

EVSE ComboCS4M - CCS simulation



Accelerate and make CCS developments more reliable

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Version: 5



TRIALOG is working on EV charge since more than 10 years and had several opportunities to develop a strong expertise on EV charge protocols like IEC 61851, DIN 70121, ISO 15118 and OCPP1.6/2.0.

In this context, *TRIALOG* has developed several testing and validation tools.

ComboCS4M, the EVSE CCS simulator is one of these tools. It could be used in any setup in needs of a CCS EVSE implementation. For example to simplify CCS end of line validation and maintenance by providing quick test means for DIN 70121 and ISO 15118 protocols without any power transfer.

Technical Details

- Size: 160 x 125 x 52 mm
- Connectors:
 - Power supply: barrel jack
 - Control Pilot and Protective Earth: BNC
 - CAN: DB9 (*reserved for future usage or specific development*)
 - 6 GPIO: AWHW 10G-0202-T (*reserved for power transfer add-on or specific development*)
- Interface
 - WiFi hotspot
 - Ethernet

Supported Features

ComboCS4M could be used in any setup in needs of a CCS EVSE implementation. For example, to validate the correct behaviour of a CCS vehicle or of an SECC for AC or DC, ISO 15118 or DIN 70121 communications, including the HPGP PLC and IEC 61851-1 communications. The goal of ComboCS4M is not to entirely check the vehicle CCS implementation¹, but to verify that the building process, installation operation or maintenance operation leads to a properly working device.

Auto Mode - Verify expected behaviour

In auto mode, once plugged to an EV or an EVCC, the ComboCS4M is starting a DIN 70121 and an ISO 15118 (optional) test suite.

The test suite can be quickly described as below:

- Do the SLAC mechanism

¹ Do you know ComboCS? It is done for that purpose! If you are interested, please contact us at contact@trialog.com.

- Select the DIN 70121 version: the EVSE ComboCS4M is supporting only DIN 70121, and DIN 70121 is expected to start
- Once charging loop is reached, wait 15s before to request to stop
- At the end of the charge, simulate an unplugged wire and wait 7s
- Simulate a plugged wire and do the SLAC mechanism
- Select DIN 70121 or ISO 15118: the EVSE ComboCS4M is supporting ISO 15118 and DIN 70121, ISO 15118 is expected to start, but DIN 70121 is also accepted
- Once charging loop is reached, wait 15s before to request to stop
- At the end of the charge, simulate an unplugged wire

Manual Mode – Simulate an EVSE

In manual mode, once plugged to an EV or an EVCC, the ComboCS4M is simply starting a DIN 70121 or ISO 15118 communication session.

Quick access to test result

On the ComboCS4M box, LEDs are indicating the progress of the charging session and the test suite result. It allows to visualize where it fails in case of failure.



Figure 1: ComboCS4M showing charging session progress

Quick access to test results history

The ComboCS4M is provided with a Wifi hotspot and an Ethernet plug allowing to access a result UI and to download a CSV file listing all test suites passed by the tool. The listing contains: Date, EV @MAC, SessionId, Test Result OK/NOK, Error Code.

Test Results - EVSE ComboCS4M

Download results [CSV] Purge results Download logs

#	Time	EV MAC	EVCCID	Runid	SessionId	Result	Last message	Last stage	LED	Error code
1	1587650114	0001870564de	0001870564df	1341917951	DIN c6dc8d69b37f680	Success	SessionStopRes	Finished	*●●●●●	No error
2	1587650158	0001870564de	0001870564df	2103066586	DIN 307318b2dc503402	Success	SessionStopRes	Finished	*●●●●●	No error
3	1587650941	000000000000		2116314582		Failure	None	Waiting PLC	○*○○○*	Cable unplug during session
4	1587650987	000000000000		1550997892		Failure	None	Waiting PLC	○*○○○*	Cable unplug during session
5	1587651038	0001870564de	0001870564df	2111408007	DIN dcc7a1fc7e6542fa	Success	SessionStopRes	Finished	*●●●●●	No error

Figure 2: ComboCS4M test result UI

OCPP Add-on

ComboCS4M can be provided with an optional OCPP add-on. On the ComboCS4M configuration UI:

- Select the OCPP version to be run: OCPP 1.6 or OCPP 2.0.1
- Configure the CSMS endpoint
- Enable or disable the ComboCS4M client certificate
- Enable or disable the CombocS4M basic authentication

The OCPP supervision UI of the ComboCS4M allows to access:

- Connexion state to the CSMS
- EVSE state (Available, Charging, etc)
- Name of the last message exchanged with the CSMS

The OCPP 1.6 version has been tested with several CSMS implementations and supports:

Functional Block	Coverage	Details
HTTP/SOAP		Not supported. Not planned.
WebSocket/JSON	100%	
Core	100%	
Firmware Management		Planned. <i>Message will be exchanged but no firmware update will be done.</i>
Local Auth List Management	100%	

Reservation	100%	
SmartCharging	90%	<i>ChargingProfile structure is complex and some corner cases may be still missing.</i>
Remote Trigger	100%	

The OCPP 2.0 version has been tested with several CSMS implementations, especially during 4 OCPP 2.0 Plugfest, and supports:

Functional Block	Coverage	Details
WebSocket/JSON	100%	
A. Security	75%	A01-03
B. Provisioning	66%	B01-B06 and B11-B12
C. Authorization	100%	
D. Local Auth List Management	100%	
E. Transactions	100%	
F. RemoteControl	90%	Planned. <i>E14 missing.</i>
G. Availability	100%	
H. Reservation	100%	
I. TariffAndCost		Planned.
J. MeterValues	100%	J01-J02 <i>J03 is not usable as defined in OCPP</i>
K. SmartCharging	70%	K01-K10, K15-17 <i>ChargingProfile structure is complex and some corner cases may be still missing.</i>
L. FirmwareManagement		Planned. <i>Message will be exchanged but no firmware update will be done.</i>
M. ISO 15118 CertificateManagement	100%	
N. Diagnostics	5%	N01 planned.
O. DisplayMessage		Not planned.
P. DataTransfer	100%	

Contact us

For more information about **ComboCS4M**, please contact us: contact@trialog.com.