OCPP 2.0.1

Part 5 - Certification Profiles

Core & Advanced Security, FINAL, 2023-06-30

Table of Contents

1. Introduction & Reading Guide

This document describes the certification profiles for OCPP 2.0.1. These profiles are sets of use cases that can be certified via the Open Charge Alliance. This document contains the details on what is part of the OCPP 2.0.1 Certification. This document contains:

- The certification profiles and an overview of the functionality per profile.
- The list of optional features. This list contains specific functionality that is not mandatory for certification, but which can optionally be certified.
- The list of test cases for each of the certification profiles.
- The overview of the controller components that must be implemented per profile for certification testing.

For clarity: in the context of the OCPP Certification Program, the term *test case* refers to a sequence of messages for testing a use case from OCPP. The term *feature* refers to a functionality, that can be tested with one or more test cases (see Features for a more detailed explanation). Instead of making specific test cases mandatory or optional, the certification program for OCPP 2.0.1 works with *features* that are optional. Depending on whether the System Under Test (SUT) has implemented a feature, the test case(s) that belong to this feature, must be successfully passed or not.

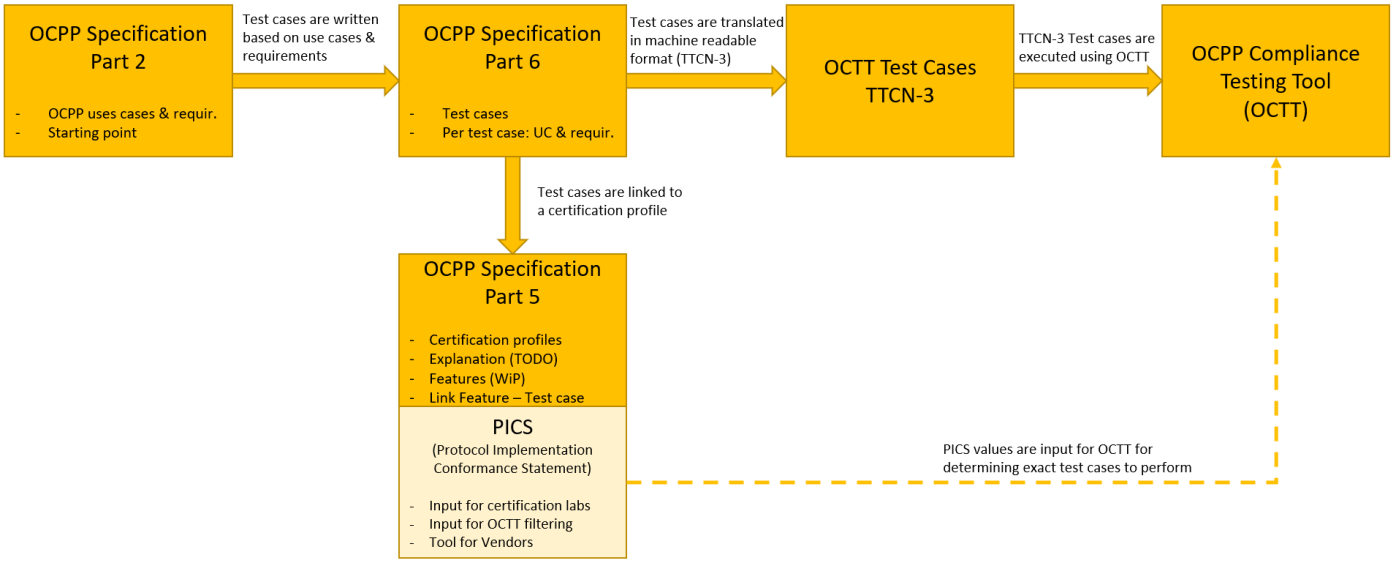

Figure 1. Link between different OCPP Documents in OCPP Certification Program

2. Certification profiles

The OCPP protocol has been designed to support a wide variety of charging stations ranging from simple AC home chargers to advanced DC hyperchargers and megawatt chargers. It will be obvious that these charging stations and associated CSMSs will have very different capabilities. As a result it does not make sense to require every vendor to certify for the full OCPP functionality, when only subset is needed for the specific application.

The OCPP certification is built around certification profiles that describe a set of supported functions. A full OCPP certification comprises all certification profiles, but it is possible to get certified for a subset, since not all OCPP functionality may be needed for some vendors.

The OCPP "Core" profile must always be present. It contains the basic OCPP functionality. On top of that other profiles can be added to the certification. These profiles are independent of each other, the only exception being the "ISO 15118 support" profile, which requires a number of "Advanced security" and "Smart charging" test cases to be implemented.

The following table lists the certification profiles and an overview of the functionality per profile:

Table 1. Certification profiles

Certification Profile	Description
Core	Basic Authentication TLS - server-side certificate Update Charging Station Password for HTTP Basic Authentication Security Event Notification Booting a Charging Station Configuring a Charging Station Resetting a Charging Station / EVSE Authorization incl. GroupId Stop Transaction with a Master Pass Local start transaction - Cable plugin first & Authorization first Start / Stop transaction options Disconnect cable on EV-side Check Transaction status Remote start / stop transaction Remote unlock Connector Remote Trigger Change Availability - Charging Station / EVSE / Connector Clock-aligned Meter & Sampled Meter Values Install CA certificates Retrieve certificates from Charging Station Delete a certificate from a Charging Station AdditionalRootCertificateCheck Retrieve Log Information Get / Clear Customer Information Secure Firmware Update Store / Clear Authorization Data in Authorization Cache Authorization through authorization cache
Advanced Security	TLS - Client-side certificate Update Charging Station Certificate Upgrade Charging Station Security Profile
Local Authorization List Management	Authorization through local authorization list Send Local Authorization List Get Local List Version
Smart Charging	Set charging profile Remote start transaction with charging profile Get Composite Schedule Get Charging Profile Clear Charging Profile

Certification Profile	Description
Advanced Device Management	Get Monitoring report Set Monitoring Base Set Variable Monitoring Set Monitoring Level Get Custom Report Clear / Remove Monitoring Event Notification
Advanced User Interface	Set Display Message Get Display Message Clear a Display Message Show EV Driver Running / Final Total Cost During / After Charging Show EV Driver-specific Tariff Information Update Tariff Information During Transaction Configure Fallback Tariff Information & Total Cost Message
Reservation	Reserve a specific EVSE Reserve an unspecified EVSE Reserve a connector with a specific type Reservations using GroupIdToken Cancel reservation of an EVSE
ISO 15118 support	*ISO 15118 Certificate Management:* Update Charging Station Certificate (Contract) Certificate Installation / Update EV Get Certificate Status Install V2G / MO CA certificates Retrieve V2G / MO certificates from Charging Station Delete a certificate from a Charging Station *ISO 15118 EIM / PnC Authorization:* Authorization using External Identification Means Authorization using Contract Certificates *ISO 15118 Smart Charging:* Set charging profile Remote start transaction with charging profile Get Composite Schedule Get Charging Profile Clear Charging Profile Renegotiating a Charging Schedule ISO 15118 signed meter values

3. Features

The concept of certification profiles is not enough to cover the variety in OCPP implementations. The OCPP specification contains many optional features, often in the form of optional message fields or configuration variables, that a vendor can use to support advanced functions. Whereas the certification profiles determine *which* OCPP functionality is implemented, the features describe *how much* of a certain functionality in a profile has been implemented.

The OCTT test tool uses the features to determine which test cases have to be executed for a charging station or CSMS. For example, the set of TxStartPoints that a charging station supports, has a big impact on the execution of certain test cases. The behavior of a charging station that starts a transaction based on a successful authorization is different from a charging station that starts a transaction as soon as a cable is connected. Similarly, a CSMS that only controls DC fast chargers will not need functionality to unlock a cable at the charging station. For such a CSMS the vendor may decide to not implement the feature Support for unlocking connector.

In most cases a feature corresponds the existence of a configuration variable or its value.

3.1. Optional feature list for charging station

The following table lists the optional features. These are features that are not mandatory to implement within a certification profile. Where applicable the associated configuration variable is mentioned in parenthesis.

Table 2. Optional features for charging stations

Id	Feature	Charging Station
Core		
C-01	Support for offline authorization of transactions	Optional. Supporting this feature depends on whether at least one of the following is supported; - Certification Profile: Local Authorization List Management - C-02: Support for allowing offline authorization for unknown ids - C-49: Authorization Cache (AuthCacheEnabled)
C-02	Support for allowing Offline Authorization for Unknown Ids (OfflineTxForUnknownIdEnabled)	Optional
C-03	Support for maximizing energy for invalid ids (MaxEnergyOnInvalidId)	Optional
C-04	Support to limit StatusNotifications (MinimumStatusDuration)	Optional
C-05	Support for changing WebSocketPingInterval (WebSocketPingInterval)	Optional
C-06	Authorization status after cable disconnected on EV side (StopTxOnEVSideDisconnect)	{ list } at least one
C-06.1	Support for maintaining authorization when cable disconnected on EV side	Optional
C-06.2	Support for not maintaining authorization when cable disconnected on EV side	Optional
C-07	Support for using a Master Pass for charging stations with UI (MasterPassGroupId)	Optional
C-08	Support for using a Master Pass for charging stations without UI (MasterPassGroupId)	Optional
C-09	Supported Transaction Start points (TxStartPoint)	{ list } at least one
C-09.1	Start transaction options - EVConnected	Optional
C-09.2	Start transaction options - Authorized	Optional
C-09.3	Start transaction options - DataSigned	Optional
C-09.4	Start transaction options - PowerPathClosed	Optional
C-09.5	Start transaction options - EnergyTransfer	Optional
C-09.6	Start transaction options - ParkingBayOccupancy	Optional
C-10	Supported Transaction Stop points (TxStopPoint)	{ list } at least one
C-10.1	Stop transaction options - EVConnected	Optional
C-10.2	Stop transaction options - Authorized	Optional
C-10.3	Stop transaction options - PowerPathClosed	Optional
C-10.4	Stop transaction options - EnergyTransfer	Optional
C-10.5	Stop transaction options - ParkingBayOccupancy	Optional
C-12	Unlocking of connector when cable disconnected on EV side (UnlockOnEVSideDisconnect)	{ list } at least one
C-12.1	Support for unlocking connector when cable disconnected on EV side	Optional
C-12.2	Support for not unlocking when cable disconnected on EV side	Optional
C-13	Support for Reset per EVSE (AllowReset)	Optional
C-14	Support for retrieving / deleting CustomerInformation - CustomerIdentifier	Optional
C-20	Allowing New Sessions Pending a FirmwareUpdate (AllowNewSessionsPendingFirmwareUpdate)	Optional
C-21	Support for queuing all or only Transaction related messages until they are delivered to the CSMS (QueueAllMessages)	Optional

Id	Feature	Charging Station
Time related settings		
C-23	Supported time sources (TimeSource)	{ list } at least Heartbeat
C-25	Support for setting a TimeOffset (TimeOffset)	Optional
C-26	Support for setting the TimeZone (TimeZone)	Optional
C-28	Toggle sending clock aligned meter values when a transaction is ongoing / Idle (AlignedDataSendDuringIdle)	Optional
C-29	TriggerMessage	{ list } 1 or more (Heartbeat MUST be supported) (Security related triggers are separate.)
C-29.1	Trigger message - MeterValues	Optional
C-29.2	Trigger message - TransactionEvent	Optional
C-29.3	Trigger message - LogStatusNotification	Optional
C-29.4	Trigger message - FirmwareStatusNotification	Optional
C-29.5	Trigger message - StatusNotification	Optional
C-29.6	Trigger message - BootNotification	Optional
Authorization options for local start		
C-30	Authorization - using RFID ISO14443	Optional
C-31	Authorization - using RFID ISO15693	Optional
C-32	Authorization - using KeyCode	Optional
C-33	Authorization - using locally generated id	Optional
C-34	Authorization - MacAddress	Optional
C-35	Authorization - NoAuthorization	Optional
Authorization options for remote start (mandatory to support at least one)		
C-36	Authorization - using RFID ISO14443	Optional
C-37	Authorization - using RFID ISO15693	Optional
C-38	Authorization - using centrally, in the CSMS (or other server) generated id	Optional
C-39	Authorization - NoAuthorization	Optional
C-40	Supported MeterValue Measurands	
C-40.1	SampledTxStartedMeasurands	{ list of supported } at least one
C-40.2	SampledTxUpdatedMeasurands	{ list of supported } at least one
C-40.3	SampledTxEndedMeasurands	{ list of supported } at least one
C-40.4	AlignedDataMeasurands	{ list of supported } at least one
C-40.5	AlignedDataTxEndedMeasurands	{ list of supported } at least one
C-41	Supported Cipher Suites	{ list of cipher suites } → at least one of TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256 TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384 OR TLS_RSA_WITH_AES_128_GCM_SHA256 TLS_RSA_WITH_AES_256_GCM_SHA384
C-42	Signed Metervalues (SampledDataSignReadings)	Optional
C-43	Install Firmware with ongoing transaction(s) (AllowNewSessionsPendingFirmwareUpdate)	Optional
C-47	Support for falling back to default OCPP reconnection mechanism when NetworkConnection profile connection has failed	Optional
C-48	Authorization of remote start (AuthorizeRemoteStart)	{ list } at least one
C-48.1	Option for authorization in case of a remote start	Optional
C-48.2	Option for no authorization in case of a remote start	Optional

Id	Feature	Charging Station
C-58	Option for disabling remote authorization (DisableRemoteAuthorization)	Optional
C-49	Authorization Cache (AuthCacheEnabled)	Optional
C-59	Option for disabling remote authorization for cached invalid idTokens (AuthCacheDisablePostAuthorize)	Optional
C-51	Configurable TxStartPoint	Optional
C-52	Configurable TxStopPoint	Optional
C-53	Support for lifetime cached token (AuthCacheLifeTime)	Optional
C-54	Supported policies for replacing cached entries (AuthCachePolicy)	{ list } at least one that is / are supported.
C-56	Support for providing the SummaryInventory	Optional
C-57	Support for cancelling ongoing log file upload	Optional
C-60	Support for cancelling ongoing firmware update	Optional
Advanced Security		
AS-2	Additional root certificate check mechanism implemented (AdditionalRootCertificateCheck)	Optional
AS-3	Update Charging Station Certificate - CertificateSignedRequest Timeout (CertSigningWaitMinimum,CertSigningRepeatTimes)	Optional

3.2. Optional feature list for CSMS

The features of a CSMS are not determined by configuration variables. Features in the list below are allowed not to be supported by a CSMS.

Table 3. Optional features for CSMS

Id	Feature	CSMS
Core		
C-11	Support for unlocking connector for charging station with detachable cable (UnlockConnector message).	Optional
C-13	Support for Reset per EVSE	Optional
C-14	Support for retrieving / deleting CustomerInformation - CustomerIdentifier	Optional
C-15	Support for scheduled firmware updates	Optional
C-16	Support for checking the TransactionStatus	Optional
C-17	Support for retrieving the ConfigurationInventory	Optional
C-29	TriggerMessage	{ list } 0 or more (Security related triggers are separate.)
C-29.1	Trigger message - MeterValues	Optional
C-29.2	Trigger message - TransactionEvent	Optional
C-29.3	Trigger message - LogStatusNotification	Optional
C-29.4	Trigger message - FirmwareStatusNotification	Optional
C-29.5	Trigger message - StatusNotification	Optional
Authorization options for local start		
C-30	Authorization - using RFID ISO14443	Required
C-31	Authorization - using RFID ISO15693	Required
C-32	Authorization - using KeyCode	Optional
C-33	Authorization - using locally generated id	Optional
C-34	Authorization - MacAddress	Optional
C-35	Authorization - NoAuthorization	Required
Authorization options for remote start (mandatory to support at least one)		
C-36	Authorization - using RFID ISO14443	Required
C-37	Authorization - using RFID ISO15693	Required
C-38	Authorization - using centrally, in the CSMS (or other server) generated id	Optional

Id	Feature	CSMS
C-39	Authorization - NoAuthorization	Optional
C-44	Support for sending a BootNotification Pending before Accepting	Optional
C-45	Support for Multiple elements GetVariablesRequest	Optional
C-46	Support for Multiple elements SetVariablesRequest	Optional
C-50	GetBaseReport - FullInventory	{ list } at least one
C-50.1	GetBaseReport - FullInventory - During onboarding	Optional
C-50.2	GetBaseReport - FullInventory - Manual trigger	Optional
Advanced Security		
	No optional features for this profile	

4. List of test cases

4.1. Introduction

This table lists the test cases that are part of the OCPP Certification program. For each of the test cases, the columns "Conf. Test for Charging Station" and "Conf. Test for CSMS" indicate whether the test case is mandatory or not within a Certification Profile. The abbrevations have the following meaning:

- M = Mandatory . This means that IF you implement the certification profile this test case belongs to, you MUST successfully pass this test case.
- C = Conditional. This means that IF you meet a condition, you MUST pass this test case. Most conditions refer to the optional features that are listed in the Features.

4.2. Test Cases Core

					Related features	
OCTT Id	**OCPP Compliance Testing Tool scenario**	**Conf. Test for Charging Station**	**Conf. test for CSMS**	**Condition / remark**	**Feature no.**	**Feature**
	Basic Authentication					
TC_A_01	Valid username/password combination	M	M			
TC_A_02	Username does not equal ChargingStationId		M			
TC_A_03	Invalid password		M			
	Update Charging Station Password for HTTP Basic Authentication					
TC_A_09	Accepted	M	M			
TC_A_10	Rejected	M	M			
	TLS - server-side certificate					
TC_A_04	Valid certificate	M	M			
TC_A_05	Invalid certificate	M				
TC_A_06	TLS version too low	M	M			
	Upgrade Charging Station Security Profile					
TC_A_19	Accepted	M	M			
TC_A_20	No valid CSMSRootCertificate installed	C		If the last CSMSRootCertificate can be removed.	AQ-1	Can the last CSMSRootCertificate be removed?
TC_A_22	Downgrade security profile - Rejected	M				
	Cold Boot Charging Station					

					Related features	
TC_B_01	Accepted	M	M			
TC_B_02	Pending	M	C	CSMS: If Pending mechanism is implemented	C-44	BootNotification Pending
TC_B_03	Rejected	M				
TC_B_30	Pending/Rejected - SecurityError	M	C	For CSMS: if CSMS can be configured to first respond to a BootNotificationRequest with status Pending or Rejected	C-44 or NOT AQ-6	BootNotification Pending or Does the CSMS reject unknown Charging Stations during websocket connection setup?
TC_B_31	Pending/Rejected - TriggerMessage		C	For CSMS: if CSMS can be configured to first respond to a BootNotificationRequest with status Pending or Rejected	C-44 or NOT AQ-6	BootNotification Pending or Does the CSMS reject unknown Charging Stations during websocket connection setup?
	Status change during offline period					
TC_B_51	> Offline Threshold	M				
TC_B_52	< Offline Threshold	M				
	Get Variables					
TC_B_06	single value	M	M			
TC_B_07	multiple values	M	C	If the CSMS supports multiple elements in a GetVariablesRequest	C-45	multiple values elements GetVariablesRequest
TC_B_32	Unknown component	M				
TC_B_33	Unknown variable	M				
TC_B_34	Not supported attribute type	M				
TC_B_08	limit to maximum number of values	C		If the Charging Station supports BytesPerMessageGetVariables	ORS-5	BytesPerMessageGetVariables
	Set Variables					
TC_B_09	single value	M	M			
TC_B_10	multiple values	M	C	If the CSMS supports multiple elements in a SetVariablesRequest	C-46	multiple values elements SetVariablesRequest
TC_B_35	Unknown component	M				
TC_B_36	Unknown variable	M				
TC_B_37	Not supported attribute type	M				
TC_B_11	invalidly formatted values	M				
TC_B_39	Read-only	M				
	Get Base Report					
TC_B_12	ConfigurationInventory	M	C		C-17	ConfigurationInventory

					Related features	
TC_B_13	FullInventory	M	C		C-50.2	GetBaseReport - FullInventory - Manual trigger
TC_B_15	Not Supported base report	C		For CS: If reportBase SummaryInventory is not supported. This is the case when Certification Profile *Advanced Device Management* is not supported.	Not C-56	
TC_B_53	Test mandatory DM variables via FullInventory	M				
	Reset Charging Station					
TC_B_20	Without ongoing transaction - OnIdle	M	M			
TC_B_21	With Ongoing Transaction - OnIdle	M	M			
TC_B_22	With Ongoing Transaction - Immediate	M	M			
TC_B_23	Unavailable persists reset	M				
TC_B_41	With multiple ongoing transactions - OnIdle	C		For CS: if no. of EVSEs > 1	HFS-8 > 1	
	Reset EVSE					
TC_B_25	Without ongoing transaction	C	C		C-13	Reset per EVSE
TC_B_26	With Ongoing Transaction - OnIdle	C	C		C-13	Reset per EVSE
TC_B_27	With Ongoing Transaction - Immediate	C	C		C-13	Reset per EVSE
TC_B_28	Not Supported	C		For CS: Charging Station does not support resetting an individual EVSE	NOT C-13	Reset per EVSE
TC_B_29	With ongoing transaction - Not Supported	C		For CS: Charging Station does not support resetting an individual EVSE	NOT C-13	Reset per EVSE
	Set new NetworkConnectionProfile					
TC_B_42	Accepted		M			
TC_B_43	Rejected	M				
TC_B_44	Failed		M			
	Migrate to new ConnectionProfile					
TC_B_45	Success - Same CSMS Root	M		For CS: at least two configuration slots for networkConnectionProfiles must be supported		
TC_B_46	Fallback mechanism - Same CSMS Root	M		For CS: at least two configuration slots for networkConnectionProfiles must be supported		
TC_B_47	Fallback after NetworkProfileConnectionAttempts per NetworkConfigurationPriority failed - New CSMS Root - New CSMS	C		For CS: at least two configuration slots for networkConnectionProfiles must be supported	AS-2 and C-47	Additional Root Certificate check mechanism implemented & Reconnect after NetworkProfileConnectionAttempts

					Related features	
TC_B_49	Fallback after NetworkProfileConnectionAttempts per NetworkConfigurationPriority failed - Same CSMS Root	C		For CS: at least two configuration slots for networkConnectionProfiles must be supported	C-47	Reconnect after NetworkProfileConnectionAttempts
TC_B_50	Success - New CSMS Root - New CSMS	C		For CS: at least two configuration slots for networkConnectionProfiles must be supported	AS-2	Additional Root Certificate check
	Network Reconnection					
TC_B_57	After connection loss	M				
	Local start transaction					
TC_C_02	Authorization Invalid/Unknown	C	M	Charging Station: - The Charging Station supports at least one of the following local start authorization options C-30, C-31, C-32, C35 - The Charging Station does NOT have a cable lock that prevents the EV driver to connect the EV and EVSE before authorization.	(C-30 or C-31 or C-32 or C-35) and NOT AQ-2	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode / NoAuthorization and Does the Charging Station have a cable lock, which prevents the EV driver to connect the EV and EVSE before authorization?
TC_C_06	Authorization Blocked	C	M	For CS: - The Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 - The Charging Station does NOT have a cable lock, which prevents the EV driver to connect the EV and EVSE before authorization.	NOT AQ-2 and (C-30 or C-31 or C-32)	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode
TC_C_07	Authorization Expired	C	M	For CS: - The Charging Station supports at least one of the following local start authorization options : C-30, C-31, C-32 - The Charging Station does NOT have a cable lock, which prevents the EV driver to connect the EV and EVSE before authorization.	NOT AQ-2 and (C-30 or C-31 or C-32)	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode
TC_E_38	EV not ready	C	M	For CS: not supporting start transaction options EnergyTransfer	NOT C-09.5 and NOT Product Subtype "Mode 1/2-only Charging Station"	Start transaction options - EnergyTransfer
TC_C_56	Authorization Unknown	C		Charging Station: - The Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-30 or C-31 or C-32	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode

					Related features	
TC_C_05	Authorization invalid - Cable lock	C		For CS: - The Charging Station has a cable lock, which prevents the EV driver to connect the EV and EVSE before authorization. - The Charging Station supports at least one of the following local start authorization options C-30, C-31, C-32, C35 - The Charging Station does NOT have the following configuration: TxStartPoint ReadOnly AND value Authorized is NOT set.	(C-30 or C-31 or C-32 or C-35) and AQ-2	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode / NoAuthorization
	Local Stop Transaction					
TC_C_04	Different idToken	C		Charging Station: - The Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-30 or C-31 or C-32	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode
TC_E_06	Accepted	C		The Charging Station supports E07 Transaction locally stopped by IdToken with at least one of the following local start authorization options: C-30, C-31, C-32, C35	C-30 or C-31 or C-32 or C35	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode / NoAuthorization
	Authorization by GroupId					
TC_C_39	Success	C	M	For CS: the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-30 or C-31 or C-32	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode
TC_C_45	Master pass - Not able to start transaction + groupId	C		For CS: the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 and Master Pass	(C-30 or C-31 or C-32) AND (C-07 OR C-08)	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode and Master Pass
TC_C_42	Not stopped by GroupId	C		For CS: the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-30 or C-31 or C-32	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode
	Offline Authorization					
TC_C_26	Unknown Id	C		If the feature Unknown Offline Authorization is supported AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-02 and (C-30 or C-31 or C-32)	Unknown Offline Authorization
	Stop Transaction with a Master Pass					
TC_C_47	With UI - All transactions	C	M	CS: If the feature Master Pass with UI is supported AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-07 and (C-30 or C-31 or C-32)	Master Pass - With UI

					Related features	
TC_C_48	With UI - With UI - Specific transactions	C	M	CS: If the feature Master Pass with UI is supported AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-07 and (C-30 or C-31 or C-32)	Master Pass - With UI
TC_C_49	Without UI	C	M	CS: If the feature Master Pass with UI is supported AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-08 and (C-30 or C-31 or C-32)	Master Pass - Without UI
	Store Authorization Data in the Authorization Cache					
TC_C_32	Persistent over reboot	C		If the Charging Station has an authorization cache, then it must support this use case AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_33	Update on AuthorizeResponse	C		If the Charging Station has an authorization cache, then it must support this use case AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_34	Update on TransactionResponse	C		If the Charging Station has an authorization cache, then it must support this use case AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_36	AuthCacheCtrlr.LocalPreAuthorize = false	C		If the Charging Station has an authorization cache and AuthCacheEnabled is implemented AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_46	AuthCacheLifeTime	C		If the Charging Station has an authorization cache, then it must support this use case AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-53 and (C-30 or C-31 or C-32)	AuthCacheLifeTime
	Clear Authorization Data in Authorization Cache					
TC_C_37	Accepted	C	M	If the Charging Station has an authorization cache, then it must support this use case AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache

					Related features	
TC_C_38	Rejected	C	M	If the Charging Station has an authorization cache and AuthCacheEnabled is implemented AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
	Authorization by GroupId					
TC_C_41	Success with Authorization Cache	C		For CS: - The Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 - If the Charging Station has an authorization cache.	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_44	Invalid status with Authorization Cache	C		For CS: - The Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 - If the Charging Station has an authorization cache.	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
	Authorization through authorization cache					
TC_C_08	Accepted	C	M	If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_09	Invalid & Not Accepted	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_12	Invalid & Accepted	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_10	Blocked	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_11	Expired	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache

					Related features	
TC_C_13	Accepted but cable not connected yet.	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_15	StopTxOnInvalidId = false, MaxEnergyOnInvalidId > 0	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 If MaxEnergyOnInvalidId is implemented.	C-49 and C-03 and (C-30 or C-31 or C-32)	Authorization Cache & MaxEnergyOnInvalidId
TC_C_16	StopTxOnInvalidId = true	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_17	StopTxOnInvalidId = false	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-49 and (C-30 or C-31 or C-32)	Authorization Cache
TC_C_18	StopTxOnInvalidId = true, MaxEnergyOnInvalidId > 0	C		If the Charging Station has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 If MaxEnergyOnInvalidId is implemented.	C-49 and C-03 and (C-30 or C-31 or C-32)	Authorization Cache & MaxEnergyOnInvalidId
TC_C_20	Invalid		M			
TC_C_57	AuthCacheDisablePostAuthorize	C		If the Charging Station supports the option for disabling remote authorization for cached invalid idTokens AND has an authorization cache AND the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32	C-59 and C-49 and (C-30 or C-31 or C-32)	
	Local start transaction - Cable plugin first					
TC_E_03	Success	C	M	Applicable if one or more of the local start authorization options is implemented.	NOT AQ-2 and (C-30 - C-35 or ISO 15118 support)	Authorization options for local start
	Local start transaction - Authorization first					
TC_E_04	Success	C	M	Applicable if one or more of the local start authorization options is implemented.	C-30 - C-35 or ISO 15118 support	Authorization options for local start
TC_E_05	Cable plugin timeout	C		Applicable if one or more of the local start authorization options is implemented.	C-30 - C-35 or ISO 15118 support	Authorization options for local start
TC_E_52	DisableRemoteAuthorization	C		If the Charging Station supports the option for disabling remote authorization	C-58	

					Related features	
	Start transaction options					
TC_E_09	EVConnected	C	M	TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EVConnected is a supported value. And it should be possible to not set ParkingBayOccupancy.	C-09.1 and (C-51 or NOT C-09.6)	
TC_E_10	Authorized - Local	C	M	TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized is a supported value. - If one or more of the local start authorization options is implemented.	C-09.2 and (C-30 - C-35 or ISO 15118 support)	Supported Transaction Start Points & Authorization options for local start & Authorization - eMAID
TC_E_13	Authorized - Remote	C		TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized is a supported value.	C-09.2	Supported Transaction Start points
TC_E_11	DataSigned	C	M	CS: TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value DataSigned is a supported value. And it should be possible to not set ParkingBayOccupancy and EVConnected and Authorized. CSMS: Must at least be able to receive a signed MeterValue. It does not need to be able to read it.	C-09.3 and (C-51 or NOT (C-09.1 or C-09.2 or C-09.6))	Supported Transaction Start points
TC_E_01	PowerPathClosed	C	M	TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value PowerPathClosed is a supported value. And it should be possible to not set ParkingBayOccupancy and EVConnected and Authorized and DataSigned.	C-09.4 and (C-51 or NOT (C-09.1 or C-09.2 or C-09.3 or C-09.6))	Supported Transaction Start points

					Related features	
TC_E_02	EnergyTransfer	C	M	TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EnergyTransfer is a supported value. And it should be possible to not set ParkingBayOccupancy and EVConnected and Authorized and DataSigned and PowerPathClosed	C-09.5 and (C-51 or NOT (C-09.1 or C-09.2 or C-09.3 or C-09.4 or C-09.6))	Supported Transaction Start points
TC_E_12	ParkingBayOccupied	C	M	TxStartPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value ParkingBayOccupied is a supported value.	C-09.6	Supported Transaction Start points
	Stop transaction options					
TC_E_14	EVDisconnected - Charging Station side	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EVConnected is a supported value. And it should be possible to not set EnergyTransfer and PowerPathClosed and Authorized. Charging Station does NOT have a fixed cable.	HFS-1 and C-10.1 and (C-52 or NOT (C-10.2 or C-10.3 or C-10.4))	Supported Transaction Stop points
TC_E_20	EVDisconnected - EV side (able to charge IEC 61851-1 EV)	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EVConnected is a supported value. And it should be possible to not set EnergyTransfer and PowerPathClosed AND The Charging Station does NOT have following configuration combination; **StopTxOnEVSideDisconnect** mutability ReadOnly with value *true* AND TxStopPoint mutability is *ReadOnly* and contains *Authorized*	C-10.1 and (C-52 or NOT (C-10.2 or C-10.3 or C-10.4)) AND NOT C-06.1) AND (AQ-9 OR Product Subtype "Mode 1/2-only Charging Station")	Supported Transaction Stop points

					Related features	
TC_E_54	EVDisconnected - EV side (not able to charge IEC 61851-1 EV)	C		TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EVConnected is a supported value. And it should be possible to not set EnergyTransfer and PowerPathClosed AND The Charging Station does NOT have following configuration combination; **StopTxOnEVSideDisconnect** mutability ReadOnly with value *true* AND TxStopPoint mutability is *ReadOnly* and contains *Authorized*	C-10.1 and (C-52 or NOT (C-10.2 or C-10.3 or C-10.4)) AND (HFS-4 OR ISO15118 support) AND NOT Product Subtype "Mode 1/2-only Charging Station"	Supported Transaction Stop points
TC_E_15	StopAuthorized - Local	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized is a supported value. The Charging Station supports E07 Transaction locally stopped by IdToken with at least one of the following local start authorization options: C-30, C-31, C-32, C35	C-10.2 and (C-30 or C-31 or C-32 or C35)	Supported Transaction Stop Points & Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode / NoAuthorization
TC_E_21	StopAuthorized - Remote	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized is a supported value.	C-10.2	Supported Transaction Stop points
TC_E_16	Deauthorized - Invalid idToken	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized or PowerPathClosed is a supported value. Charging Station: If one or more of the local start authorization options is implemented. AND either a cache, local authorization list or UnknownIdtag (C15) is implemented.	(C-10.2 or C-10.3) and (C-30 - C-35 or ISO 15118 support) and C-01	Supported Transaction Stop Points & Local Authorization options for local start & Authorization - eMAID
TC_E_17	Deauthorized - EV side disconnect	C	M	- TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized or PowerPathClosed is a supported value. - StopTxOnEVSideDisconnect needs to ReadWrite or ReadOnly with value true	(C-10.2 or C-10.3) and C-06.2 and AQ-9	Supported Transaction Stop points

					Related features	
TC_E_39	Deauthorized - timeout	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value Authorized is a supported value.	C-10.2	Supported Transaction Stop points
TC_E_07	PowerPathClosed - Local stop	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value PowerPathClosed is a supported value. And it should be possible to not set Authorized. The Charging Station supports E07 Transaction locally stopped by IdToken with at least one of the following local start authorization options: C-30, C-31, C-32, C35	C-10.3 and (C-52 or NOT C-10.2) and (C-30 or C-31 or C-32 or C35)	Supported Transaction Stop Points & Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode / NoAuthorization
TC_E_35	PowerPathClosed - Remote stop	C		TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value PowerPathClosed is a supported value. And it should be possible to not set Authorized.	C-10.3 and (C-52 or NOT C-10.2)	Supported Transaction Stop points
TC_E_37	PowerPathClosed - EV side disconnect	C		TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value PowerPathClosed is a supported value. And it should be possible to not set EnergyTransfer and EVConnected.	C-10.3 and (C-52 or NOT (C-10.1 or C-10.4)) AND (AQ-9 OR Product Subtype "Mode 1/2-only Charging Station")	Supported Transaction Stop points
TC_E_08	EnergyTransfer stopped - StopAuthorized	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EnergyTransfer is a supported value. And it should be possible to not set PowerPathClosed and Authorized.	C-10.4 and (C-52 or NOT (C-10.2 or C-10.3))	Supported Transaction Stop points
TC_E_22	EnergyTransfer stopped - SuspendedEV	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value EnergyTransfer is a supported value.	C-10.4	Supported Transaction Stop points

					Related features	
TC_E_19	ParkingBayUnoccupied	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value ParkingBayOccupancy is a supported value. And it should be possible to not set EnergyTransfer and Authorized and PowerPathClosed and EVConnected.	C-10.5 and (C-52 or NOT (C-10.1 or C-10.2 or C-10.3 or C-10.4))	Supported Transaction Stop points
	Disconnect cable on EV-side					
TC_E_24	Deauthorize transaction - UnlockOnEVSideDisconnect is true	C		The Charging Station does NOT have a permanently attached cable. UnlockOnEVSideDisconnect can be set to true StopTxOnEVSideDisconnect can be set to true	HFS-1 and C-06.2 and C-12.1 and AQ-9 and NOT Product Subtype "Mode 1/2-only Charging Station"	Support for not maintaining authorization when cable disconnected on EV side & Support for unlocking connector when cable disconnected on EV side
TC_E_25	Deauthorize transaction - UnlockOnEVSideDisconnect is false	C		UnlockOnEVSideDisconnect can be set to false StopTxOnEVSideDisconnect can be set to true	C-06.2 and C-12.2 and (AQ-9 OR Product Subtype "Mode 1/2-only Charging Station")	Support for not maintaining authorization when cable disconnected on EV side & Support for not unlocking connector when cable disconnected on EV side
TC_E_26	Suspend transaction	C	M	TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value ParkingBayOccupancy or Authorized is a supported value. And it should be possible to not set EnergyTransfer and PowerPathClosed and EVConnected. UnlockOnEVSideDisconnect can be set to false StopTxOnEVSideDisconnect can be set to false	(C-10.2 or C-10.5) and (C-52 or NOT (C-10.1 or C-10.3 or C-10.4)) and C-06.1 and C-12.2 and AQ-9 and NOT Product Subtype "Mode 1/2-only Charging Station"	
TC_E_27	Suspend transaction - Fixed cable connection timeout	C		TxStopPoint can either be ReadOnly with a subset of the values or have a valueList of supported values, that contains a subset. This testcase is applicable if the value ParkingBayOccupancy or Authorized is a supported value. And it should be possible to not set EnergyTransfer and PowerPathClosed and EVConnected. The Charging Station has a permanently attached cable at the Charging Station side. UnlockOnEVSideDisconnect can be set to false StopTxOnEVSideDisconnect can be set to false	(C-10.2 or C-10.5) and (C-52 or NOT (C-10.1 or C-10.3 or C-10.4)) and C-06.1 and C-12.2 and HFS-2 and AQ-9 and NOT Product Subtype "Mode 1/2-only Charging Station"	

					Related features	
	Retry sending transaction message when failed					
TC_E_41	Max retry count reached	M				
TC_E_42	Success before reaching the max retry count	M				
TC_E_50	Max retry count reached - CallError	M				
TC_E_51	Success before reaching the max retry count - CallError	M				
	Offline Behaviour					
TC_E_40	Connection loss during transaction	M				
TC_E_43	Transaction during offline period	C		Charging Station: If one or more of the local start authorization options is implemented.	C-01 and (C-30 - C-35 or ISO 15118 support)	Offline transaction support & Local Authorization options for local start
TC_E_44	Stop transaction during offline period	C		Charging Station: If one or more of the local start authorization options is implemented.	C-01 and (C-30 - C-35 or ISO 15118 support)	Offline transaction support & Local Authorization options for local start & Authorization - eMAID
TC_E_45	Stop transaction during offline period - Same GroupId	C		For CS: the Charging Station supports at least one of the following local start authorization options: C-30, C-31, C-32 and Local Authorization List or Authorization Cache	(C-30 or C-31 or C-32) AND (Local Authorization List Management or C-49)	Local Authorization - using RFID ISO14443 / RFID ISO15693 / KeyCode and Local Authorization List or Authorization Cache
	Check Transaction status					
TC_E_28	TransactionId unknown	M				
TC_E_29	Transaction with id ongoing - with message in queue	M	C		C-16	Check TransactionStatus
TC_E_30	Transaction with id ongoing - without message in queue	M	C		C-16	Check TransactionStatus
TC_E_31	Transaction with id ended - with message in queue	M	C		C-16	Check TransactionStatus
TC_E_32	Transaction with id ended - without message in queue	M				
TC_E_33	Without transactionId - with message in queue	M	C		C-16	Check TransactionStatus
TC_E_34	Without transactionId - without message in queue	M	C		C-16	Check TransactionStatus
	Reset Sequence Number					
TC_E_53	CSMS accepting *seqNo* = 0 at start of transaction		M			
	Remote start transaction					
TC_F_01	Cable plugin first	C	M	If the Charging Station does not have a cable lock.	NOT AQ-2 and (C-36 -(or) C-39)	Authorization options for remote start

					Related features	
TC_F_02	Remote start first - AuthorizeRemoteStart is true	C	M	If AuthorizeRemoteStart can be set to true	C-48.1 and (C-36 -(or) C-39)	Authorization options for remote start
TC_F_03	Remote start first - AuthorizeRemoteStart is false	C	M	If AuthorizeRemoteStart can be set to false	C-48.2 and (C-36 -(or) C-39)	Authorization options for remote start
TC_F_04	Remote start first - Cable plugin timeout	M	M			
	Remote stop transaction					
TC_F_08	Success	M				
TC_F_09	Rejected	M				
	Remote unlock Connector					
TC_F_05	With ongoing transaction	C		If the Charging Station has a detachable cable.	HFS-1 and NOT Product Subtype "Mode 1/2-only Charging Station"	
TC_F_06	Without ongoing transaction - Accepted	HFS-1 and NOT Product Subtype "Mode 1/2-only Charging Station"	C-11	If the Charging Station has a detachable cable. If the CSMS support the Unlocking connector for Charging Station with detachable cable (UnlockConnector) feature.	See column 3/4	
TC_F_07	Without ongoing transaction - No cable connected	C		If the Charging Station has a detachable cable.	HFS-1 and NOT Product Subtype "Mode 1/2-only Charging Station"	
TC_F_10	Without ongoing transaction - UnknownConnector	C		If the Charging Station has a detachable cable.	HFS-1 and NOT Product Subtype "Mode 1/2-only Charging Station"	
	Trigger message					
TC_F_11	MeterValues - Specific EVSE	C	C	If the SUT supports TriggerMessage for requestedMessage MeterValues for a specific EVSE.	C-29.1	TriggerMessage
TC_F_12	MeterValues - All EVSE	C	C	If the SUT supports TriggerMessage for requestedMessage MeterValues for a all EVSE.	C-29.1	TriggerMessage
TC_F_13	TransactionEvent - Specific EVSE	C	C	If the SUT supports TriggerMessage for requestedMessage TransactionEvent for a specific EVSE.	C-29.2	TriggerMessage

					Related features	
TC_F_14	TransactionEvent - All EVSE	C	C	If the SUT supports TriggerMessage for requestedMessage TransactionEvent for a all EVSE.	C-29.2	TriggerMessage
TC_F_15	LogStatusNotification - Idle	C	C	If the SUT supports TriggerMessage for requestedMessage LogStatusNotification.	C-29.3	TriggerMessage
TC_F_16	LogStatusNotification - Uploading	C		If the Charging Station supports TriggerMessage for requestedMessage LogStatusNotification.	C-29.3	TriggerMessage
TC_F_17	FirmwareStatusNotification - Specific EVSE not relevant	C		If the Charging Station supports TriggerMessage for requestedMessage FirmwareStatusNotification.	C-29.4	TriggerMessage
TC_F_18	FirmwareStatusNotification - Idle	C	C	If the SUT supports TriggerMessage for requestedMessage FirmwareStatusNotification.	C-29.4	TriggerMessage
TC_F_19	FirmwareStatusNotification - Downloading	C		If the Charging Station supports TriggerMessage for requestedMessage FirmwareStatusNotification.	C-29.4	TriggerMessage
TC_F_20	Heartbeat	M	M			
TC_F_23	StatusNotification - Specific EVSE - Available	C	C	If the SUT supports TriggerMessage for requestedMessage StatusNotification for a specific EVSE.	C-29.5	TriggerMessage
TC_F_24	StatusNotification - Specific EVSE - Occupied	C	C	If the SUT supports TriggerMessage for requestedMessage StatusNotification for a specific EVSE.	C-29.5	TriggerMessage
TC_F_26	BootNotification - Rejected	C		If the Charging Station supports TriggerMessage for requestedMessage BootNotification.	C-29.6	TriggerMessage
TC_F_27	NotImplemented	C	M	For CS: can only be done when SignCombinedCertificate is notimplemented	NOT ISO-3	
	Connector status Notification			Charging Station: This can either be implemented with the StatusNotification or NotifyEvent message. CSMS: Both StatusNotification and NotifyEvent must be supported.		
TC_G_01	Available to Occupied	M				
TC_G_02	Occupied to Available	M				
TC_G_20	Lock Failure		M			

					Related features	
	Change Availability EVSE			Charging Station: This can either be implemented with the StatusNotification or NotifyEvent message. CSMS: Both StatusNotification and NotifyEvent must be supported.		
TC_G_03	Operative to inoperative	M	M			
TC_G_09	Operative to operative	M				
TC_G_04	Inoperative to operative	M	M			
TC_G_10	Inoperative to inoperative	M				
TC_G_11	With ongoing transaction	M	M			
TC_G_18	state persists across reboot	M				
	Change Availability Charging Station			Charging Station: This can either be implemented with the StatusNotification or NotifyEvent message. CSMS: Both StatusNotification and NotifyEvent must be supported.		
TC_G_05	Operative to inoperative	M	M			
TC_G_12	Operative to operative	M				
TC_G_06	Inoperative to operative	M	M			
TC_G_13	Inoperative to inoperative	M				
TC_G_21	state persists across reboot	M				
TC_G_14	With ongoing transaction	M	M			
	Change Availability Connector			Charging Station: This can either be implemented with the StatusNotification or NotifyEvent message. CSMS: Both StatusNotification and NotifyEvent must be supported.		
TC_G_07	Operative to inoperative	M	M			
TC_G_15	Operative to operative	M				
TC_G_08	Inoperative to operative	M	M			
TC_G_16	Inoperative to inoperative	M				
TC_G_17	With ongoing transaction	M	M			
TC_G_19	state persists across reboot	M				

					Related features	
	Clock-aligned Meter Values			Charging Station can choose which measurands are supported (At least one). This can either be implemented with the MeterValues or NotifyEvent message.		
TC_J_01	No transaction ongoing	M	M		C-40	Supported MeterValue Measurands
TC_J_02	Transaction ongoing	M	M		C-40	Supported MeterValue Measurands
TC_J_03	EventType Ended	M	M		C-40	Supported MeterValue Measurands
TC_J_04	Signed	C	M	Charging Station: If signed MeterValues is implemented CSMS: Must at least be able to receive a signed MeterValue. It does not need to be able to read it.	C-40 and C-42	Supported MeterValue Measurands & Signed Metervalues
TC_J_06	No Meter Values during transaction	C		If AlignedDataSendDuringIdle is supported.	C-28	AlignedDataSendDuringIdle
	Sampled Meter Values			Charging Station can choose which measurands are supported (At least one).		
TC_J_07	EventType Started - EVSE known	M	M		C-40	Supported MeterValue Measurands
TC_J_08	Context Transaction.Begin - EVSE not known	C	M		C-40 and NOT AQ-8 AND (C-09.2 OR C-09.6)	Supported MeterValue Measurands & possibility to enforce EVSE being known.
TC_J_09	EventType Updated	M	M		C-40	Supported MeterValue Measurands
TC_J_10	EventType Ended	M	M		C-40	Supported MeterValue Measurands
TC_J_11	Signed	C	M	Charging Station: If signed MeterValues is implemented CSMS: Must at least be able to receive a signed MeterValue. It does not need to be able to read it.	C-42	Supported MeterValue Measurands & Signed Metervalues
	Remote start transaction with charging profile					
TC_K_38	Ignore chargingProfile	C		The Charging Station does NOT support Smart Charging.	NOT Smart Charging	
	Secure Firmware Update					
TC_L_01	Installation successful	M	M			
TC_L_02	InstallScheduled	M	C		C-15	Scheduled firmware updates
TC_L_03	DownloadScheduled	M	C		C-15	Scheduled firmware updates
TC_L_04	RevokedCertificate		M			
TC_L_05	InvalidCertificate	M	M			
TC_L_06	InvalidSignature	M	M			
TC_L_07	DownloadFailed	M	M			

					Related features	
TC_L_08	InstallVerificationFailed or InstallationFailed	M	M			
TC_L_09	InstallationFailed		M			
TC_L_10	AcceptedCanceled	C	M	The Charging Station supports cancellling an ongoing firmware update	C-60	
TC_L_11	Unable to cancel	C	M	The Charging Station does NOT supports cancellling an ongoing firmware update	NOT C-60	
TC_L_18	Missing firmware signing certificate and signature	M				
TC_L_12	Unable to download/install firmware with ongoing transaction - AllowNewSessionsPendingFirmwareUpdate is true	C		AllowNewSessionsPendingFirmwareUpdate is implemented. The Charging Station is unable to download AND install firmware while there is an ongoing transaction.	C-20 and NOT C-43 and NOT AQ-7 and HFS-8 > 1	AllowNewSessionsPendingFirmwareUpdate
TC_L_13	Unable to download/install firmware with ongoing transaction - AllowNewSessionsPendingFirmwareUpdate is false	C	M	AllowNewSessionsPendingFirmwareUpdate is implemented. The Charging Station is unable to download AND install firmware while there is an ongoing transaction.	NOT C-43 and NOT AQ-7	
TC_L_14	Unable to install firmware with ongoing transaction - AllowNewSessionsPendingFirmwareUpdate is true	C		AllowNewSessionsPendingFirmwareUpdate is implemented. The Charging Station is unable to install firmware while there is an ongoing transaction	C-20 and NOT C-43 and AQ-7 and HFS-8 > 1	AllowNewSessionsPendingFirmwareUpdate
TC_L_15	Unable to install firmware with ongoing transaction - AllowNewSessionsPendingFirmwareUpdate is false	C		AllowNewSessionsPendingFirmwareUpdate is implemented. The Charging Station is unable to install firmware while there is an ongoing transaction	NOT C-43 and AQ-7	
TC_L_16	Able to update firmware with ongoing transaction	C		If the Charging Station supports Install Firmware with ongoing transaction(s)	C-43	Install Firmware with ongoing transaction(s)
	Retrieve certificates from Charging Station					
TC_M_12	CSMSRootCertificate	M				
TC_M_13	ManufacturerRootCertificate	M	M			
TC_M_17	CSMSRootCertificate & ManufacturerRootCertificate	M				
TC_M_18	All certificateTypes	M	M			
TC_M_19	No matching certificate found	M	M			
	Delete a certificate from a Charging Station					
TC_M_20	Success	M	M			
TC_M_21	Failed		M			

					Related features	
TC_M_22	No matching certificate found	M				
TC_M_23	Unable to delete the Charging Station Certificate	M				
	Install CA certificate					
TC_M_01	CSMSRootCertificate	M	M			
TC_M_02	ManufacturerRootCertificate	M	M			
TC_M_05	Failed		M			
TC_M_07	Rejected - Certificate invalid	M				
TC_M_09	AdditionalRootCertificateCheck - Rejected	C		If the Charging Station supports AdditionalRootCertificateCheck with value true	AS-2	Additional Root Certificate check mechanism implemented
TC_M_30	AdditionalRootCertificateCheck - Reconnect using new CSMS Root - Success	C		If the Charging Station supports AdditionalRootCertificateCheck with value true	AS-2	Additional Root Certificate check mechanism implemented
TC_M_31	AdditionalRootCertificateCheck - Reconnect using new CSMS Root - Fallback mechanism	C		If the Charging Station supports AdditionalRootCertificateCheck with value true	AS-2	Additional Root Certificate check mechanism implemented
	Retrieve Log Information					
TC_N_25	Diagnostics Log - Success	M	M			
TC_N_34	Rejected		M			
TC_N_26	Diagnostics Log - Upload failed	M				
TC_N_35	Security Log - Success	M	M			
TC_N_36	Second Request	C	M	If the Charging Station is able to cancel an ongoing log file upload.	C-57	
	Get Customer Information					
TC_N_27	Accepted + data	C	M	For CS: The Charging Station needs to support Local Authorization and either the Local Authorization List or Authorization Cache. IdToken is used as customer information.	(C-30 or C-31 or C-34) and (Local Authorization List Management or C-49)	
TC_N_28	Accepted + no data	C	M	For CS: The Charging Station needs to support Local Authorization and either the Local Authorization List or Authorization Cache. IdToken is used as customer information.	(C-30 or C-31 or C-34) and (Local Authorization List Management or C-49)	
TC_N_29	Not Accepted		M			
	Clear Customer Information					
TC_N_30	Clear and report + data	C	M	For CS: The Charging Station needs to support Local Authorization or the Authorization Cache. IdToken is used as customer information.	(C-30 or C-31 or C-34) and (Local Authorization List Management or C-49)	

					Related features	
TC_N_31	Clear and report + no data	C	M	For CS: The Charging Station needs to support Local Authorization or the Authorization Cache. IdToken is used as customer information.	(C-30 or C-31 or C-34) and (Local Authorization List Management or C-49)	
TC_N_32	Clear and no report	M	M			
TC_N_62	Clear and report - customerIdentifier	C	C	Support for retrieving / deleting CustomerInformation - CustomerIdentifier	C-14	
	Data Transfer to the Charging Station					
TC_P_01	Rejected / Unknown VendorId / Unknown MessageId	M		Charging Station must be able to Reject the message.		
	Data Transfer to the CSMS					
TC_P_02	Rejected / Unknown VendorId / Unknown MessageId		M	CSMS must be able to Reject the message.		
	CustomData					
TC_P_03	Receive custom data	M	M			

4.3. Test Cases Advanced Security

					Related features	
OCTT Id	**OCPP Compliance Testing Tool scenario**	**Conf. Test for Charging Station**	**Conf. test for CSMS**	**Condition / remark**	**Feature no.**	**Feature**
	TLS - Client-side certificate					
TC_A_07	valid certificate	M	M			
TC_A_08	Invalid certificate		M			
	Update Charging Station Certificate by request of CSMS					
TC_A_11	Success - Charging Station Certificate	M	M			
TC_A_14	Invalid certificate	M	M			
TC_A_15	SignCertificateRequest Rejected	M				
TC_A_23	CertificateSignedRequest Timeout	C		If the Charging Station supports CertificateSignedRequest Timeout	AS-3	
	Upgrade Charging Station Security Profile					
TC_A_21	No valid ChargingStationCertificate installed	C		If the last ChargingStationCertificate can be removed (Via other means than OCPP).	AQ-1	

4.4. Test Cases Local Authorization List Management

List will become available in a later version of this document.

4.5. Test Cases Smart Charging

List will become available in a later version of this document.

4.6. Test Cases Advanced Device Management

List will become available in a later version of this document.

4.7. Test Cases Reservation

List will become available in a later version of this document.

4.8. Test Cases Advanced User Interface

List will become available in a later version of this document.

4.9. Test Cases ISO 15118 Support

List will become available in a later version of this document.

5. OCPP 2.0.1 Mandatory Controller components per profile

Controller components contain variables that describe the supported features of a Charging Station and influence its behavior. In OCPP 2.0.1 we have configuration variables that are required or optional, but these are contained by controller components. Functionalities cannot be tested without the accompanying controller component, so for certification the following controller components are mandatory:

Certification Profile	Description
Core	OCPPCommCtrlr TxCtrlr DeviceDataCtrlr ClockCtrlr SecurityCtrlr SampledDataCtrlr AlignedDataCtrlr AuthCtrlr
Advanced Security	SecurityCtrlr (already part of Core)
Smart Charging	SmartChargingCtrlr
ISO 15118 Support	ISO15118Ctrlr SmartChargingCtrlr
Advanced Diagnostics	MonitoringCtrlr
Local Authorization List Management	LocalAuthListCtrlr
Advanced UI	TariffCostCtrlr DisplayMessageCtrlr
Reservation	ReservationCtrlr

6. Appendix A: additional questions for the Protocol Implementation Conformance Statement

To perform the certification testing, the test lab need some additional information (for the test selection). This concerns the following questions:

6.1. Questions for Charging Stations

Id	Additional questions for lab testing
AQ-1	Can the last CSMSRootCertificate be removed?
AQ-2	Does the Charging Station have a cable lock, which prevents the EV driver to connect the EV and EVSE before authorization?
AQ-3	Can the last ChargingStationCertificate be removed (via other means than OCPP)?
AQ-4	Is there at least one unsupported NumberOfPhases?
AQ-5	Does the Charging Station have at least one hardWired monitor? If yes, which hardWired monitor should be used for the certification test
AQ-6	Does the Charging Station have a pre-configured monitor? If yes, which pre-configured monitor should be used for the certification test
AQ-7	Is your Charging Station able to download firmware while there is an ongoing transaction?
AQ-8	Does your Charging Station enforce a selection of EVSE (by design) prior to authorization?
AQ-9	Does your Charging Station support charging an EV using IEC 61851-1 (Mode 3)?

6.2. Questions for CSMSs

Id	Additional questions for lab testing
AQ-1	Can your CSMS be configured to first respond to a BootNotificationRequest with status Pending or Rejected?
AQ-2	Is a FullInventory requested during onboarding / booting test cases?
AQ-6	Does the CSMS reject unknown Charging Stations during websocket connection setup?

7. Appendix B: Hardware feature set

The table below gives an overview of the hardware feature set Ids that are used for determining whether test cases are needed / applicable for certification.

Table 4. Hardware features

Id	Hardware Feature
HFS-1	Charging Station has a detachable cable
HFS-2	Charging Station has a fixed cable
HFS-3	Charging Station has AC support
HFS-4	Charging Station has DC support
HFS-5	Charging Station has 1 phase support
HFS-6	Charging Station has 2 phase support
HFS-7	Charging Station has 3 phase support
HFS-8	No. EVSEs of Charging Station

8. Appendix C: Features vs. OCPP use cases

The table below gives an overview of the use cases / configuration variables that the features are applicable for / referring to in the OCPP 2.0.1 Specificiation Part 2.

Table 5. Optional features vs. related use cases

Id	Feature	Related use cases
Core		
C-01	Support for offline authorization of transactions	C15, C10, C11, C12
C-02	Support for allowing Offline Authorization for Unknown Ids (OfflineTxForUnknownIdEnabled)	C15
C-03	Support for maximizing energy for invalid ids (MaxEnergyOnInvalidId)	C15, E05
C-04	Support to limit StatusNotifications (MinimumStatusDuration)	Configuration Variable for G01
C-05	Support for changing WebSocketPingInterval (WebSocketPingInterval)	Configuration Variable related (B05, B06)
C-06	Authorization status after cable disconnected on EV side (StopTxOnEVSideDisconnect)	
C-06.1	Support for maintaining authorization when cable disconnected on EV side	E10
C-06.2	Support for not maintaining authorization when cable disconnected on EV side	E09
C-07	Support for using a Master Pass for charging stations with UI (MasterPassGroupId)	C16
C-08	Support for using a Master Pass for charging stations without UI (MasterPassGroupId)	C16
C-09	Supported Transaction Start points (TxStartPoint)	E01
C-09.1	Start transaction options - EVConnected	E01-S2
C-09.2	Start transaction options - Authorized	E01-S3
C-09.3	Start transaction options - DataSigned	E01-S4
C-09.4	Start transaction options - PowerPathClosed	E01-S5
C-09.5	Start transaction options - EnergyTransfer	E01-S6
C-09.6	Start transaction options - ParkingBayOccupancy	E01-S1
C-10	Supported Transaction Stop points (TxStopPoint)	E06
C-10.1	Stop transaction options - EVConnected	E06-S2
C-10.2	Stop transaction options - Authorized	E06-S3
C-10.3	Stop transaction options - PowerPathClosed	E06-S5
C-10.4	Stop transaction options - EnergyTransfer	E06-S6
C-10.5	Stop transaction options - ParkingBayOccupancy	E06-S1
C-12	Unlocking of connector when cable disconnected on EV side (UnlockOnEVSideDisconnect)	E09, E10
C-12.1	Support for unlocking connector when cable disconnected on EV side	E09, E10
C-12.2	Support for not unlocking when cable disconnected on EV side	E09, E10
C-13	Support for Reset per EVSE (AllowReset)	B11, B12
C-14	Support for retrieving / deleting CustomerInformation - CustomerIdentifier	N09, N10
C-20	Allowing New Sessions Pending a FirmwareUpdate (AllowNewSessionsPendingFirmwareUpdate)	Configuration Variable for L01
C-21	Support for queuing all or only Transaction related messages until they are delivered to the CSMS (QueueAllMessages)	Optional
Time related settings		
C-23	Supported time sources (TimeSource)	
C-25	Support for setting a TimeOffset (TimeOffset)	Configuration Variable (B05, B06)
C-26	Support for setting the TimeZone (TimeZone)	Configuration Variable (B05, B06)
C-28	Toggle sending clock aligned meter values when a transaction is ongoing / Idle (AlignedDataSendDuringIdle)	Configuration Variable for J01
C-29	TriggerMessage	F06

Id	Feature	Related use cases
C-29.1	Trigger message - MeterValues	F06
C-29.2	Trigger message - TransactionEvent	F06
C-29.3	Trigger message - LogStatusNotification	F06
C-29.4	Trigger message - FirmwareStatusNotification	F06
C-29.5	Trigger message - StatusNotification	F06
C-29.6	Trigger message - BootNotification	F06
Authorization options for local start		
C-30	Authorization - using RFID ISO14443	C01
C-31	Authorization - using RFID ISO15693	C01
C-32	Authorization - using KeyCode	C04
C-33	Authorization - using locally generated id	C06
C-34	Authorization - MacAddress	C06
C-35	Authorization - NoAuthorization	C02
Authorization options for remote start (mandatory to support at least one)		
C-36	Authorization - using RFID ISO14443	C01
C-37	Authorization - using RFID ISO15693	C01
C-38	Authorization - using centrally, in the CSMS (or other server) generated id	C05
C-39	Authorization - NoAuthorization	C02
C-40	Supported MeterValue Measurands (SampledDataTx{Started,Updated,Ended}Measurands, AlignedDataMeasurands)	J01, J02
C-41	Supported Cipher Suites	See requirement A00.FR.318, A00.FR.319, A00.FR.421, A00.FR.422
C-42	Signed Metervalues (SampledDataSignReadings)	J01, J02
C-43	Install Firmware with ongoing transaction(s) (AllowNewSessionsPendingFirmwareUpdate)	Configuration Variable for L01
C-47	Support for falling back to default OCPP reconnection mechanism when NetworkConnection profile connection has failed	B10 (FR.07)
C-48	Authorization of remote start (AuthorizeRemoteStart)	F01, F02
C-48.1	Option for authorization in case of a remote start	F01, F02
C-48.2	Option for no authorization in case of a remote start	F01, F02
C-58	Option for disabling remote authorization (DisableRemoteAuthorization)	Configuration Variable (B05, B06)
C-49	Authorization Cache (AuthCacheEnabled)	C10, C11, C12
C-59	Option for disabling remote authorization for cached invalid idTokens (AuthCacheDisablePostAuthorize)	Configuration Variable for C10, C12
C-51	Configurable TxStartPoint	Configuration Variable for E01
C-52	Configurable TxStopPoint	Configuration Variable for E06
C-53	Support for lifetime cached token (AuthCacheLifeTime)	Configuration Variable for C10
C-54	Supported policies for replacing cached entries (AuthCachePolicy)	Configuration Variable for C10, C11, C12
C-56	Support for providing the SummaryInventory	B07
C-57	Support for cancelling ongoing log file upload	N01 (AcceptedCanceled)
C-60	Support for cancelling ongoing firmware update	L01, L02 (AcceptedCanceled)
Advanced Security		
AS-2	Additional root certificate check mechanism implemented (AdditionalRootCertificateCheck)	Configuration Variable for M05
AS-3	Update Charging Station Certificate - CertificateSignedRequest Timeout (CertSigningWaitMinimum,CertSigningRepeatTimes)	Configuration Variable for A02, A03