of SessionSetupReq in OppCharge. Refer to the original Table 26 for semantics and type definition.

Table 26_1 — Usage of message elements SessionSetupReq

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVCCID</td>
<td>8 ASCII characters, starting with 2 letters followed by 6 digits.</td>
</tr>
</tbody>
</table>

8.4.1.2.3 Session Setup Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comments:

- Following response codes are used by SECC:
OK and OK_NewSessionEstablished if a new session is established successfully.

- FAILED_SequenceError if a message is received other than sessionSetupReq.

- FAILED if any internal error occurs.

- ResponseCode OK_OldSessionJoined and FAILED_SignatureError are not used. Refer to [V2G2-OC-461_1], [V2G2-OC-463_1] in subclause 8.8.3

Table 27_1 specifies the usage of SessionSetupRes in OppCharge. Refer to the original Table 27 for semantics and type definition.

**Table 27_1 — Usage of message elements SessionSetupRes**

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK</td>
</tr>
<tr>
<td></td>
<td>- OK_NewSessionEstablished</td>
</tr>
<tr>
<td></td>
<td>- FAILED</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError</td>
</tr>
<tr>
<td>EVSEID</td>
<td>up to 32 ASCII characters, no predefined format</td>
</tr>
<tr>
<td>DateTimeNow</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

8.4.1.3 Service Discovery

8.4.1.3.1 Service Discovery handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.3.2 Service Discovery Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-194] The message elements of this message shall be used as defined in Table 28.

Restrictions:

[V2G2-OC-194_1] The message elements of ServiceDiscoveryReq are not used by both EVCC and SECC, refer to Table 28_1.

Table 28_1 specifies the usage of ServiceDiscoveryReq in OppCharge. Refer to the original Table 28 for semantics and type definition.

**Table 28_1 — Usage of message elements ServiceDiscoveryReq**

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceScope</td>
<td>Don’t care</td>
</tr>
<tr>
<td>ServiceCategory</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>
8.4.1.3.3 ServiceDiscoveryRes

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comments:

- Following response codes are used by SECC:
  - OK if ServiceDiscoveryReq is successfully processed.
  - FAILED_SequenceError if a message is received other than ServiceDiscoveryReq.
  - SessionStopReq is accepted to go to session stop handling.
  - FAILED_UnknownSession if SessionID differs from the currently used one.
  - FAILED if any internal errors occur.

- ResponseCode FAILED_SignatureError is not used. Refer to [V2G2-OC-461_1] in subclause 8.8.3.

- EVCC accepts only PaymentOption = ExternalPayment. Otherwise, it will end charging session by termination of the session and send SessionStopReq. Refer to [V2G2-OC-283_1] in subclause 8.5.2.9.

- SECC sets only one entry in payment option list, paymentOption = ExternalPayment. Refer to [V2G2-OC-283_1] in subclause 8.5.2.9.

Table 29_1 specifies the usage of ServiceDiscoveryRes in OppCharge. Refer to the original Table 29 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK</td>
</tr>
<tr>
<td></td>
<td>- FAILED</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError</td>
</tr>
<tr>
<td></td>
<td>- FAILED_UnknownSession</td>
</tr>
<tr>
<td>PaymentOption</td>
<td>ExternalPayment. Refer to [V2G2-OC-283_1] in subclause 8.5.2.9</td>
</tr>
<tr>
<td>ChargeService</td>
<td>Refer to [V2G-OC-270_1] in subclause 8.5.2.3, [V2G-OC-272_1] in subclause 8.5.2.4</td>
</tr>
<tr>
<td>ServiceList</td>
<td>Don’t care. Refer to subclause 8.5.2.2</td>
</tr>
</tbody>
</table>

8.4.1.4 Service Detail

This clause of ISO/IEC DIS 15118-2 is not applicable.

8.4.1.5 Service and Payment Selection

8.4.1.5.1 Service and Payment Selection Handling

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:
Based on the provided services and the corresponding payment options by the SECC this message pair allows the transmission of the selected PaymentOption, SelectedServices and related ParameterSets. Depending on the selected payment additional messages (PaymentDetails message pair) are exchanged.

NOTE:
The feature of Service and Payment Selection is not used. The ServicePaymentSelectionReq/Res messages are passed through without any functions.

8.4.1.5.2 Service and Payment Selection Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-202] The message elements of this message shall be used as defined in Table 32.

Restriction:

[V2G2-OC-202_1] The parameters are not used, refer to Table 32_1.

Table 32_1 specifies the usage of ServicePaymentSelectionReq for OppCharge. Refer to the original Table 32 for semantics and type definition.

Table 32_1 — Usage of message elements ServicePaymentSelectionReq

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SelectedPaymentOption</td>
<td>Don’t care (default value ExternalPayment )</td>
</tr>
<tr>
<td>SelectedServiceList</td>
<td>Refer to subclause 8.5.2.24</td>
</tr>
</tbody>
</table>

8.4.1.5.3 Service and Payment Selection Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comments:

- Following response codes are used by SECC:
  - OK if ServicePaymentSelectionReq is successfully processed.
  - FAILED_SequenceError if a message is received other than ServicePaymentSelectionReq. SessionStopReq is accepted to go to session stop handling.
  - FAILED_UnknownSession if SessionID differs from the currently used one.
  - FAILED if any internal errors occur.

- FAILED_SignatureError, FAILED_PaymentSelectionInvalid and FAILED_ServiceSelectionInvalid are not used. Refer to [V2G2-OC-461_1] [V2G2-OC-465_1] [V2G2-OC-467_1] in subclause 8.8.3
8.4.1.6 Payment Details

This clause of ISO/IEC DIS 15118-2 is not applicable.

8.4.1.7 Contract Authentication

8.4.1.7.1 Contract Authentication Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comment:

The Contract Authentication request/response are passed through without loop sequence.

Original requirement:

[V2G2-211] The message elements of this message shall be used as defined in Table 36.

Restriction:

[V2G2-OC-211_1] The parameters are not used for OppCharge, refer to Table 36_1.

Table 36_1 specifies the usage of ContractAuthenticationReq for OppCharge. Refer to the original Table 36 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>Don't care</td>
</tr>
<tr>
<td>GenChallenge</td>
<td>Don't care</td>
</tr>
</tbody>
</table>

8.4.1.7.2 Contract Authentication Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-213] The message elements of this message shall be used as defined in Table 37.

Restrictions:

[V2G2-OC-213_1] EVSEProcessing is not used for OppCharge, refer to Table 37_1.

Comments:

- Following response codes are used by SECC:
  - OK if ContractAuthenticationReq is successfully processed.
  - FAILED_SequenceError if a message is received other than ContractAuthenticationReq. SessionStopReq is accepted to go to session stop handling.
- FAILED UnknownSession if SessionID differs from the currently used one.
- FAILED if any internal errors occur.
- FAILED_SignatureError and FAILED_CertificateExpired are not used. Refer to [V2G2-OC-461_1] [V2G2-OC-475_1] in subclause 8.8.3

Table 37_1 specifies the usage of ContractAuthenticationRes in OppCharge. Refer to the original Table 37 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVSEProcessing</td>
<td>Don’t care (default Finished)</td>
</tr>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK</td>
</tr>
<tr>
<td></td>
<td>- FAILED</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError</td>
</tr>
<tr>
<td></td>
<td>- FAILED_UnknownSession</td>
</tr>
</tbody>
</table>

Table 37_1 — Usage of message elements ContractAuthenticationRes

8.4.1.8 Charge Parameter Discovery

8.4.1.8.1 Charge Parameter Discovery Handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.8.2 Charge Parameter Discovery Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-217] The EVCC shall use the EVRequestedEnergyTransferType as defined in Table 39.

Restrictions:

[V2G2-OC-217_1] The EVCC shall only use DC_extended for EVRequestedEnergyTransferType as defined in Table 39.

Table 38_1 specifies the usage of ChargeParameterDiscoveryReq in OppCharge. Refer to the original Table 38 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVRequestedEnergyTransferType</td>
<td>DC_extended</td>
</tr>
<tr>
<td>AC_EVChargeParameter</td>
<td>Not applied for OppCharge</td>
</tr>
<tr>
<td>DC_EVChargeParameter</td>
<td>Refer to subclause 8.5.4.3</td>
</tr>
</tbody>
</table>
8.4.1.8.3 Charge Parameter Discovery Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-220] The message elements of this message shall be used as defined in Table 40.

Restrictions:

[V2G2-OC-220_1] EVSEProcessing and SAScheduleList are not used for OppCharge, refer to Table 40_1.

Comments:

- Following response codes are used by SECC:
  - OK if ChargeParameterDiscoveryReq is successfully processed.
  - FAILED_SequenceError if a message is received other than ChargeParameterDiscoveryReq, SessonStopReq is accepted to go to session stop handling.
  - FAILED_UnknownSession if SessionID differs from the currently used one.
  - FAILED_WrongChargeParameter if received EVRequestedEnergyTransferType is other than DC_extended.
  - FAILED if any internal errors occur.
  - FAILED_SignatureError and FAILED_WrongEnergyTransferType are not used, refer to [V2G2-OC-461_1] [V2G2-OC-476_1] in subclause 8.8.3.
  - DC_EVSEStatus contained in DC_EVSEChargeParameter is not used, refer to subclause 8.5.4.1.

Table 40_1 specifies the usage of ChargeParameterDiscoveryRes in OppCharge. Refer to the original Table 40 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVSEProcessing</td>
<td>Don’t care. (default Finished)</td>
</tr>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK</td>
</tr>
<tr>
<td></td>
<td>- FAILED</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError</td>
</tr>
<tr>
<td></td>
<td>- FAILED_UnknownSession</td>
</tr>
<tr>
<td></td>
<td>- FAILED_WrongChargeParameter</td>
</tr>
<tr>
<td>SAScheduleList</td>
<td>Don’t care. Refer to subclause 8.5.2.12</td>
</tr>
<tr>
<td>AC_EVSEChargeParameter</td>
<td>Not applied for OppCharge</td>
</tr>
<tr>
<td>DC_EVSEChargeParameter</td>
<td>Refer to subclause 8.5.4.4</td>
</tr>
</tbody>
</table>

NOTE: Reneogotation is not supported.
8.4.1.9 Power Delivery

8.4.1.9.1 Power Delivery Handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.9.2 Power Delivery Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-222] The message elements of this message shall be used as defined in Table 41.

Restrictions:

[V2G2-OC-222_1] ReadyToChargeState parameter is used to request EVSE to start or stop charging process, refer to Table 41_1

Table 41_1 specifies the usage of PowerDeliveryReq in OppCharge. Refer to the original Table 41 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReadyToChargeState</td>
<td>true to start charging</td>
</tr>
<tr>
<td></td>
<td>false to stop charging</td>
</tr>
<tr>
<td>ChargingProfile</td>
<td>Don’t care. Refer to subclause 8.5.2.10</td>
</tr>
<tr>
<td>DC_EVPowerDeliveryParameter</td>
<td>Don’t care. Refer to subclause 8.5.4.5</td>
</tr>
</tbody>
</table>

8.4.1.9.3 Power Delivery Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comments:

- Following response codes are used by SECC:
  
  - OK if PowerDeliveryReq is successfully processed.
  
  - FAILED_SequenceError if a message is received other than PowerDeliveryReq. SessionStopReq is accepted to go to session stop handling.
  
  - FAILED_UnknownSession if SessionID differs from the currently used one.
  
  - FAILED if any internal errors occur.

- FAILED_SignatureError, FAILED_ChargingProfileInvalid, FAILED_TariffSelectionInvalid and FAILED_PowerDeliveryNotApplied are not used, refer to [V2G2-OC-461_1] [V2G2-OC-478_1] [V2G2-OC-479_1] [V2G2-OC-480_1] in subclause 8.8.3
Table 42.1 specifies the usage of PowerDeliveryRes in OppCharge. Refer to the original Table 42 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK.</td>
</tr>
<tr>
<td></td>
<td>- FAILED</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError</td>
</tr>
<tr>
<td></td>
<td>- FAILED_UnknownSession</td>
</tr>
<tr>
<td>DC_EVSEStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.1</td>
</tr>
</tbody>
</table>

8.4.1.10 Certificate Update

This clause of ISO/IEC DIS 15118-2 is not applicable. Not used in OppCharge V 1.2.0.

8.4.1.11 Certificate Installation

This clause of ISO/IEC DIS 15118-2 is not applicable. Not used in OppCharge V 1.2.0.

8.4.1.12 Session Stop

8.4.1.12.1 SessionStopReq/Res handling

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original statement:

This V2G message pair shall be used for terminating a V2G communication session initiated by preceding SessionSetupReq message.

Addition:

Due to the nature of ACD charging, after termination of the charging process the pantograph has to be raised up at first. The electric vehicle shall be kept immobilized until the pantograph is in the upper home position. As long as the pantograph is not in the upper home position, the EVCC shall continuously send SessionStopReq and the SECC shall respond with response code FAILED. If the pantograph is in the upper home position, SECC shall send SessionStopRes with response code OK.

SessionStopReq can be sent at any communication state by EVCC to request termination of charging process. The response code FAILED_SequenceError is not applicable in this case.

The minimum time interval between two SessionStopReq messages shall be larger than 100 ms in order to limit the message load on the system.

8.4.1.12.2 Session Stop Request

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.1.12.3 Session Stop Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:
Deviations:

- Following SECC response codes are used:
  
  - **OK** if SessionStopReq is successfully processed and the pantograph is in upper home position.
  
  - **FAILED** if the pantograph is not in the upper home position or any internal errors occurs. Refer to [V2G2-OC-572_1] in subclause 8.8.4.3.1.

- In the case of “ResponseCode = FAILED” EVCC shall not terminate the session but continue to send SessionStopReq. Refer to [V2G2-OC-507_1] in subclause 8.8.4.2.1.

- In any error situation whether caused by an interrupted v2g communication or a hardware defect the ACD status is unknown to the EVCC. The EV cannot be released the regular way. The driver has to double check that the ACD is properly disconnected and the EV can safely leave the charge point. In that case the driver can abort the immobilization caused by the EVCC by using OEM specific means. Refer to [V2G2-OC-507_2] in subclause 8.8.4.2.1.

Table 47_1 specifies the usage of SessionStopRes in OppCharge. Refer to the original Table 47 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK, if the pantograph is in the upper home position then the vehicle can be released safely.</td>
</tr>
<tr>
<td></td>
<td>- FAILED, if the pantograph is not in the upper home position.</td>
</tr>
</tbody>
</table>

8.4.2 AC-Messages

This clause of ISO/IEC DIS 15118-2 is not applicable.

8.4.3 DC-Messages

8.4.3.1 Overview

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.3.2 Cable Check

8.4.3.2.1 Cable Check Handling

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original statement:

For a safe DC charging a cable check must be performed.

Addition:

For plug in charging the EVSE is connected by wire to the EV all the time from the beginning of the charge procedure until the end. In contrast to plug in charging the ACD/pantograph is not
connected at this point of the procedure. Thus the EVSE is not yet connected to the EV electrically.

As a precondition for cable check the ACD/pantograph has to be connected to the EV’s charging interface first. Because of the lack of a corresponding message pair for the connection process in the underlying version of the ISO standard, the cable check message pair is used to integrate this process step into the sequences.

The 1st CableCheckReq message induces the EVSE to move down the pantograph. CableCheckReq/Res are repeated until the pantograph is connected to the EV’s charging interface and the CP status changes from A to B. After that the regular cable check sequence continues.

8.4.3.2.2 Cable Check Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original statement:

The cable check request asks for the cable check status of the EVSE and e.g. tells the EVSE if the connector is locked on EV side and if the EV is ready to charge.

Deviation:

At first the pantograph will be activated in order to connect the EVSE with the electrical circuits of the vehicle. As a precondition for this the vehicle needs to be positioned within the ACD contact area tolerances correctly. The CableCheck message is repeated as long as the pantograph is moving, contacting and while the insulation test is executed.

Original requirement:

[V2G2-250] The message elements of this message shall be used as defined in Table 51.

Restrictions:

[V2G2-OC-250_1] The DC_EVStatus may not be handled by EVSE, as defined Table 51_1.

Table 51_1 specifies the usage of CableCheckReq in OppCharge. Refer to the original Table 51 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC_EVStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.2</td>
</tr>
</tbody>
</table>

8.4.3.2.3 Cable Check Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:
Comments:

- **EVSEProcessing** variable is used to indicate whether the cable check has completed. EVSEProcessing is set to "Finished", if the pantograph is connected and the isolation test has finished. Otherwise EVSEProcessing is set to "Ongoing". Refer to Table 52_1.

- Following response codes are used by SECC:
  - **OK** if CableCheckReq is successfully processed.
  - **FAILED_SequenceError** if a message is received other than CableCheckReq, or charge control is in a wrong state. SessionStopReq is accepted to go to session stop handling.
  - **FAILED_UnknownSession** if SessionID differs from the currently used one.
  - **FAILED** if any internal errors occur.

- **FAILED_SignatureError** is not used, refer to [V2G2-OC-461_1] in subclause 8.8.3.

- **EVSEStatusCode**, contained in DC_EVSEStatusType (subclause 8.5.4.1), is used to indicate the state of the isolation test. In context of ACD DC_EVSEStatusCode is set to Reserved_8 to indicate the moving state until the pantograph is connected to the EV’s charging interface. Status code EVSE_IsolationMonitoringActive indicates the processing of the the isolation monitor, refer to [V2G2-OC-365_1] defined in subclause 8.5.4.1.

- **EVSEIsolationStatus** is used to indicate status of the isolation test. It is always set to Invalid before the isolation test is finished, refer to [V2G2-OC-365_1] defined in subclause 8.5.4.1.

- SECC shall carry out following steps as also shown in Figure OC_1:

New requirements:

[V2G2-OC-701] After receiving the first CableCheckReq, the SECC shall start activation of the pantograph and respond with CableCheckRes containing "ResponseCode = OK" and EVSEStatusCode = Reserved_8 and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing within V2G_SECC_Msg_Performance_Time according to Table 103_1.

[V2G2-OC-702] If the activation of the pantograph fails, the SECC shall respond with CableCheckRes containing "ResponseCode = FAILED" and EVSEStatusCode = EVSE_NotReady and EVSEIsolationStatus = Invalid and EVSEProcessing = Finished. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-703] While waiting for the pantograph moving down to the end position, the SECC shall respond with CableCheckRes containing "ResponseCode = OK" and EVSEStatusCode = Reserved_8 and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing within V2G_SECC_Msg_Performance_Time according to Table 103_1.

[V2G2-OC-704] If the pantograph has not reached the end position within V2G_SECC_ACD_Connection_Timeout according to Table OC_1, the
SECC shall respond with CableCheckRes containing “ResponseCode = FAILED” and EVSEStatusCode = EVSE_NotReady and EVSEIsolationStatus = Invalid and EVSEProcessing = Finished and the SECC commands the pantograph to its home position. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-705] If the pantograph has reached the end position and the SECC has measured CP state B with a related CP voltage to be smaller than 10.5 V and larger or equal than 7.5 V, the SECC shall respond with CableCheckRes containing “ResponseCode = OK” and EVSEStatusCode = EVSE_IsolationMonitoringActive and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing within V2G_SECC_Msg_Performance_Time according to Table 103_1.

NOTE
In case EVCC reacts very fast on state B and changes control pilot to state C within a very short time, it is possible that the SECC does not detect state B but state C when it is waiting for state B. In the case the SECC detects a direct change from CP state A to C the timer for V2G_SECC_ACD_Endpostion_to_B_Timeout is not relevant anymore and therefore reset.

[V2G2-OC-706] If the pantograph has reached the end position and the SECC has not measured CP state B, C or D within V2G_SECC_ACD_Endpostion_to_B_Timeout according to Table OC_1, the SECC shall respond with CableCheckRes containing “ResponseCode = FAILED” and EVSEStatusCode = EVSE_NotReady and EVSEIsolationStatus = Invalid and EVSEProcessing = Finished and the SECC commands the pantograph to its home position. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-707] If the SECC has measured CP state to be C or D with a related CP voltage to be smaller than 7.5 V and larger or equal than 2 V within V2G_SECC_CP_Transition_B_to_C_Timeout according to Table OC_1, the SECC shall activate the DC-breaker, and respond with CableCheckRes containing “ResponseCode = OK” and EVSEStatusCode = EVSE_IsolationMonitoringActive and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing within V2G_SECC_Msg_Performance_Time according to Table 103_1.

[V2G2-OC-708] If the pantograph has reached the end position and CP state B is active but the SECC has not measured CP state to be C or D with a related CP voltage to be smaller than 7.5 V and larger or equal than 2 V within V2G_SECC_CP_Transition_B_to_C_Timeout according to Table OC_1, the SECC shall respond with CableCheckRes containing “ResponseCode = FAILED” and EVSEStatusCode = EVSE_NotReady and
EVSEIsolationStatus = Invalid and with EVSEProcessing = Finished and the SECC commands the pantograph to its home position. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-710] If DC-breaker closed within V2G_SECC_Breaker_Activation_Timeout according to Table OC_1, the SECC shall start the insulation monitoring and respond with CableCheckRes containing “ResponseCode = OK” and EVSEStatusCode = EVSE_IsolationMonitoringActive and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-711] If DC-breaker does not close within V2G_SECC_Breaker_Activation_Timeout according to Table OC_1, the SECC shall respond with CableCheckRes containing “ResponseCode = FAILED” and EVSEStatusCode = EVSE_NotReady and EVSEIsolationStatus = Invalid and with EVSEProcessing = Finished. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-712] While the isolation test is processing the EVSE shall respond with CableCheckRes containing “ResponseCode = OK” and EVSEStatusCode = EVSE_IsolationMonitoringActive and EVSEIsolationStatus = Invalid and EVSEProcessing = Ongoing within V2G_SECC_Msg_Performance_Time according to Table 103_1.

[V2G2-OC-713] If the insulation monitor indicates an insulation error after V2G_SECC_Isolation_Monitoring_Time according to Table OC_1, the SECC shall respond with CableCheckRes containing “ResponseCode = FAILED” and EVSEStatusCode = EVSE_NotReady and EVSEIsolationStatus = Fault (or Invalid) and with EVSEProcessing = Finished. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-714] As soon as the isolation test has been finished successfully the SECC shall respond with CableCheckRes containing “ResponseCode = OK” and EVSEStatusCode = EVSE_Ready and EVSEIsolationStatus = Valid and EVSEProcessing = Finished. The allowed next request shall be PreChargeReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.
Figure OC_1  SECC cable check handling
Table OC_1 — timeout value of Cable Check handling

<table>
<thead>
<tr>
<th>Name</th>
<th>Value [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2G_SECC_ACD_Connection_Timeout</td>
<td>20</td>
</tr>
<tr>
<td>V2G_SECC_ACD_Disconnection_Timeout</td>
<td>20</td>
</tr>
<tr>
<td>V2G_SECC_ACD_Endposition_to_B_Timeout</td>
<td>2</td>
</tr>
<tr>
<td>V2G_SECC_CP_Transition_B_to_C_Timeout</td>
<td>2</td>
</tr>
<tr>
<td>V2G_SECC_Breaker_Activation_Timeout</td>
<td>1</td>
</tr>
<tr>
<td>V2G_SECC_Isolation_Monitoring_Time</td>
<td>10</td>
</tr>
</tbody>
</table>

NOTE: V2G_SECC_ACD_Endposition_to_B_Timeout serves for the debouncing of the CP signal during the contacting process.

Table 52_1 specifies the usage of CableCheckRes in OppCharge. Refer to the original Table 52 for semantics and type definition.

Table 52_1 — Usage of message elements CableCheckRes

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVSEProcessing</td>
<td>Indicates if the connection and cable check process is finished.</td>
</tr>
<tr>
<td></td>
<td>- Finished, if the pantograph is in end position and the isolation test is completed successfully,</td>
</tr>
<tr>
<td></td>
<td>- Ongoing, if pantograph is moving or isolation test is not yet finished</td>
</tr>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode:</td>
</tr>
<tr>
<td></td>
<td>- OK,</td>
</tr>
<tr>
<td></td>
<td>- FAILED,</td>
</tr>
<tr>
<td></td>
<td>- FAILED_SequenceError,</td>
</tr>
<tr>
<td></td>
<td>- FAILED UnknownSession</td>
</tr>
<tr>
<td>DC_EVSEStatus</td>
<td>refer to subclause 8.5.4.1</td>
</tr>
</tbody>
</table>

8.4.3.3 Pre Charge

8.4.3.3.1 Pre Charge Handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.3.3.2 Pre Charge Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-254] The message elements of this message shall be used as defined in Table 53.

Restriction:

[V2G2-OC-254_1] DC_EVSEStatus may not be handled by EVSE, refer to Table 53_1.

Table 53_1 specifies the usage of PreChargeReq in OppCharge. Refer to the original Table 53 for semantics and type definition.
Table 53_1 — Usage of message elements PreChargeReq

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC_EVStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.2</td>
</tr>
<tr>
<td>EVTTargetVoltage</td>
<td>Target Voltage requested by EV.</td>
</tr>
<tr>
<td>EVTTargetCurrent</td>
<td>Current demanded by EV set to 0, but don’t care. Note: the EVSE has to command the appropriate current to the AC/DC converter in order to support the preCharge function at the least possible current level. (OEM specific)</td>
</tr>
</tbody>
</table>

8.4.3.3.3 Pre Charge Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-256] The message elements of this message shall be used as defined in Table 54.

Restriction:

[V2G2-OC-256_1] DC_EVSEStatus may not be handled by EVSE, refer to Table 54_1.

Comments:

- Following response codes are used by SECC:
  - OK if PreChargeReq is successfully processed.
  - FAILED_SequenceError if a message is received other than PreChargeReq or charge control is in a wrong state. SessionStopReq is accepted to go to session stop handling.
  - FAILED_UnknownSession if SessionID differs from the currently used one.
  - FAILED if any internal errors occur.

- FAILED_SignatureError is not used, refer to [V2G2-OC-461_1] in subclause 8.8.3.

Table 54_1 specifies the usage of PreChargeRes in OppCharge. Refer to the original Table 54 for semantics and type definition.

Table 54_1 — Usage of message elements PreChargeRes

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
</table>
| ResponseCode           | Used ResponseCode:  
|                        | - OK, 
|                        | - FAILED, 
|                        | - FAILED_SequenceError, 
|                        | - FAILED_UnknownSession                                             |
| DC_EVSEStatus          | Don’t care. Refer to subclause 8.5.4.1                               |
| EVSEPresentVoltage     | Present voltage of EVSE. (present EVSE output voltage)               |
8.4.3.4 Current Demand

8.4.3.4.1 Current Demand Handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.4.3.4.2 Current Demand Request

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Comment:

Parameter EVRESSSOC, contained in DC_EVStatus is used to communicate the available SOC to the SECC which is a fraction of the physical battery SOC and is defined by vehicle OEM. Refer to subclause 8.5.4.2. Table 55_1 specifies the usage of CurrentDemandReq in OppCharge. Refer to the original Table 55 for semantics and type definition.

<table>
<thead>
<tr>
<th>Table 55_1 — Usage of message elements CurrentDemandReq</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element Name</strong></td>
</tr>
<tr>
<td>DC_EVStatus</td>
</tr>
<tr>
<td>EVTTargetCurrent</td>
</tr>
<tr>
<td>EVMaximumVoltageLimit</td>
</tr>
<tr>
<td>EVMaximumCurrentLimit</td>
</tr>
<tr>
<td>EVMaximumPowerLimit</td>
</tr>
<tr>
<td>BulkChargingComplete</td>
</tr>
<tr>
<td>ChargingComplete</td>
</tr>
<tr>
<td>RemainingTimeToFullSoc</td>
</tr>
<tr>
<td>RemainingTimeToBulkSoC</td>
</tr>
<tr>
<td>EVTTargetVoltage</td>
</tr>
</tbody>
</table>

NOTE: EVMaximumPowerLimit is not necessarily the product of EVMaximumVoltageLimit and EVMaximumCurrentLimit. It is the actual power limit that can be handled by the EV’s RESS and wiring infrastructure.

8.4.3.4.3 Current Demand Response

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-260] The message elements of this message shall be used as defined in Table 56.

Restriction:

[V2G2-OC-260_1] The message elements of this message shall be used as defined in Table 56_1. DC_EVSEStatus is not used.
Comments:

- Following response codes are used by SECC:
  
  o OK if CurrentDemandReq is successfully processed.
  
  o FAILED_SequenceError if a message is received other than CurrentDemandReq, PowerDeliveryReq or charge control is in a wrong state. SessonStopReq is accepted to go to session stop handling.
  
  o FAILED_UnknownSession if SessionID differs from the currently used one.
  
  o FAILED if any internal errors occur.

- FAILED_SignatureError is not used, refer to [V2G2-OC-461_1] in subclause 8.8.3.

Table 56_1 specifies the usage of CurrentDemandRes in OppCharge. Refer to the original Table 56 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ResponseCode</td>
<td>Used ResponseCode: - OK, - FAILED, - FAILED_SequenceError, - FAILED_UnknownSession</td>
</tr>
<tr>
<td>DC_EVSEStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.2</td>
</tr>
<tr>
<td>EVSEPressentVoltage</td>
<td>Present output voltage of the EVSE</td>
</tr>
<tr>
<td>EVSEPressentCurrent</td>
<td>Present out current of EVSE</td>
</tr>
<tr>
<td>EVSECurentLimitAchieved</td>
<td>If set to TRUE, the EVSE has reached its current limit</td>
</tr>
<tr>
<td>EVSEVoltageLimitAchieved</td>
<td>If set to TRUE, the EVSE has reached its voltage limit</td>
</tr>
<tr>
<td>EVSEPowerLimitAchieved</td>
<td>If set to TRUE, the EVSE has reached its power limit</td>
</tr>
<tr>
<td>EVSEMaximumVoltageLimit</td>
<td>Deviation to standard: Minimum of EVMaximumVoltageLimit and the maximum voltage the EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMaximumCurrentLimit</td>
<td>Deviation to standard: Minimum of EVMaximumCurrentLimit and the maximum current the EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMaximumPowerLimit</td>
<td>Maximum power the EVSE can deliver.</td>
</tr>
</tbody>
</table>

NOTE: The EVSE sends the minimum of EVMaximumVoltageLimit and the maximum voltage the EVSE can deliver. The value of EVMaximumVoltageLimit is sent as confirmation that the limit of the vehicle is accepted and can be provided by the station. Otherwise in case the station can only provide less voltage than the EVMaximumVoltageLimit, it sends the stations limit value. The same approach is applied to the MaximumCurrentLimit.
8.4.3.5 Welding Detection

This clause of ISO/IEC DIS 15118-2 is not used.

8.5 Complex data types

8.5.1 Overview

This clause of ISO/IEC DIS 15118-2 is applicable.

8.5.2 Common

8.5.2.1 ServiceTagType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-266] The message element shall be used as defined in Table 59.

Restriction:

[V2G2-OC-266_1] The message element shall be used as defined in Table 59_1.

Table 59_1 specifies the usage of ServiceTagType in OppCharge. Refer to the original Table 59 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceID</td>
<td>1, only DC_extended is supported</td>
</tr>
<tr>
<td>ServiceName</td>
<td>Optional, recommend to use “OPPCharge”</td>
</tr>
<tr>
<td>ServiceCategory</td>
<td>recommend to use “EVCharging”</td>
</tr>
<tr>
<td>ServiceScope</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

8.5.2.2 ServiceTagListType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-268] The message element shall be used as defined in Table 60.

Restriction:

[V2G2-OC-268_1] The message element shall be used as defined in Table 60_1.

Table 60_1 specifies the usage of ServiceTagListType in OppCharge, contained in ServiceDiscoveryRes, refer to subclause 8.4.1.3.3. Refer to the original Table 61 for semantics and type definition.
Table 60_1 — Usage of message element ServiceTagListType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Don't care. Refer to subclause 8.5.2.3</td>
</tr>
</tbody>
</table>

8.5.2.3 ServiceType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-270] The message element shall be used as defined in Table 61.

Restriction:

[V2G2-OC-270_1] The message element shall be used as defined in Table 61_1.

Table 61_1 specifies the usage of ServiceType for OppCharge, contained in ServiceDiscoveryRes (subclause 8.4.1.3.3). Refer to the original Table 61 for semantics and type definition.

Table 61_1 — Usage of message element ServiceType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceTag</td>
<td>Refer to subclause 8.5.2.1</td>
</tr>
<tr>
<td>FreeService</td>
<td>Don't care</td>
</tr>
</tbody>
</table>

8.5.2.4 ServiceChargeType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-272] The message element shall be used as defined in Table 62.

Restriction:

[V2G2-OC-272_1] The message elements shall be used as defined in Table 62_1.

Table 62_1 specifies the usage of ServiceChargeType for OppCharge, contained in ServiceDiscoveryRes (subclause 8.4.1.3.3). Refer to the original Table 62 for semantics and type definition.

Table 62_1 — Usage of message elements ServiceChargeType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnergyTransferType</td>
<td>only DC_extended</td>
</tr>
</tbody>
</table>
8.5.2.5 CertificateChainType

This clause of ISO/IEC DIS 15118-2 is not applicable. The messages PaymentDetailsReq, CertificateUpdateReq/Res and CertificateInstallationRes which contains CertificateChainType are not used in OppCharge V 1.2.0.

8.5.2.6 MeterInfoType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in ChargingStatusRes and MeteringReceiptReq which are not used in OppCharge V 1.2.0.

8.5.2.7 PhysicalValueType

This clause of ISO/IEC DIS 15118-2 is applicable.

8.5.2.8 Notification Type

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-281] The message element shall be used as defined in Table 67.

Restriction:

[V2G2-OC-281_1] The message element shall be used as defined in Table 67_1.

Table 67_1 specifies the usage of NotificationType for OppCharge, contained in the V2G message header. Refer to the original Table 67 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FaultCode</td>
<td>Don't care.</td>
</tr>
<tr>
<td>FaultMsg</td>
<td>Don't care.</td>
</tr>
</tbody>
</table>

8.5.2.9 PaymentOptionsType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-283] The message element shall be used as defined in Table 68.

Restriction:

[V2G2-OC-283_1] The list of payment options contains only one entry and only payment option type “ExternalPayment” is supported, option “Contract” is not used, refer to Table 68_1.

Table 68_1 specifies the usage of PaymentOptionsType in OppCharge, contained in ServiceDiscoveryRes (subclause 8.4.1.3.3). Refer to the original Table 68 for semantics and type definition.
Table 68.1 — Usage of message elements PaymentOptionsType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PaymentOption</td>
<td>ExternalPayment</td>
</tr>
</tbody>
</table>

8.5.2.10 ChargingProfileType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-606] The message element shall be used as defined in Table 69.

Restriction:

[V2G2-OC-606_1] The message element shall be used as defined in Table 69.1.

Table 69.1 specifies the usage of ChargingProfileType for OppCharge, contained in PowerDeliveryReq. Refer to the original Table 69 for semantics and type definition.

Table 69.1 — Usage of message elements ChargingProfileType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAScheduleTupleID</td>
<td>Don't care.</td>
</tr>
<tr>
<td>ProfileEntry</td>
<td>Don't care.</td>
</tr>
</tbody>
</table>

8.5.2.11 ProfileEntryType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-607] The message element shall be used as defined in Table 70.

Restriction:

[V2G2-OC-607_1] The message element shall be used as defined in Table 70.1.

Table 70.1 specifies the usage of ProfileEntryType for OppCharge, contained in ChargingProfileType in PowerDeliveryReq, refer to subclause 8.4.1.9.2. Refer to the original Table 70 for semantics and type definition.

Table 70.1 — Usage of message elements ProfileEntryType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ChargingProfileEntryStart</td>
<td>Don't care.</td>
</tr>
<tr>
<td>ChargingProfileEntryMaxPower</td>
<td>Don't care.</td>
</tr>
</tbody>
</table>

8.5.2.12 SAScheduleListType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:
Original requirement:

[V2G2-608] The message element shall be used as defined in Table 71.

Restriction:

[V2G2-OC-608_1] The message element shall be used as defined in Table 71_1.

Table 71_1 specifies the usage of SAScheduleListType for OppCharge, contained in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 71 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAScheduleTuple</td>
<td>Don’t care. Refer to subclause 8.5.2.13</td>
</tr>
</tbody>
</table>

8.5.2.13 SAScheduleTupleType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-609] The message element shall be used as defined in Table 72.

Restriction:

[V2G2-OC-609_1] The message element shall be used as defined in Table 72_1.

Table 72_1 specifies the usage of SAScheduleTupleType for OppCharge, contained in SAScheduleListType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 72 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAScheduleTupleID</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>PMaxSchedule</td>
<td>Don’t care. Refer to subclause 8.5.2.14</td>
</tr>
<tr>
<td>Sales Tariff</td>
<td>Don’t care. Refer to subclause 8.5.2.16</td>
</tr>
</tbody>
</table>

8.5.2.14 PMaxScheduleType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-610] The message element shall be used as defined in Table 73.

Restriction:

[V2G2-OC-610_1] The message element shall be used as defined in Table 73_1.
Table 73_1 specifies the usage of PMaxScheduleType for OppCharge, contained in SAScheduleTupleType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 73 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMaxScheduleID</td>
<td>Don't care.</td>
</tr>
<tr>
<td>PMaxScheduleEntry</td>
<td>Don't care. Refer to subclause 8.5.2.15</td>
</tr>
</tbody>
</table>

8.5.2.15 PMaxScheduleEntryType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-611] The message element shall be used as defined in Table 74.

Restriction:

[V2G2-OC-611_1] The message element shall be used as defined in Table 74_1.

Table 74_1 specifies the usage of PMaxScheduleEntryType for OppCharge, contained in SAScheduleTupleType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 74 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>RelativeTimeInterval</td>
<td>Don't care. Refer to subclause 8.5.2.18</td>
</tr>
<tr>
<td>PMax</td>
<td>Don't care.</td>
</tr>
</tbody>
</table>

8.5.2.16 SalesTariffType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-612] The message element shall be used as defined in Table 75.

Restriction:

[V2G2-OC-612_1] The message element shall be used as defined in Table 75_1.

Table 75_1 specifies the usage of SalesTariffType for OppCharge, contained in SAScheduleTupleType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 75 for semantics and type definition.
Table 75_1 — Usage of message elements SalesTariffType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SalesTariffID</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>SalesTariffDescription</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>NumEPriceLevels</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>SalesTariffEntry</td>
<td>Don’t care. Refer to subclause 8.5.2.17</td>
</tr>
</tbody>
</table>

8.5.2.17 SalesTariffEntryType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-613] The message element shall be used as defined in Table 76.

Restriction:

[V2G2-OC-613_1] The message element shall be used as defined in Table 76_1.

Table 76_1 specifies the usage of SalesTariffEntryType for OppCharge, contained in SAScheduleTupleType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 76 for semantics and type definition.

8.5.2.18 RelativeTimeIntervalType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-614] The message element shall be used as defined in Table 77.

Restriction:

[V2G2-OC-614_1] The message element shall be used as defined in Table 77_1.

Table 77_1 specifies the usage of RelativeTimeIntervalType for OppCharge, contained in PMaxScheduleEntryType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 77 for semantics and type definition.
### Table 77_1 — Usage of message elements PMaxScheduleEntryType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>duration</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>start</td>
<td>Don’t care.</td>
</tr>
</tbody>
</table>

### 8.5.2.19 ConsumptionCostType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

**Original requirement:**

[V2G2-615] The message element shall be used as defined in Table 78.

**Restriction:**

[V2G2-OC-615_1] The message element shall be used as defined in Table 78_1.

Table 78_1 specifies the usage of ConsumptionCostType for OppCharge, contained in SalesTariffType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 78 for semantics and type definition.

### Table 78_1 — Usage of message elements ConsumptionCostType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>Don’t care. Refer to subclause 8.5.2.20</td>
</tr>
<tr>
<td>StartValue</td>
<td>Don’t care.</td>
</tr>
</tbody>
</table>

### 8.5.2.20 CostType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

**Original requirement:**

[V2G2-616] The message element shall be used as defined in Table 79 and Table 80.

**Restriction:**

[V2G2-OC-616_1] The message element shall be used as defined in Table 79_1.

Table 79_1 specifies the usage of CostType and CostKindType for OppCharge, contained in SalesTariffType in ChargeParameterDiscoveryRes, refer to subclause 8.4.1.8.3. Refer to the original Table 79 for semantics and type definition.

### Table 79_1 — Usage of message elements CostType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>amount</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>amountMultiplier</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>costKind</td>
<td>Don’t care.</td>
</tr>
</tbody>
</table>
8.5.2.21 ServiceParameterListType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in ServiceDetailRes which is not used in OppCharge V 1.2.0

8.5.2.22 ParameterSetType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in ServiceParameterListType in ServiceDetailRes which is not used in OppCharge V 1.2.0

8.5.2.23 ParameterType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in ParameterSetType in ServiceDetailRes which is not used in OppCharge V 1.2.0

8.5.2.24 SelectedServiceListType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-350] The message element shall be used as defined in Table 84.

Restriction:

[V2G2-OC-350_1] The message element shall be used as defined in Table 84_1.

Table 84_1 specifies the usage of SelectedServiceListType in OppCharge, contained in ServicePaymentSelectionReq (subclause 8.4.1.5.2). Refer to the original Table 84 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SelectedService</td>
<td>Refer to subclause 8.5.2.25</td>
</tr>
</tbody>
</table>

8.5.2.25 SelectedServiceType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-352] The message element shall be used as defined in Table 85.

Restriction:

[V2G2-OC-352_1] ServiceID is always set to 1, refer to Table 85_1.

Table 85_1 specifies the usage of SelectedServiceType in OppCharge, contained in SelectedServiceListType (subclause 8.5.2.24). Refer to the original Table 85 for semantics and type definition.
Table 85_1 — Usage of message elements SlectedServiceType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceID</td>
<td>1 (only DC_extended is supported)</td>
</tr>
<tr>
<td>ParameterSetID</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

8.5.2.26 SubCertificatesType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in CertificateChainType. The messages PaymentDetailsReq, CertificateUpdateReq/Res and CertificateInstallationRes which contain this data type are not used in OppCharge V 1.2.0.

8.5.2.27 ListOfRootCertificateIDsType

This clause of ISO/IEC DIS 15118-2 is not applicable. The data type is contained in CertificateUpdateReq and CertificateInstallationReq which are not used in OppCharge V 1.2.0.

8.5.3 AC

This clause of ISO/IEC DIS 15118-2 does not apply. OppCharge does not use AC power transfer.

8.5.4 DC

8.5.4.1 DC_EVSEStatusType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-365] The message element shall be used as defined in Table 91.

Restriction:

[V2G2-OC-365_1] The message elements shall be used as defined in Table 91_1.

EVSEIsolationStatus is only used in CableCheckRes to signal if isolation test is completed. DC_EVSEStatusCode is only used in CableCheckRes to signal if pantograph is moving and if isolation test is in progress or complete, as defined in Table 91_1. Also refer to subclause 8.4.3.2.3 for cable check response.

Table 91_1 specifies the usage of DC_EVSEStatusType in OppCharge, contained in DC_EVSEChargeParameter (subclause 8.5.4.4) used by the following messages:

CableCheckRes (subclause 8.4.3.2.3), PreChargeRes (subclause 8.4.3.3.3), PowerDeliveryRes (subclause 8.4.1.9.3), CurrentDemandRes (subclause 8.4.3.4.3). Refer to the original Table 91 for semantics and type definition.

Table 91_1 — Usage of message elements DC_EVSEStatusType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>NotificationMaxDelay</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>
Element Name | SECC
--- | ---
EVSENotification | Allowed values:  
- None  
- StopCharging

EVSEIsolationStatus | Used only in CableCheckRes:  
- Invalid in case of ongoing isolation test  
- Safe in case of successful isolation test  
Note: in the related openV2G implementation “Valid” is used instead of “Safe”. This will not contradict interoperability.

DC_EVSEStatusCode | Used only in CableCheckRes:  
- Reserved_8: until pantograph is in lower position  
- EVSE_IsolationMonitoringActive: after pantograph is in lower position, until isolation test is finished  
- EVSE_Ready: isolation test is finished.

NOTE: EVSENotification = StopCharging is additionally used in case of EVSE errors. It is expected that EVCC immediately aborts the charging process by going to session stop process.

8.5.4.2 DC_EVStatusType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-368] The message element shall be used as defined in Table 93.

Restriction:

[V2G2-OC-368_1] The message element shall be used as defined in Table 93_1. The parameter EVRESSSOC is mandatory in CurrentDemandReq, refer to subclause 8.4.3.4.2

Table 93_1 specifies the usage of DC_EVStatusType for OppCharge, contained in DC_EVChargeParameter (subclause 8.5.4.3) used in the following messages CableCheckReq (subclause 8.4.3.2.2), PreChargeReq (subclause 8.4.3.3.2), CurrentDemandReq (subclause 8.4.3.4.2). Refer to the original Table 93 for semantics and type definition.

Table 93_1 — Usage of message elements DC_EVStatusType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVReady</td>
<td>Don’t care (default TRUE)</td>
</tr>
<tr>
<td>EVCabinConditioning</td>
<td>Don’t care</td>
</tr>
<tr>
<td>EVRESSConditioning</td>
<td>Don’t care</td>
</tr>
<tr>
<td>EVERrorCode</td>
<td>Don’t care (default NO_ERROR)</td>
</tr>
<tr>
<td>EVRESSSOC</td>
<td>available SOC, mandatory use in CurrentDemandReq, optional for other messages, refer to subclause 8.4.3.4.2</td>
</tr>
</tbody>
</table>

NOTE: Available SOC is fraction of the physical SOC of the battery and is defined by vehicle OEM (subclause 8.4.3.4.2).
8.5.4.3 DC_EVChargeParameterType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-371] The message element shall be used as defined in Table 95.

Restriction:

[V2G2-OC-371_1] The message element shall be used as defined in Table 95_1. DC_EVStatus may not be handled by EVSE, refer to subclause 8.5.4.2.

Table 95_1 specifies the usage of DC_EVChargeParameterType for OppCharge, contained in ChargeParameterDiscoveryReq (subclause 8.4.1.8.2). Refer to the original Table 95 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC_EVStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.2</td>
</tr>
<tr>
<td>EVMaximumCurrentLimit</td>
<td>Maximum current supported by EV</td>
</tr>
<tr>
<td>EVMaximumPowerLimit</td>
<td>Maximum power supported by EV</td>
</tr>
<tr>
<td>EVMaximumVoltageLimit</td>
<td>Maximum voltage supported by EV</td>
</tr>
<tr>
<td>EVEnergyCapacity</td>
<td>Don’t care</td>
</tr>
<tr>
<td>EVEnergyRequest</td>
<td>Don’t care</td>
</tr>
<tr>
<td>FullSOC</td>
<td>Don’t care</td>
</tr>
<tr>
<td>BulkSOC</td>
<td>Don’t care</td>
</tr>
</tbody>
</table>

8.5.4.4 DC_EVSEChargeParameterType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-373] The message element shall be used as defined in Table 96.

Restriction:

[V2G2-OC-373_1] The message element shall be used as defined in Table 96_1. DC_EVSEStatus is not used, refer to subclause 8.5.4.1.

Table 96_1 specifies the usage of DC_EVSEChargeParameterType for OppCharge, contained in ChargeParameterDiscoveryRes (subclause 8.4.1.8.3). Refer to the original Table 96 for semantics and type definition.

<table>
<thead>
<tr>
<th>Element Name</th>
<th>SECC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC_EVSEStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.1</td>
</tr>
<tr>
<td>Element Name</td>
<td>SECC</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>EVSEMaximumCurrentLimit</td>
<td>Deviation to standard: Minimum of EVMaximumCurrentLimit and the maximum current the EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMaximumPowerLimit</td>
<td>Maximum power EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMaximumVoltageLimit</td>
<td>Deviation to standard: Minimum of EVMaximumVoltageLimit and the maximum voltage the EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMinimumCurrentLimit</td>
<td>Minimum current EVSE can deliver</td>
</tr>
<tr>
<td>EVSEMinimumVoltageLimit</td>
<td>Minimum voltage EVSE can deliver</td>
</tr>
<tr>
<td>EVSECURRENTRegulationTolerance</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>EVSEPeakCurrentRipple</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>EVSEEnergyToBeDelivered</td>
<td>Don’t care.</td>
</tr>
</tbody>
</table>

NOTE: The EVSE sends the minimum of EVMAXIMUMVoltageLimit and the maximum voltage the EVSE can deliver. The value of EVMAXIMUMVoltageLimit is sent as confirmation that the limit of the vehicle is accepted and can be provided by the station. Otherwise in case the station can only provide less voltage than the EVMAXIMUMVoltageLimit, it sends the stations limit value. The same approach is applied to the MaximumCurrentLimit.

8.5.4.5  DC_EVPowerDeliveryParameterType

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-375] The message element shall be used as defined in Table 97.

Restriction:

[V2G2-OC-375_1] The message element shall be used as defined in Table 97_1. DC_EVStatus is not used, refer to subclause 8.5.4.1.

Table 97_1 specifies the usage of DC_EVPowerDeliveryParameterType for OppCharge, contained in PowerDeliveryReq (subclause 8.4.1.9.2). Refer to the original Table 97 for semantics and type definition.

Table 97_1 — Usage of message parameter DC_EVPowerDeliveryParameterType

<table>
<thead>
<tr>
<th>Element Name</th>
<th>EVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC_EVStatus</td>
<td>Don’t care. Refer to subclause 8.5.4.2</td>
</tr>
<tr>
<td>BulkChargingComplete</td>
<td>Don’t care.</td>
</tr>
<tr>
<td>ChargingComplete</td>
<td>Don’t care.</td>
</tr>
</tbody>
</table>

8.6 Identification modes and message set definitions

This clause of ISO/IEC DIS 15118-2 is not applicable. This document defines only messages and parameters used in OppCharge V 1.2.0.
8.7 V2G communication timing

8.7.1 Overview

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original statement:

The monitoring of a V2G Communication Session is based on two Timer categories:

-- Communication Setup Timer: Monitors the time from plug-in until the Session Setup message. It allows deciding if the communication setup was successful.

-- Ready to Charge Timer: Monitors the time from plug-in until the first Power Delivery message. It allows deciding if the request for power form the EVCC was successful.

Restriction:

Since OppCharge is via WLAN communication, the plug-in charging timing is not applicable.

In version V 1.2.0 of OppCharge the Communication Setup Timer and Ready to Charge Timer are not used.

8.7.2 Message sequence and communication session

8.7.2.1 Definitions

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Table 103_1 — EVCC and SECC message sequence and session timing parameter values

<table>
<thead>
<tr>
<th>Name</th>
<th>MessageType</th>
<th>Value [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2G_EVCC_Msg_Timeout</td>
<td>SupportedAppProtocol</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>SessionSetup</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ServiceDiscovery</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ServicePaymentSelection</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>PaymentDetails</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>ContractAuthentication</td>
<td>2 (not defined in the original table 103)</td>
</tr>
<tr>
<td></td>
<td>ChargeParameterDiscovery</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>ChargingStatus</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>MeteringReceipt</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>PowerDelivery</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CableCheck</td>
<td>2 (deviation to standard)</td>
</tr>
<tr>
<td></td>
<td>PreCharge</td>
<td>2 (deviation to standard)</td>
</tr>
<tr>
<td></td>
<td>CurrentDemand</td>
<td>0.25</td>
</tr>
<tr>
<td>Name</td>
<td>MessageType</td>
<td>Value [s]</td>
</tr>
<tr>
<td>------</td>
<td>---------------------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>WeldingDetection</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>SessionStop</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CertificateInstallation</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>CertificateUpdate</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

V2G_SECC_Msg_Performance_Time

<table>
<thead>
<tr>
<th>Name</th>
<th>MessageType</th>
<th>Value [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SupportedAppProtocol</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>SessionSetup</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>ServiceDiscovery</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>ServicePaymentSelection</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>PaymentDetails</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>ContractAuthentication</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>ChargeParameterDiscovery</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>ChargingStatus</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>MeteringReceipt</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>PowerDelivery</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>CableCheck</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>PreCharge</td>
<td>0,1</td>
</tr>
<tr>
<td></td>
<td>CurrentDemand</td>
<td>0,025</td>
</tr>
<tr>
<td></td>
<td>WeldingDetection</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>SessionStop</td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>CertificateInstallation</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>CertificateUpdate</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

V2G_EVCC_Sequence_Performance_Time

<table>
<thead>
<tr>
<th>Name</th>
<th>MessageType</th>
<th>Value [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ChargeParameterDiscovery</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>CableCheck</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>PreCharge</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>PowerDelivery</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(all other messages)</td>
<td>Not used</td>
</tr>
</tbody>
</table>

V2G_SECC_Sequence_Timeout

<table>
<thead>
<tr>
<th>Name</th>
<th>MessageType</th>
<th>Value [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CurrentDemandReq</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(all other messages)</td>
<td>60</td>
</tr>
</tbody>
</table>

NOTE: SessionStop, CableCheck, PreCharge, CurrentDemand are looping messages and can cause high message load on communication channel, if transmission interval is too short. For that reason it is recommended to allow up to 10 requests per second.

8.7.2.2 EVCC timing for request-response message pairs

This clause of ISO/IEC DIS 15118-2 is applicable, refer to Table 103_1 for timeout values for each V2G message type.

8.7.2.3 SECC timing for response-request message sequence

This clause of ISO/IEC DIS 15118-2 is applicable, refer to Table 103_1 for timeout values for each V2G message type.
8.7.3 Session setup and ready to charge

This clause of ISO/IEC DIS 15118-2 is not applicable. Session setup timer and ready to charge timer are not used in OppCharge V 1.2.0.

8.8 Message Sequencing and Error Handling

8.8.1 Overview

This clause of ISO/IEC DIS 15118-2 is applicable.

8.8.2 Basic Definitions for Error Handling

This clause of ISO/IEC DIS 15118-2 is applicable.

8.8.3 ResponseCode handling

8.8.3.1 Common requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:


Restriction:

[V2G2-OC-461_1] ResponseCode 'FAILED_SignatureError' is not used for all messages.

Original requirement:

[V2G2-463] The message 'SessionSetupRes' shall contain the specific ResponseCode 'OK_OldSessionJoined' if processing of the SessionSetupReq message was successful and the same SessionID as used in the request message is contained in the response message.

Restriction:

[V2G2-OC-463_1] The message 'SessionSetupRes' does not use ResponseCode 'OK_OldSessionJoined'.

NOTE: It is not a usecase for OppCharge to suspend a session and resume it afterwards. OppCharge is designed to transfer high energy amounts within a short time. Therefore sessions are not suspended, re-negotiation does not take place and charge schedules and profiles are not applied.

Original requirement:

[V2G2-465] The message 'ServicePaymentSelectionRes' shall contain the ResponseCode 'FAILED_PaymentSelectionInvalid' if the SelectedPaymentOption contained in the ServicePaymentSelectionReq message was not part of the offered PaymentOptionList of ServiceDiscoveryRes.
The message 'ServicePaymentSelectionRes' does not use the ResponseCode 'FAILED_PaymentSelectionInvalid'.

Original requirement:

The message 'ServicePaymentSelectionRes' shall contain the ResponseCode 'FAILED_ServiceSelectionInvalid' if the SelectedServiceList contained in the ServicePaymentSelectionReq message contains a ServiceID which was not contained in the offered ServiceList of ServiceDiscoveryRes.

The message 'ServicePaymentSelectionRes' does not use the ResponseCode 'FAILED_ServiceSelectionInvalid'.

Original requirement:

The message 'ContractAuthenticationRes' shall contain the ResponseCode 'FAILED_ChallengeInvalid' if the challenge response contained in the ContractAuthenticationReq message in attribute GenChallenge is not valid versus the provided GenChallenge in PaymentDetailsRes.

The message 'ContractAuthenticationRes' does not use the ResponseCode 'FAILED_ChallengeInvalid'.

Original requirement:

The message 'ChargeParameterDiscoveryRes' shall contain the ResponseCode 'FAILED_WrongEnergyTransferMode' if the content of attribute 'RequestedEnergyTransferMode' in the ChargeParameterDiscoveryReq message is not valid.

The message 'ChargeParameterDiscoveryRes' does not use the ResponseCode 'FAILED_WrongEnergyTransferMode'. If the content of attribute 'RequestedEnergyTransferMode' in the ChargeParameterDiscoveryReq message is not valid, the ResponseCode 'FAILED_WrongChargeParameter' is used.

Original requirement:

The message 'ChargeParameterDiscoveryRes' shall contain the ResponseCode 'FAILED_WrongChargeParameter' if the content of attribute 'EVChargeParameter' in the ChargeParameterDiscoveryReq message is not valid, e.g. wrong parameter set is provided, one or multiple parameters can not be interpreted.
Restriction:

[V2G2-OC-477_1] The message 'ChargeParameterDiscoveryRes' uses the ResponseCode 'FAILED_WrongChargeParameter' only if the content of attribute 'RequestedEnergyTransferMode' is not "DC_extended".

Original requirement:

[V2G2-478] The message 'PowerDeliveryRes' shall contain the ResponseCode 'FAILED_ChargingProfileInvalid' if the content of attribute 'ChargingProfile' in the PowerDeliveryReq message violates a power limitation provided in 'ChargeParameterDiscoveryRes'.

Restriction:

[V2G2-OC-478_1] The message 'PowerDeliveryRes' does not use the ResponseCode 'FAILED_ChargingProfileInvalid'.

Original requirement:

[V2G2-479] The message 'PowerDeliveryRes' shall contain the ResponseCode 'FAILED_TariffSelectionInvalid' if the content of element 'ChargingProfile' in the PowerDeliveryReq message contains a SAScheduleTupleID which was not contained in the 'SAScheduleList' element provided in 'ChargeParameterDiscoveryRes'.

Restriction:

[V2G2-OC-479_1] The message 'PowerDeliveryRes' does not use the ResponseCode 'FAILED_TariffSelectionInvalid'.

Original requirement:

[V2G2-480] The message 'PowerDeliveryRes' shall contain the ResponseCode 'FAILED_PowerDeliveryNotApplied' if the EV supply equipment is not able to deliver energy.

Restriction:


8.8.3.2 AC Specific Requirements

This clause of ISO/IEC DIS 15118-2 does not apply. OppCharge does not use AC power transfer.

8.8.3.3 DC Specific Requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Restriction:

[V2G2-669] and [V2G2-670] are not applied for OppCharge. Refer to subclause 8.4.3.2.3 for related requirements for cable check handling.
8.8.4 Request-Response Message Sequence Requirements

8.8.4.1 General requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

- If the parameter EVSEN-notification in EVSEStatus is equal to StopCharging, the EVCC shall stop charging within the value of the parameter NotificationMaxDelay is in the EVSEStatus.

Deviation:

- If the parameter EVSEN-notification in EVSEStatus is equal to StopCharging, the EVCC shall stop charging immediately, therefore the parameter NotificationMaxDelay is not used. The next allowed request message is SessionStopReq.

Restriction:

Requirements [V2G2_672] [V2G2_673] [V2G2_674] [V2G2_675] [V2G2_676] [V2G2_680] are not applicable for OppCharge.

8.8.4.2 EVCC

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

The EVCC behavior defining all valid request-response message sequences for OppCharge is shown in Figure OC_2.

8.8.4.2.1 Common requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

- The EVCC shall stop the V2G Communication Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAILED_NoNegotiation' according to Table 103.

Deviation:

- The EVCC shall stop the V2G communication session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout of 'supportedAppProtocolRes' according to Table 103_1, or if the response message containing a 'ResponseCode = FAILED_NoNegotiation'.

Original requirement:

- The EVCC shall stop the V2G Communication Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'ServiceDiscoveryRes' according to Table 103.
Deviation:

[V2G2-OC-488_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or ‘ResponseCode = FAIL’ of ‘ServiceDiscoveryRes’.

Original requirement:

[V2G2-492] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'ServicePaymentSelectionRes' according to Table 103.

Deviation:

[V2G2-OC-492_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or ‘ResponseCode = FAIL’ of ‘ServicePaymentSelectionRes’.

Original requirement:

[V2G2-504] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of ‘ContractAuthenticationRes’ according to Table 103.

Deviation:

[V2G2-OC-504_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or ‘ResponseCode = FAIL’ of ‘ContractAuthenticationRes’.

Original requirement:

[V2G2-506] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of ‘ChargeParameterDiscoveryRes’ according to Table 103.

Deviation:

[V2G2-OC-506_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or ‘ResponseCode = FAIL’ of ‘ChargeParameterDiscoveryRes’.

Original requirement:

[V2G2-507] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of ‘SessionStopRes’ according to Table 103.
Deviation:

[V2G2-OC-507_1] The EVCC shall continue to send a new SessionStopReq, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or 'ResponseCode = FAIL' of 'SessionStopRes'.

[V2G2-OC-507_2] If EVCC does not receive a SessionStop response within V2G_EVCC_MSG_Timeout, EVCC shall stop the communication session but not release the immobilization.

New requirements:

[V2G2-OC-720] After the 1st SessionStop response with 'ResponseCode = OK', EVCC may send further SessionStop requests with the same session_id. In that case the SECC may continue answering with SessionStop response and 'ResponseCode = OK'.

[V2G2-OC-721] All ResponseCodes of SessionStop response other than “OK” are handled like 'ResponseCode = FAILED'. (e.g. Handling of ResponseCodes FAILED_SequenceError).

[V2G2-OC-722] If EVCC receives a response message with a different SessionID than the SessionID it received in the SessionSetupRes, it shall ignore the message.

Restriction:

Requirements [V2G2_489] [V2G2_491] [V2G2_493] [V2G2_494] [V2G2_495] [V2G2_496] [V2G2_497] [V2G2_498] [V2G2_499] [V2G2_500] [V2G2_501] [V2G2_502] [V2G2_503] [V2G2_683] [V2G2_684] [V2G2_685] are not applicable for OppCharge.

8.8.4.2.2 AC specific requirements

This clause of ISO/IEC DIS 15118-2 does not apply. OppCharge does not use AC power transfer.

8.8.4.2.3 DC specific requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-524] The EVCC shall stop the V2G Communication Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'CableCheckRes' according to Table 103.

Deviation:

[V2G2-OC-524_1] The EVCC shall send a SessionStopReq to stop the V2G Communication Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1, or 'ResponseCode = FAIL' of 'CableCheckRes', or EVSEProcessing = Finished, but EVSEIsolationStatus = Fault.

Note [V2G2-OC-713] states out that CableCheckRes sends 'ResponseCode = FAIL' in case of an isolation fault. It is recommended to use the ResponseCode for error handling. That allows a uniform error handling to all messages.
Original requirement:

[V2G2-526] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'PreChargeRes' according to Table 103.

Deviation:

[V2G2-OC-526_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or 'ResponseCode = FAIL' of 'PreChargeRes'.

Original requirement:

[V2G2-529] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'PowerDeliveryRes' according to Table 103.

Deviation:

[V2G2-OC-529_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or 'ResponseCode = FAIL' of 'PowerDeliveryRes'.

Original requirement:

[V2G2-532] The EVCC shall stop the V2G_Communication_Session when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout or 'ResponseCode = FAIL' of 'CurrentDemandRes' according to Table 103.

Deviation:

[V2G2-OC-532_1] The EVCC shall send a SessionStopReq to stop the V2G_Communication_Session, when V2G_EVCC_Msg_Timer is equal or larger than V2G_EVCC_Msg_Timeout according to Table 103_1 or 'ResponseCode = FAIL' of 'CurrentDemandRes'.

Restriction:

Requirements [V2G2_533] [V2G2_534] [V2G2_620] [V2G2_535] [V2G2_686] are not applicable for OppCharge.
Figure OC_2 EVCC Communication states for OppCharge V2G messaging
8.8.4.3 SECC

The SECC behavior defining all valid request-response message sequences for OppCharge is shown in Figure_OC_3:

8.8.4.3.1 Common requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

V2G2-536] The SECC shall enter a wait state for supportedAppProtocolReq, set the timeout V2G_SECC_Sequence_Timeout to the value MessageType as defined in Table 103, reset the V2G_SECC_Sequence_Timer and start monitoring the V2G_SECC_Sequence_Timer.

Deviation:

[V2G2-OC-536_1] The SECC shall enter a wait state for supportedAppProtocolReq without timeout handling. The SECC continuously waits for supportedAppProtocolReq.

Original requirement:

[V2G2-537] The SECC shall Stop the V2G Communication Session when V2G_SECC_Sequence_Timer is equal or larger than V2G_SECC_Sequence_Timeout according to Table 103.

Addition:

[V2G2-OC-537_1] When V2G_SECC_Sequence_Timer is equal or larger than V2G_SECC_Sequence_Timeout according to Table 103_1 then the SECC shall wait for SessionStopReq.

Original requirement:

[V2G2-538] The SECC shall respond with the corresponding response message containing a “ResponseCode = FAILED_SequenceError” within V2G_SECC_Msg_Performance_Time according to Table 103, if request message was received that the SECC does not expect in the wait state.

Deviation:

[V2G2-OC-538_1] The SECC shall respond with the corresponding response message containing a “ResponseCode = FAILED_SequenceError” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if request message was received that the SECC does not expect in the wait state. The SECC shall then wait for SessionStopReq.

Original requirement:

[V2G2-545] The SECC shall respond with a ServiceDiscoveryRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is passed successfully. The allowed next request shall be ServiceDetailReq and ServiceAndPaymentSelectionReq and the V2G_SECC_Sequence_Timeout is set according to Table 103.
Deviation:

[V2G2-OC-545_1] The SECC shall respond with a ServiceDiscoveryRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is passed successfully. The allowed next request shall be ServiceAndPaymentSelectionReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-546] The SECC shall respond with a ServiceDiscoveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-546_1] The SECC shall respond with a ServiceDiscoveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.

Original requirement:

[V2G2-551] The SECC shall respond with a ServicePaymentSelectionRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is successfully passed. The allowed next request shall be PaymentDetailReq, CertificateInstallationReq and CertificateUpdateReq if Message Set “AC Charging Pnc” is selected and ContractAuthenticationReq if Message Set “AC Charging EIM” is selected. V2G_SECC_Sequence_Timeout is set according to Table 103.

Deviation:

[V2G2-OC-551_1] The SECC shall respond with a ServicePaymentSelectedRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is successfully passed. The allowed next request shall be ContractAuthenticationReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-552] The SECC shall respond with a ServicePaymentSelectionRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-552_1] The SECC shall respond with a ServicePaymentSelectionRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.
Original requirement:

[V2G2-564] The SECC shall respond with ContractAuthenticationRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-564_1] The SECC shall respond with ContractAuthenticationRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully and then wait for SessionStopReq.

Original requirement:

[V2G2-566] The SECC shall respond with ChargingParameterDiscoveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-566_1] The SECC shall respond with ChargingParameterDiscoveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully and then wait for SessionStopReq.

Original requirement:

[V2G2-572] The SECC shall respond with SessionStopRes containing “ResponseCode = FAILED” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successful.

Addition:

[V2G2-OC-572_1] In case of OppCharge the SECC shall respond with SessionStopRes containing “ResponseCode = FAILED”, if the pantograph is going to be raised and not in the upper home position.

New requirements:

[V2G2-OC-723] If SECC does not receive a SessionStop request within V2G_SECC_Sequence_Timeout, SECC shall command the ACD to its home position (if not already done) and stop the communication session. After the ACD has reached its home position SECC shall accept new sessions.

[V2G2-OC-724] If SECC does not detect ACD in its home position within V2G_SECC_ACD_Disconnection_Timeout, it shall change to error mode and keep sending SessionStop response with ‘ResponseCode = FAILED’ when a SessionStop request is received.
Restriction:

Requirements [V2G2-547] [V2G2-548] [V2G2-549] [V2G2-553] [V2G2-554] [V2G2-555] [V2G2-556] [V2G2-557] [V2G2-558] [V2G2-559] [V2G2-560] [V2G2-561] [V2G2-567] [V2G2-568] [V2G2-659] [V2G2-687] [V2G2-688] are not applicable for OppCharge.

NOTE: Requirements [V2G2-567], [V2G2-568], [V2G2-569] are applicable for AC, but the standard refers it in the common chapter.

8.8.4.3.2 AC specific requirements

This clause of ISO/IEC DIS 15118-2 does not apply. OppCharge does not use AC power transfer.

8.8.4.3.3 DC specific requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Original requirement:

[V2G2-582] The SECC shall respond with ChargeParameterDiscoveryRes containing "ResponseCode = OK" and "EVSEProcessing=Finished" and a valid parameter SASchedule within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is successfully passed. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103.

Deviation:

[V2G2-OC-582_1] The SECC shall respond with ChargeParameterDiscoveryRes containing "ResponseCode = OK" and "EVSEProcessing=Finished" within V2G_SECC_Msg_Performance_Time according to Table 103.1, if the processing of the information is successfully passed. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-658] The SECC shall measure state C or D as defined in IEC 61851-1 (IO-SET_CPSTATE.indication (CPState=C or D)) before receiving a Cable Check Request for sending a Cable Check Response Message with parameter ResponseCode set to ‘OK’ otherwise it shall send ResponseCode set to ‘FAILED’.

Restriction:

[v2G2-658] is not applied for OppCharge. Refer to subclause 8.4.3.2.3 for related requirements for cable check handling.

Original requirement:

[V2G2-584] The SECC shall respond with CableCheckRes containing ResponseCode = "OK" and "EVSEProcessing=Finished" within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is successfully passed and cable check is finished. The allowed next request shall be PreChargeReq and the V2G_SECC_Sequence_Timeout is set according to Table 103.
Deviation:

[V2G2-OC-584_1] The SECC shall respond with CableCheckRes containing ResponseCode = OK", "EVSEProcessing=Finished", EVSEStatusCode = EVSE_Ready, EVSEIsolationStatus = Safe within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is successfully passed and cable check is finished as defined in subclause 8.4.3.2.3. The allowed next request shall be PreChargeReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-621] The SECC shall respond with CableCheckRes containing ResponseCode = OK" and "EVSEProcessing=Ongoing" within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is successfully passed and cable check is ongoing. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103.

Deviation:

[V2G2-OC-621_1] The SECC shall respond with CableCheckRes containing ResponseCode = OK", "EVSEProcessing=Ongoing", EVSEStatusCode = Reserved_8, EVSEIsolationStatus = Invalid within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is successfully passed and the pantograph has not reached the end position yet as defined in subclause 8.4.3.2.1. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

[V2G2-OC-621_2] The SECC shall respond with CableCheckRes containing ResponseCode = OK", "EVSEProcessing=Ongoing", EVSEIsolationStatus = Invalid within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is successfully passed and the isolation test has not completed yet as defined in subclause 8.4.3.2.1. The allowed next request shall be CableCheckReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-585] The SECC shall respond with CableCheckRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-585_1] The SECC shall respond with CableCheckRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.
Original requirement:

[V2G2-588] The SECC shall respond with PreChargeRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-588_1] The SECC shall respond with a PreChargeRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.

Original requirement:

[V2G2-601] The SECC shall respond with a PowerDeliveryRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is successfully passed and the request contained “ReadyToCharge = FALSE”. The allowed next request shall be ChargeParameterDiscoveryReq and WeldingDetectionReq and SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103.

Deviation:

[V2G2-OC-601_1] The SECC shall respond with a PowerDeliveryRes containing “ResponseCode = OK” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is successfully passed and the request contained “ReadyToCharge = FALSE”. The allowed next request shall be SessionStopReq and the V2G_SECC_Sequence_Timeout is set according to Table 103_1.

Original requirement:

[V2G2-591] The SECC shall respond with PowerDeliveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.

Deviation:

[V2G2-OC-591_1] The SECC shall respond with PowerDeliveryRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.

Original requirement:

[V2G2-595] The SECC shall respond with CurrentDemandRes containing “ResponseCode = FAIL” within V2G_SECC_Msg_Performance_Time according to Table 103, if the processing of the information is not successfully.
Deviation:

[V2G2-OC-595_1] The SECC shall respond with a CurrentDemandRes containing "ResponseCode = FAIL" within V2G_SECC_Msg_Performance_Time according to Table 103_1, if the processing of the information is not successfully and then wait for SessionStopReq.

Restriction:

Requirements [V2G2_596] [V2G2_597] [V2G2_598] are not applicable for OppCharge.
V2G communication interface for OppCharge, V 1.3.0, ACD extension of ISO/IEC DIS 15118-2 (2012)

Figure OC_3 SECC Communication states for DC V2G messaging
8.9 Request-Response Message Sequence Examples

8.9.1 AC

This clause of ISO/IEC DIS 15118-2 does not apply. OppCharge does not use AC power transfer.

8.9.2 DC

8.9.2.1 EIM

This clause of ISO/IEC DIS 15118-2 is not applicable for OppCharge.

8.9.2.2 PnC

This clause of ISO/IEC DIS 15118-2 is not applicable for OppCharge.

8.9.2.3 OppChage

Figure OC_4 depicts an example for a Request-Response Message Sequence for the OppCharge without any errors.
Figure OC_4  OppCharge V2G message sequence example
Annex A
(informative)

Mapping of Part 1 use case elements

A.1 Relation of Identification Modes and Use Case Elements

Table A. 1 of ISO/IEC DIS 15118-2 is not applicable for OppCharge and has not been updated.
Annex B
(informative)

Mapping of ISO 15118 message element names to SAE J2847/2 terms

This clause of ISO/IEC DIS 15118-2 is applicable.
Annex C
(normative)

Schema definition

This clause of ISO/IEC DIS 15118-2 is applicable.
Annex D
(informative)

Message examples

This clause of ISO/IEC DIS 15118-2 is applicable.
Annex E

(informative)

Application of certificates

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication Interface V 1.2.0.

Certificates are not used.
Annex F
(informative)

Security appliances and their associated certificates

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication Interface V 1.2.0.

Certificates are not used.
Annex G
(informative)

Simplified Certificate Management in Trusted Environment

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication Interface V 1.2.0.

Certificates are not used.
Certificate profiles

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication Interface V 1.2.0.

Certificates are not used.
Annex I
(normative)

Using Contract Certificates for XML encryption

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication.
Certificates are not used.
Annex J
(normative)

Use of OEM Provisioning Certificates

This clause of ISO/IEC DIS 15118-2 does not apply to OppCharge Data Communication Interface V 1.2.0.

Certificates are not used.
Annex K
(informative)

Summary of requirements

This clause of ISO/IEC DIS 15118-2 is applicable except as follows:

Deviation:

Open Issue: Table will be available soon.
Bibliography

This clause of ISO/IEC DIS 15118-2 is applicable.