comemso
your partner for complex embedded solutions

EV CHARGING ANALYZER/SIMULATOR (AC/DC-CCS)

Generation 5

SUPPORTED AND TESTABLE STANDARDS

DIN IEC ISO SAE GB (AC)

MEMBER OF

electric mobility south-west

CHARIN

FUNDED BY

Federal Ministry of Education and Research

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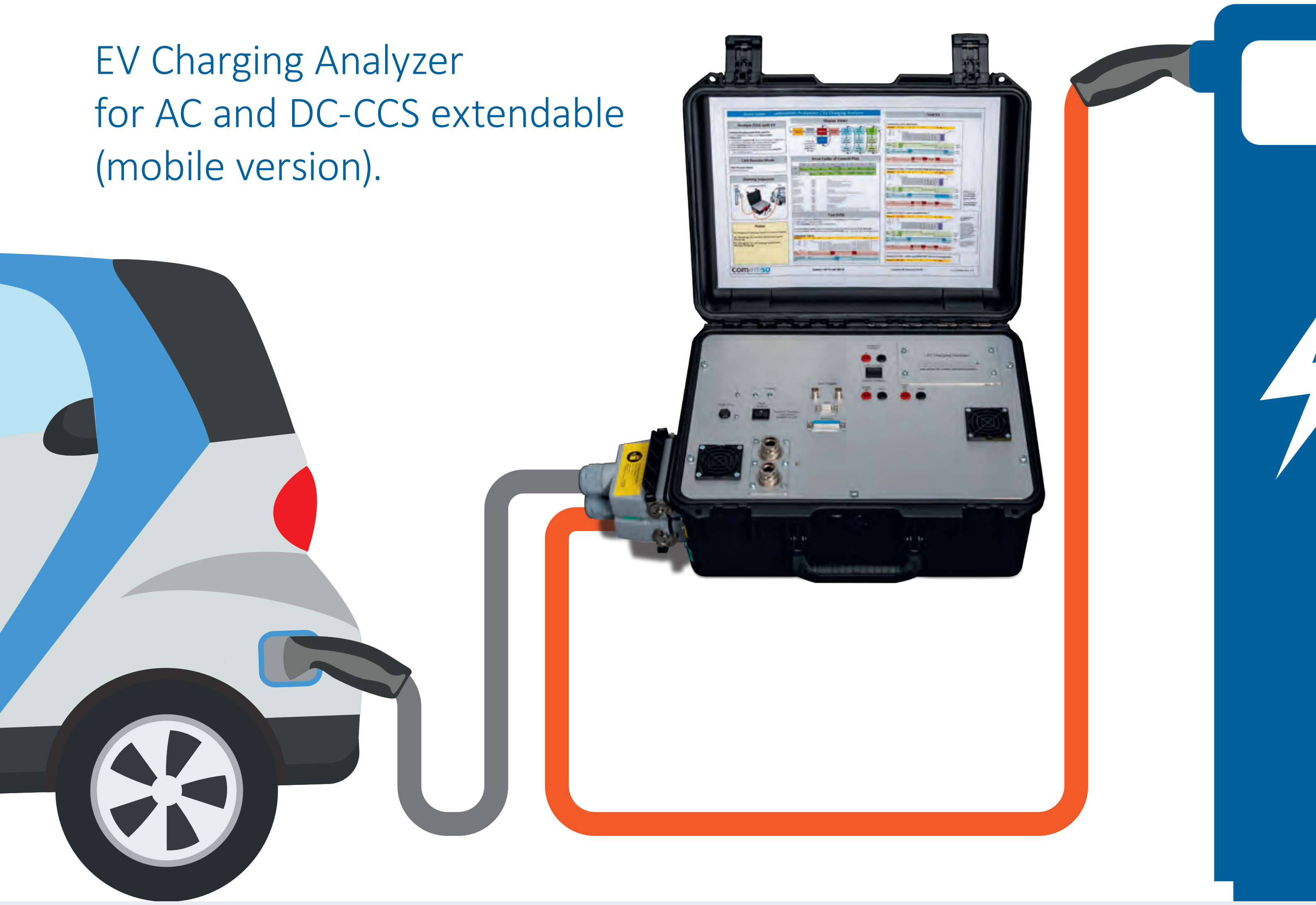
The EV Charging Analyzer is the technical standard in the analysis of the e-mobility charging process.

Analysis according to AC: IEC 61851-1, SAE J1772 and GB/T 18487.1-2015 Annex A (AC) and DC: IEC 61851-1, DIN 70121, ISO 15118, SAE J1772 and IEC 61851-23 Annex CC.

EV Charging Analyzer for AC and DC-CCS extendable (mobile version).

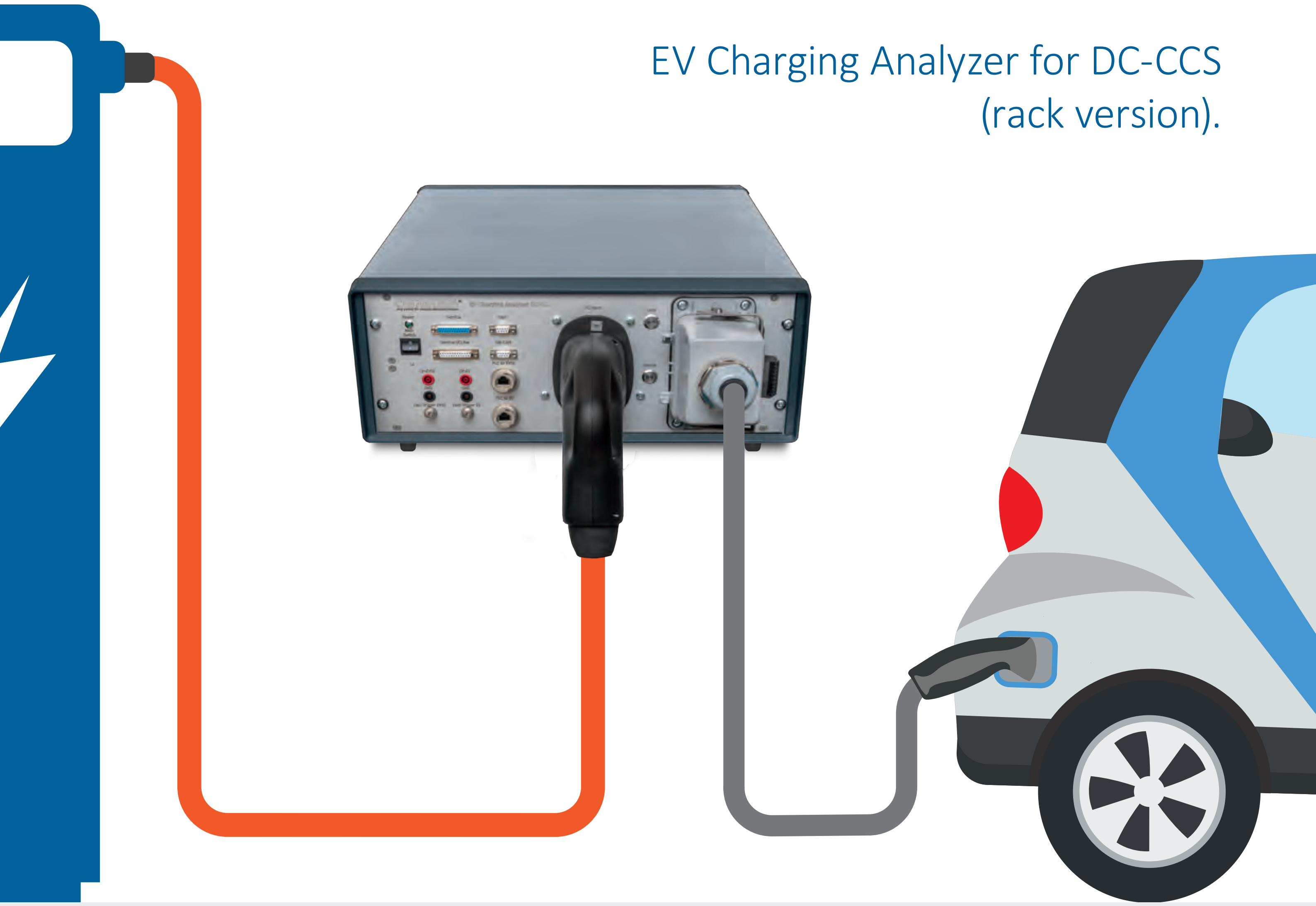


comemso meets new challenges with high quality.

Developments in e-mobility present new challenges for vehicle and charging-system manufacturers. Due to high availability of the 230V AC main power supply, conductive charging systems for electric vehicles are now widespread. The relatively new standards IEC 61851-1, DIN 70121, ISO 15118 and SAE J1772 describe the requirements for European and US AC- and DC-charging-systems, electrical waveforms and the pilot signal to control the charging process. By combining electric vehicles and charging systems from various manufacturers, different system-tolerances and disturbing influences may occur. The causes of charge interruptions are very difficult to locate due to the long charging period.

The comemso EV Charging Analyzer / Simulator measures and verifies both the communication and the load circuit on standard-conformity over the complete duration of charging and records all deviations. Thus causes of charge interruptions can be identified and causalities of events can be detected and visualised.

EV Charging Analyzer for DC-CCS (rack version).



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Global features.

- Leading measurement technology in the field of the charging system analysis.
- AC analysis according to IEC 61851-1 charging mode 1, 2 and 3, SAE J1772 and GB/T 18487.1-2015 (AC only).
- DC analysis according to IEC 61851-1 charging mode 4, DIN 70121, ISO 15118 and SAE J1772, as well as IEC 61851-23 Annex CC (option).
- Acts as PLC tracer (trace SLAC, V2G messages) with real measured AC/DC current and voltage on same time stamp.
- No oscilloscope required! Hard real-time and automated testing for compliance with standards of the control pilot signal in each period over several hours.
- Causes of charge interruptions or damages of components can be detected and logged, e.g. on “intolerance” between a specific electric vehicle with a specific charging station.
- Long-term analysis of the entire charging process.
- Real-time measurement, analysis and control over CAN interface functional tests (EV test / EVSE test) available, half-automated and with test libraries.
- Large number of connectors and adapters for different charging connector interfaces and applications.
- Modular expansion options, for software and hardware.
- Robust casing for mobile outdoor use, battery-powered [1], IP66 in closed case, IP54 in open case.
- Intuitive operation / easy test automation.
- In use successfully at premium EV / EVSE manufacturers.

[1]Depending on the model.

CP Communication self-test.

In field tests, it is sometimes difficult to identify the cause of unusual behaviour. It’s easy to check the measurement and simulation system on its own to ensure its proper working and calibration state. Therefore the EV Charging Analyzer (EVCA) can be self-tested by being connected to itself. Then EV simulation, EVSE simulation and measurement of the EVCA run alongside each other.

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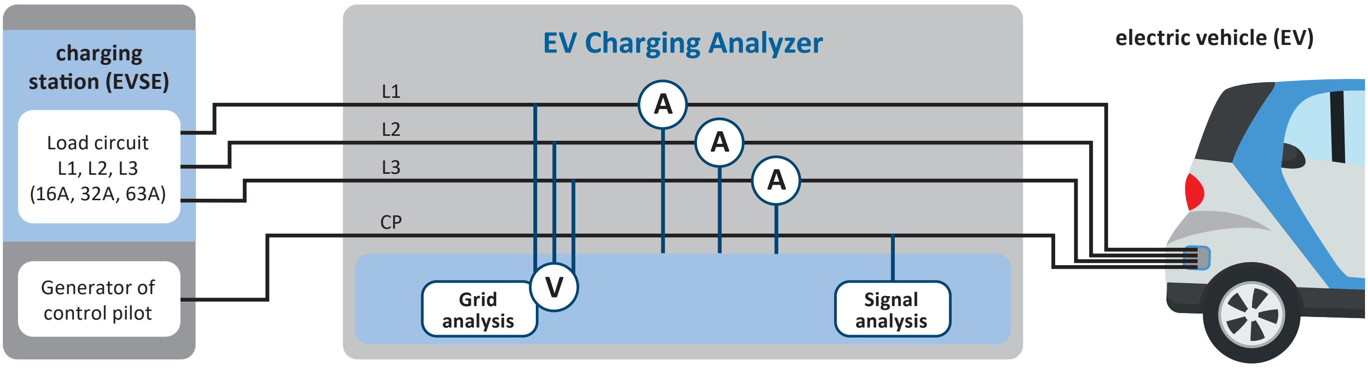
Verification of charging and grid quality.



Special options and extensions.

For an overview of further options to extend the basic functions and/or communication of the comemso EV Charging Analyzer, please contact: sales@comemso.de

Useable in challenging environments.

Successfully tested at Joint Research Centre of the European Commission in Ispra/Italy, even under extreme conditions (e.g. in climatic chamber at -25°C) and in other countries around the world (e.g. from Europe, USA, Asia, cold and hot climate testing).

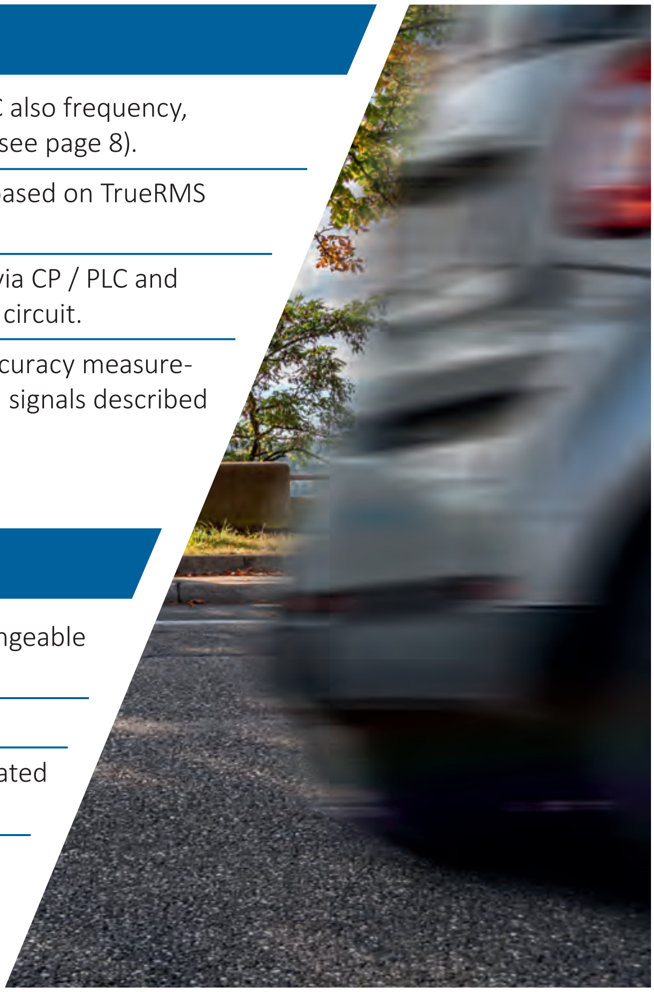
Technical features

Capture of AC/DC voltage + current of the load circuit, for AC also frequency, harmonic interferences up to 5 kHz with SnapShot function (see page 8).

Calculation of AC power (W) and energy (Wh) for L1, L2, L3 based on TrueRMS measurement of voltage and current.

Identification of permitted current, which is communicated via CP / PLC and synchronously comparable with real current flow in the load circuit.

Analysis of control pilot signal and all its parameters. High accuracy measurement methods, developed especially for analysis of electrical signals described in IEC 61851-1.



Features of AC/DC version

Identical to field version of EV Charging Analyzer → interchangeable test routines and control settings.

Switchable between AC and DC charging.

Customer-specific HV source and load (AC/DC) can be integrated with remote control.

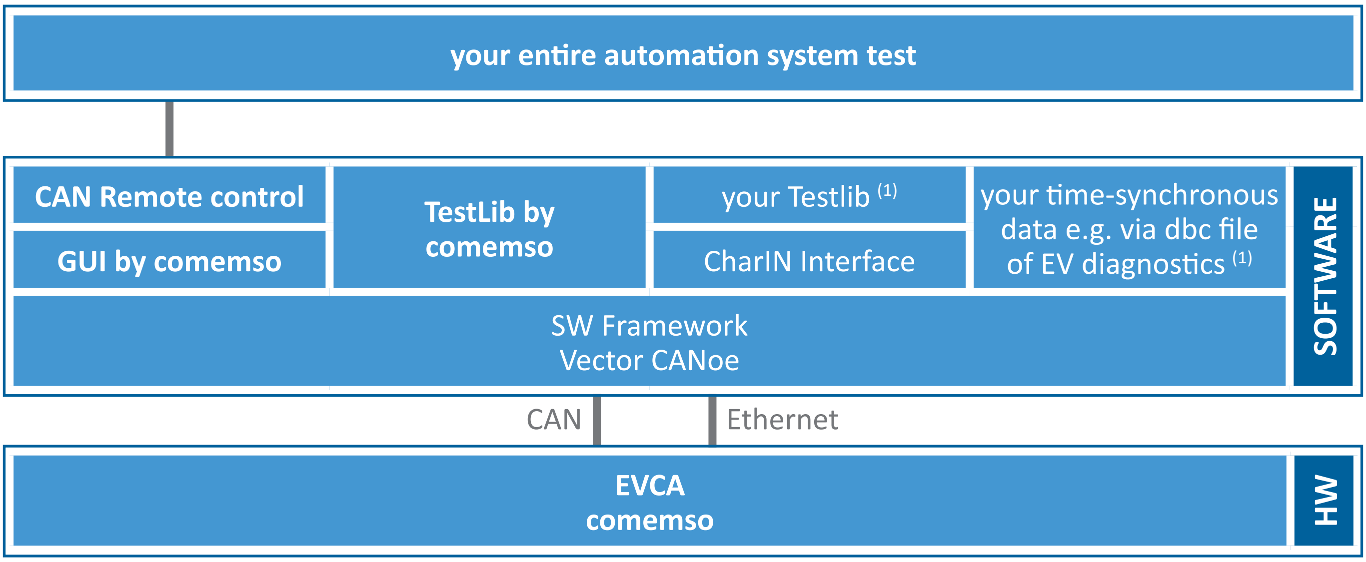
Optional extendable with further test automation tools (e.g. comemso EV Plug Cycle Emulation).

Fully integrated in Vector CANoe/vTESTstudio for test automation.

No oscilloscope can do this!

Time synchronous measurement of AC/DC power circuit and communication signals without losses over hours and hours, with logging option. As Man-in-the-Middle, or as EV test/EVSE test. **Available comemso test libraries and conformance analysis complete the EV Charging Analyzer/Simulator.**

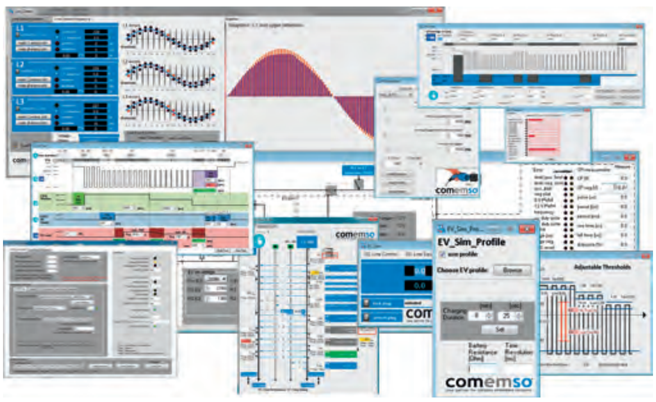
Ideal matching of hardware and software – our basic system architecture.



System architecture with worldwide established components in the automotive sector for a ready-to-use system with a short introduction effort.
[1] Requires CANoe PRO version.

Real-time user interface with various test and measurement options.

Convenient user interface designed by comemso for the EV Charging Analyzer with Vector CANoe software. Visualisation and control via CAN.



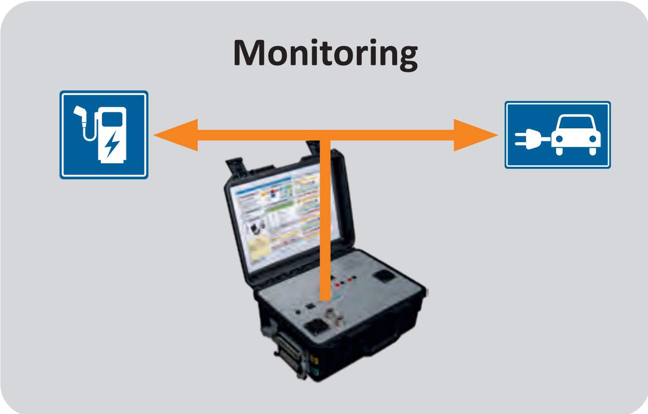
Helps to easier understand the complex charging process due to graphical visualisation for analysis and configuration!

Benefits:

- Remote control of the EVCA using your PC.
- Synchronous measurement with other CAN data, e.g. from your EV/charger.
- Convenient logging and replay function.
- Convenient analysis function by traces and graphics window of CANoe (synchronised).
- Ready test automation or even complete Test libraries (options).

Engineered for different kind of use.

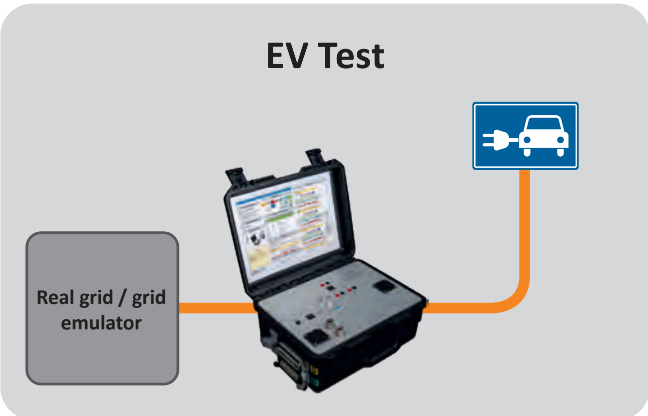
Charging verification (Man-in-the-Middle/series circuit analysis):



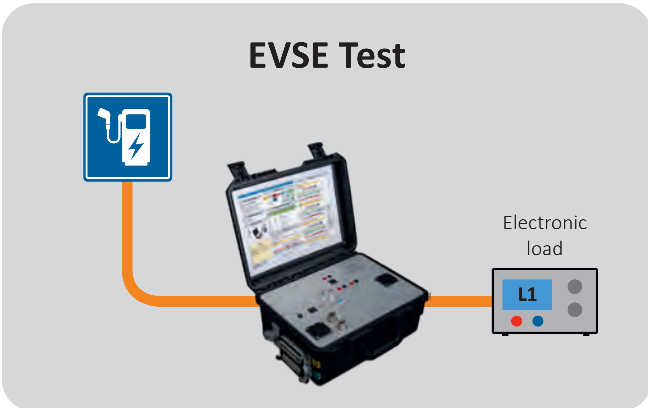
For more information, see page 8.

For more information, see page 9.

Simulation of EV and/or EVSE:



For more information, see page 10.



For more information, see page 11.

Test systems for outdoor/field or laboratory use.

Field application

Lab application

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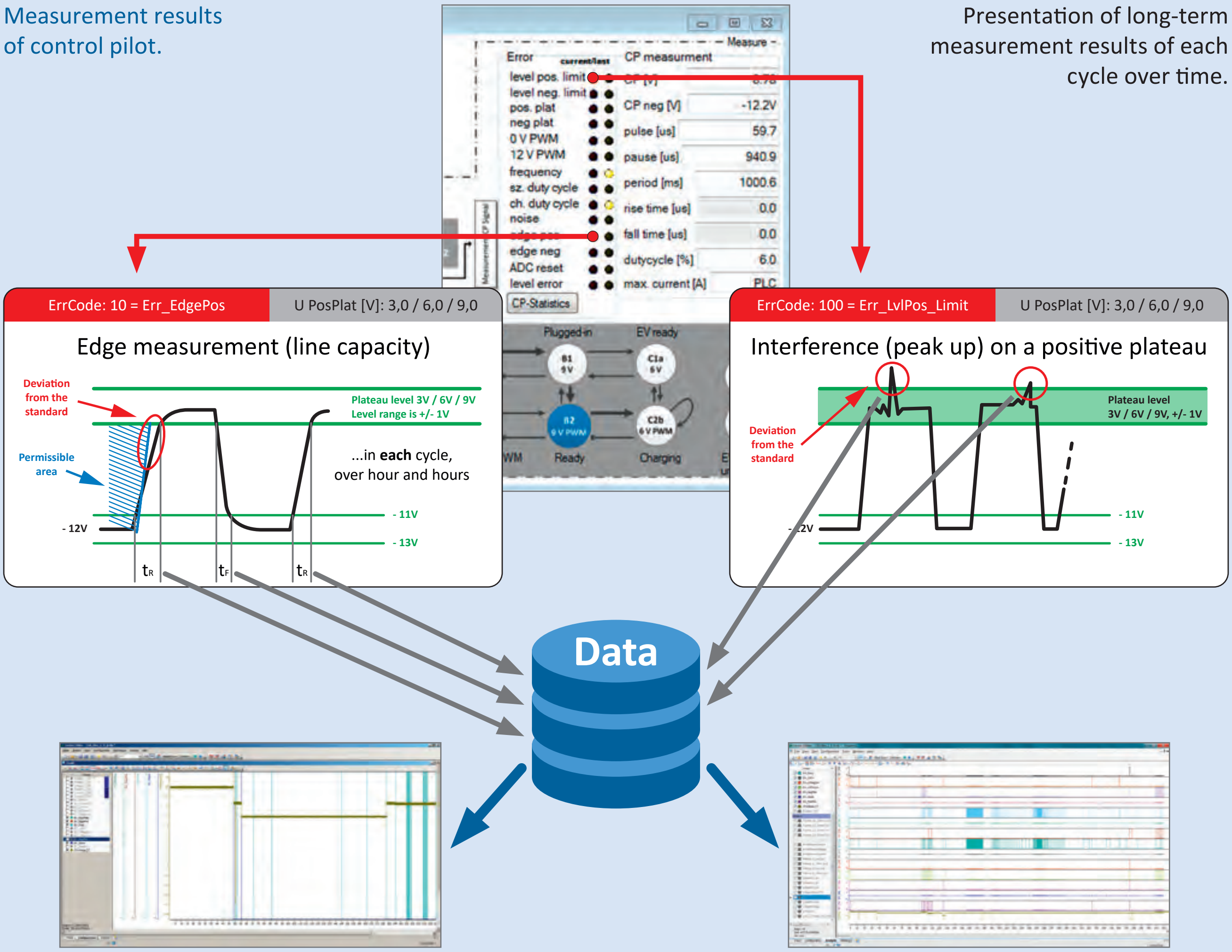
Measurement data analysis online / offline.

Real-time-measurement of all signal parameters via Control Pilot. In each cycle, which is each millisecond!

Measurement results of control pilot.

Presentation of long-term measurement results of each cycle over time.



Show parameters of CP over time.

View Errors / Odds as logic analyzer.

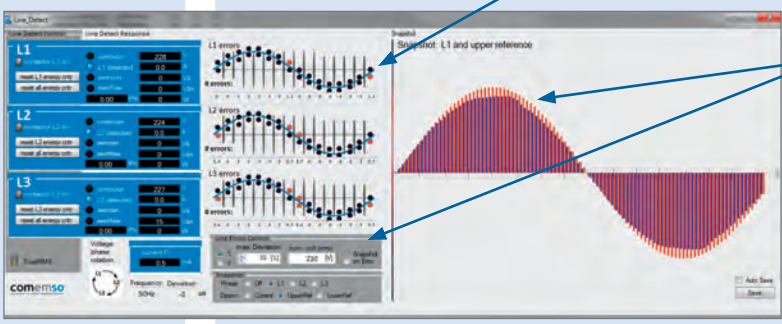
Mains (AC voltage and current as TrueRMS)

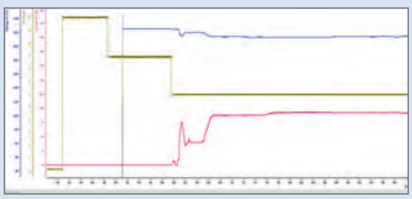
Grid quality (L1, L2, L3)

Grid quality information of each sine wave.

Presentation of measurement results over time in Vector CANalyzer / CANoe.

Get detailed grid measurement, e.g. with automatic snapshot on grid disturbances.

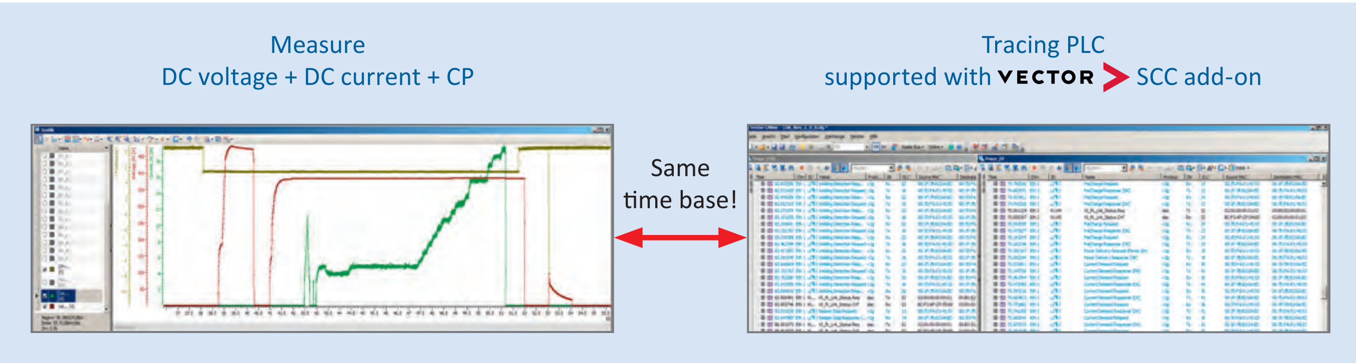




Time synchronous to communication data.

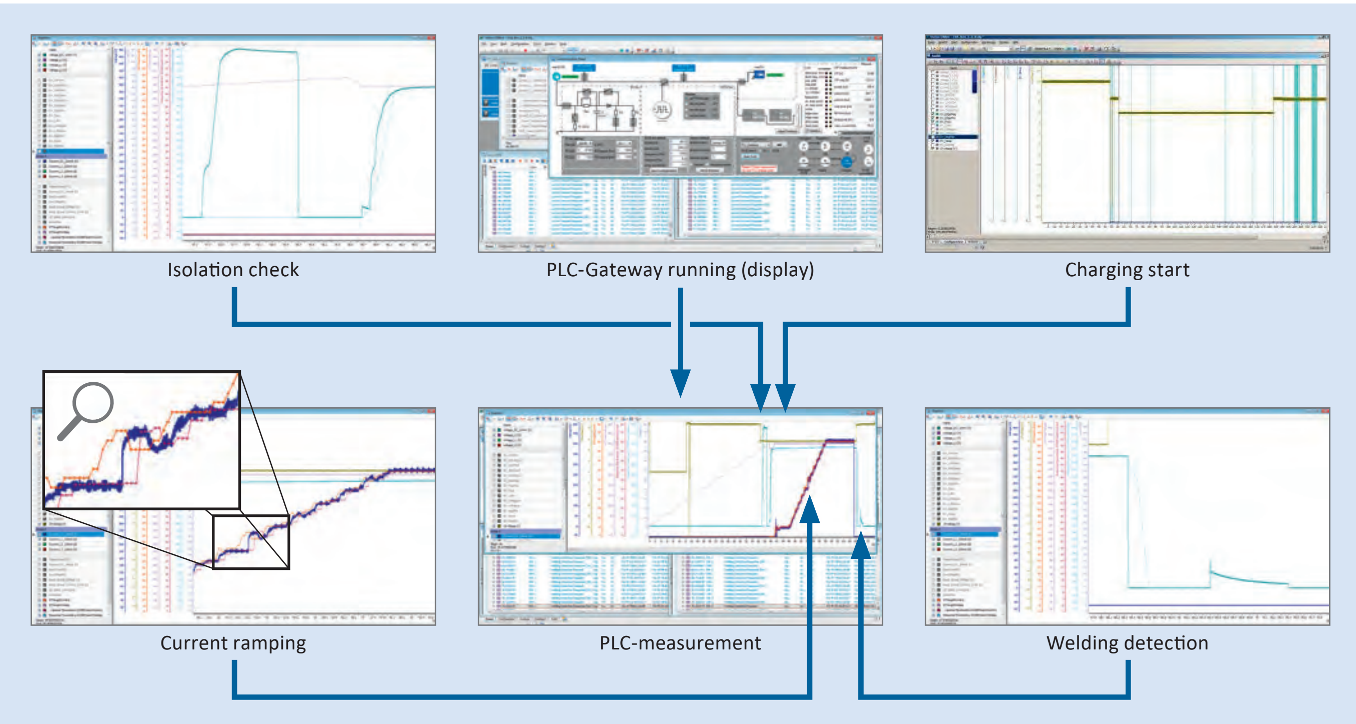
Measurement of DC PLC data with function “PLC-gateway”.

To give you an overview of the measurement between EV and EVSE with DIN 70121/ISO 15118, we display some more detailed images.



You can do the following:

- ► Monitor encrypted communication. (blue messages in picture: “PLC-Gateway_running”)
- ► Live comparison of the real measured values for DC voltage and DC current. (Picture: “PLC-Measurement”)
- ► Graphical comparison of the data communicated with the real measured values.



Caption:

Dark blue = Current measured by EV Charging Analyzer

Dark red = Current measured by EVSE (from PLC data)

Orange = Current requested by EV (from PLC data)

Blue-green = real measured Voltage by EV Charging Analyzer

Light Blue = Voltage measured by EVSE (from PLC data)

Violet = Battery voltage of EV (from PLC data)

EVCA measurement with PLC data sniffing.

With the additional sniffer function (HW + SW), which is optionally available for all EVCA systems (suitcase, rack, ...), you can read out the following, unadulterated data:

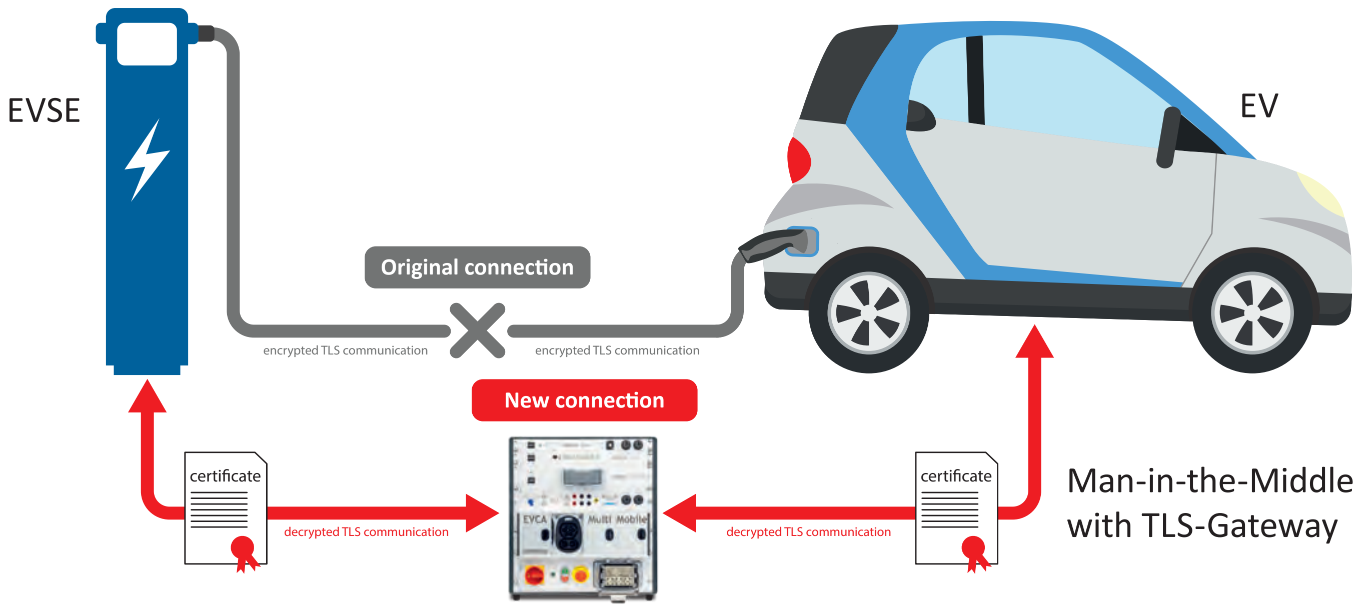
- original AC or DC voltage measurement of comemso hardware
- original PP resistor measurement
- original CP signal
- original SLAC messages between real EV and real EVSE
- original PLC messages

The decoding of TLS encrypted data is not possible. For this, the equally optional TLS-Gateway is required as listed below.

PLC-Sniffer module
with EVCA suitcase

TLS decryption, extended Man-in-the-Middle.

If you want to use the comemso EVCA system as a Man-in-the-Middle, the system can not only measure without influence (no decryption), it also performs Man-in-the-Middle for DIN 70121 and ISO 15118 EXI decoding. Now also new: Man-in-the-Middle for ISO 15118 PnC/TLS communication. This provides you the entire communication for analysis, including deeply encrypted messages, time-synchronous to the signals and power measurement (voltage/current).



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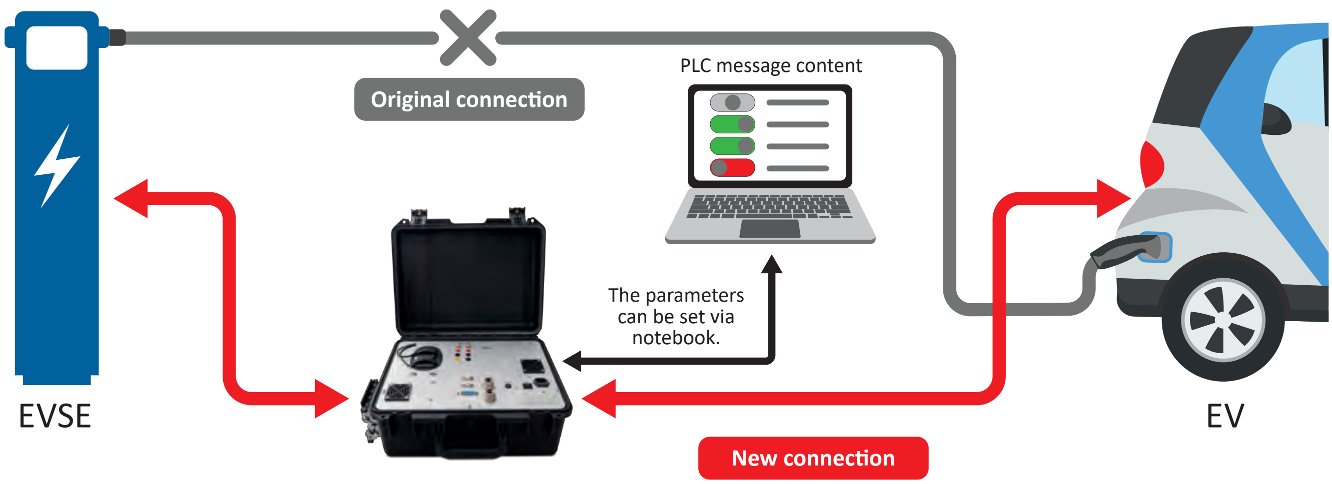
Interoperability testing on a second level with DC-CCS Manipulating Gateway.

The manipulating gateway allows you to change a parameter of EV messages during the measurement between EV and EVSE without changing the firmware of an EV ECU, or to change a parameter of EVSE without support of the EVSE manufacturer.
For example, if EV and EVSE do not match, you can change a parameter of PLC communication between EV and EVSE and see if this would solve the problem.

Additionaly, you can check EV or EVSE if they would accept also other PLC message content for proper chargers (tolerance analysis of messages).
A third option is to inject faults with the DC-CCS Manipulating Gateway. This allows you to change voltage / current parameters and limits and overwrite responses with error responses. This saves a lot of time in your research and analysis.



Overview

Change PLC message content during runtime for
- EV request or
- EVSE response incl. response codes.

Remove PLC message content during runtime.

Save and load configurations.

Your advantages

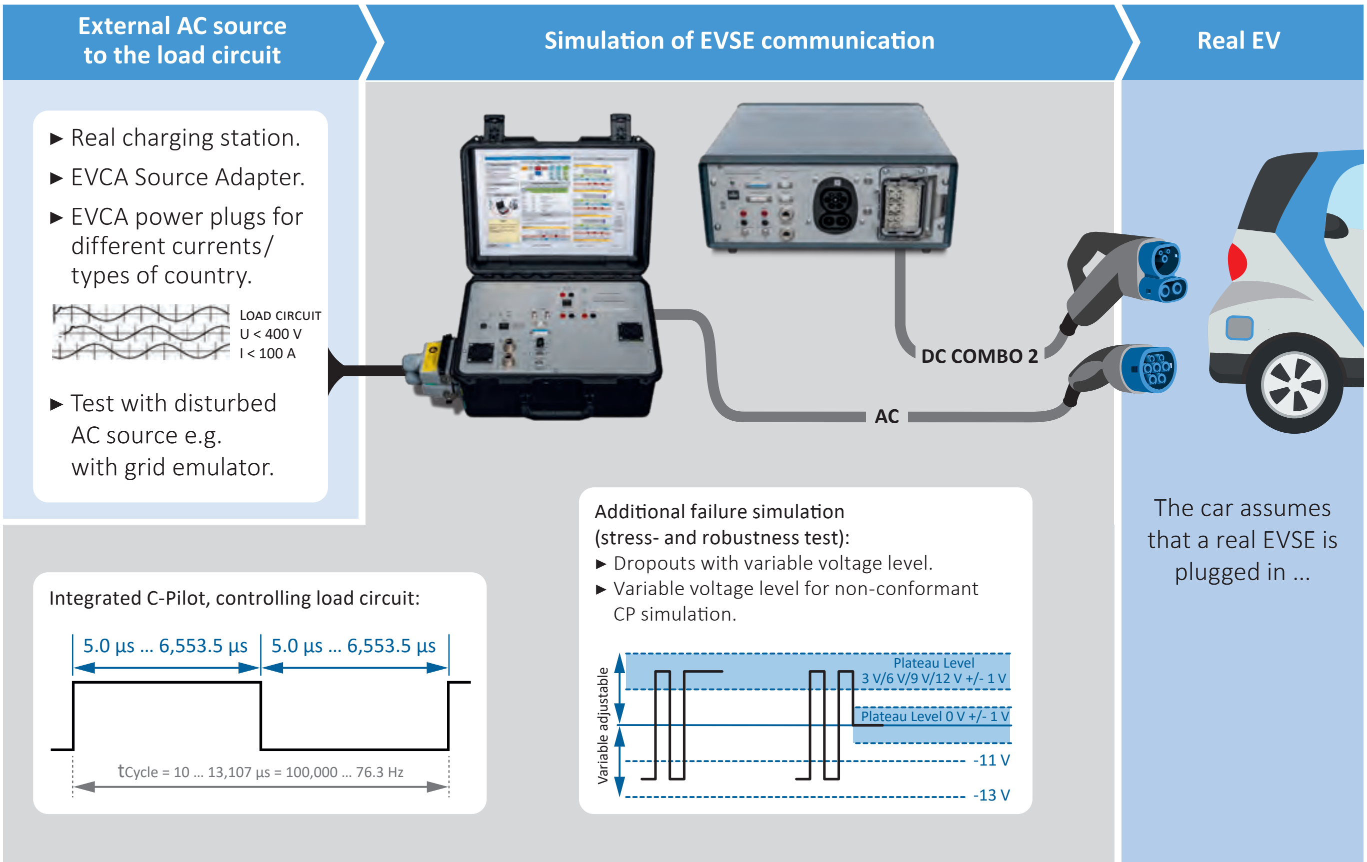
Interoperability testing with next step of solution research.

Set sporadic message as steady content to get reproducible.

Research behavior and tolerances for acceptable changes.

AC/DC-CCS – EV-Test.

Option 1: EVSE Simulation (EV test for limits, robustness).



Full-automatic EV/EVCC test libraries.

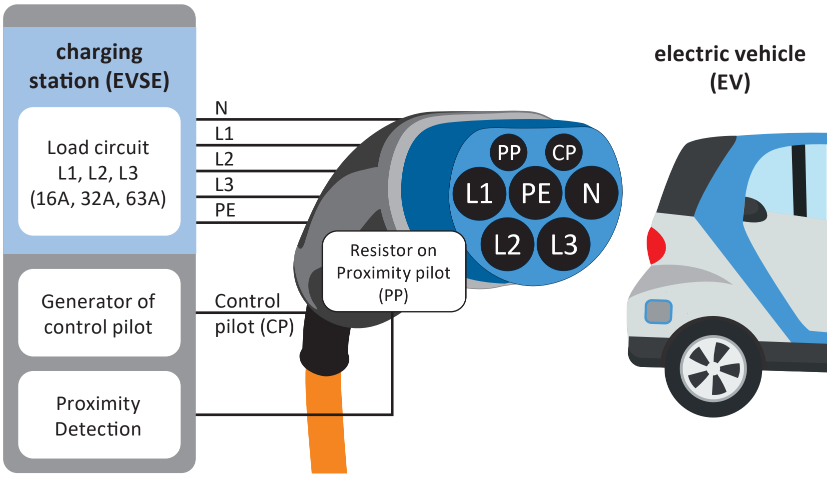
Available test libraries to check standard conformity for EVs/EVCCs according to:

- IEC 61851-1 (AC)
- ISO 15118-4
- ISO 15118-5
- DIN 70122
- CharIN test cases

Further electrical functions: PP emulation.

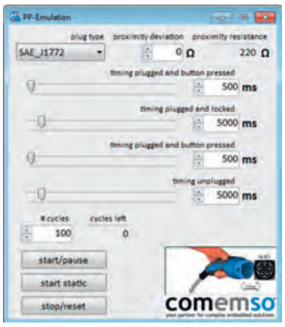
With the emulation of the PP resistor, new possibilities arise due to the switch ON/OFF option, to emulate plugging and unplugging of connector. Simple solution with major benefits.

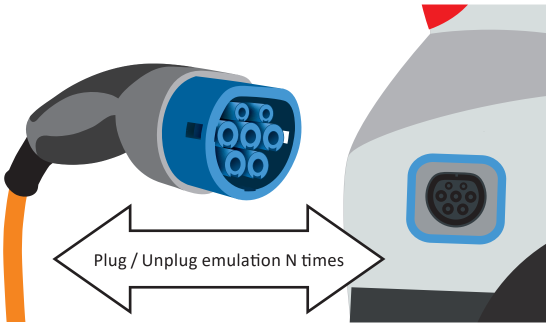
Check reliability of EV charging process. This test is usually executed for each new EV OBC firmware release.



PP emulation / Plug cycle emulation.

Used also for test automation. Usable for EV test and EVSE test.





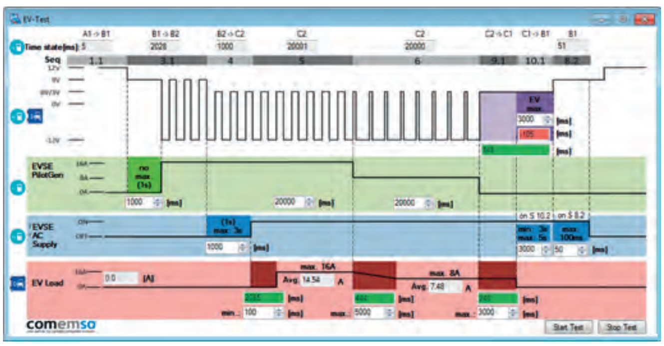
Plug cycle emulator.

- ► Emulation of cyclic plug tests, with tracing of Control pilot data and load circuit through EV Charging Analyzer.
- ► Change of PP resistor values (resolution 1 Ohm).
- ► For EV or EVSE side.
- ► On EV side: can be combined with automated EV test process for each cycle!

AC Test automation – Included with EVSE simulation option combined with plug cycle emulation.

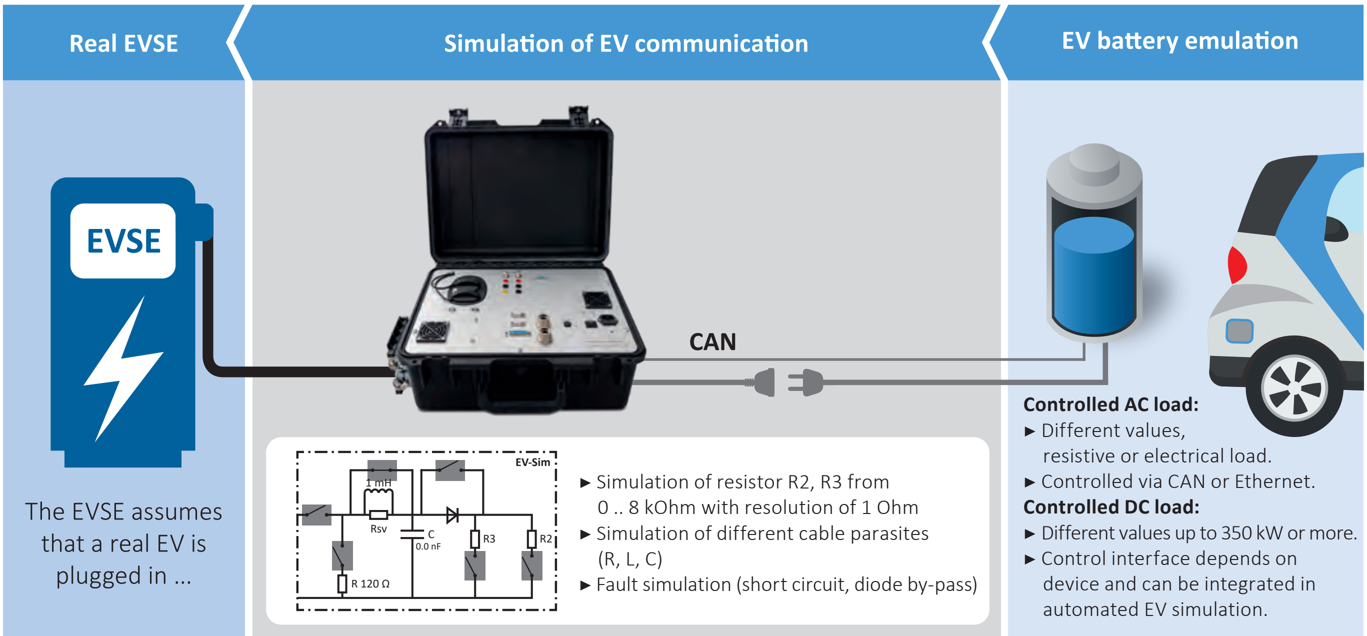
Convenient CANoe panel from comemso:

- ► fully set up charge cycle
- ► configurable timings
- ► transparent control
- ► clear and traceable



AC/DC-CCS – EVSE-Test.

EV simulation – Included in the basic version.

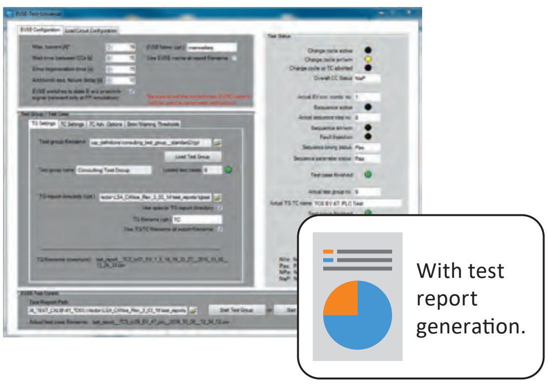


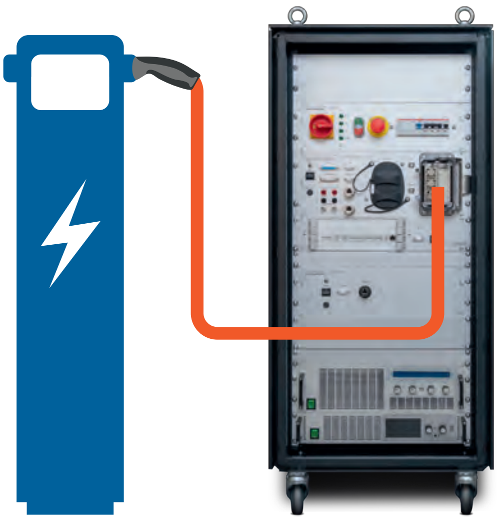
Full-automatic EVSE/SECC test libraries.

Available test libraries to check standard conformity for EVSEs/SECCs according:

- IEC 61851-1 (AC)
- IEC 61851-23 ed. 2, Annex CC (DC) – only EVSE
- ISO 15118-4
- ISO 15118-5
- DIN 70122
- CharIN test cases

Fast and automated verification of electrical standard conformity of EVSEs/SECCs. The library can be used in field operations to easily find EVSE errors, or during the EVSE development process for verification or regression testing.





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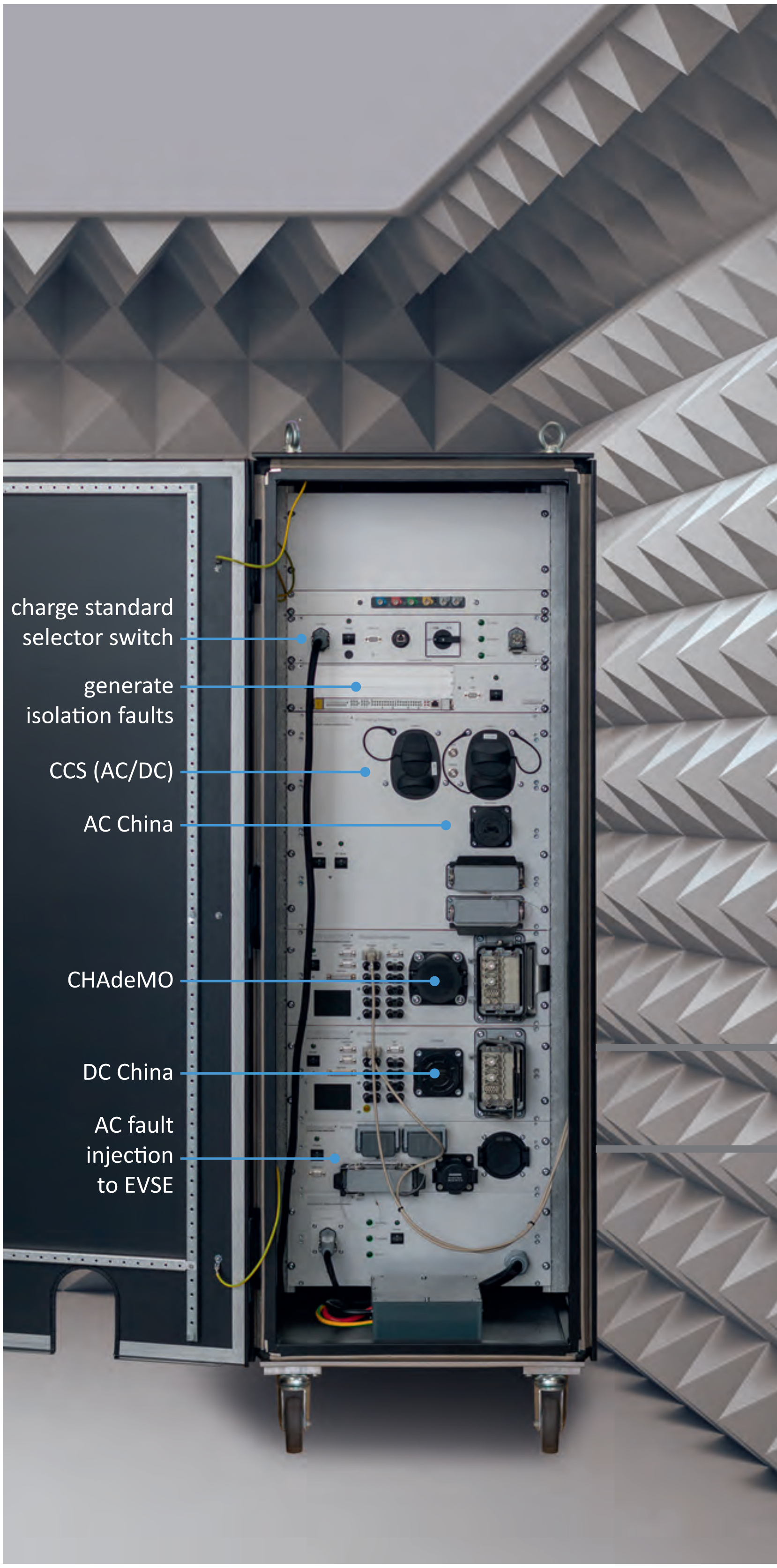
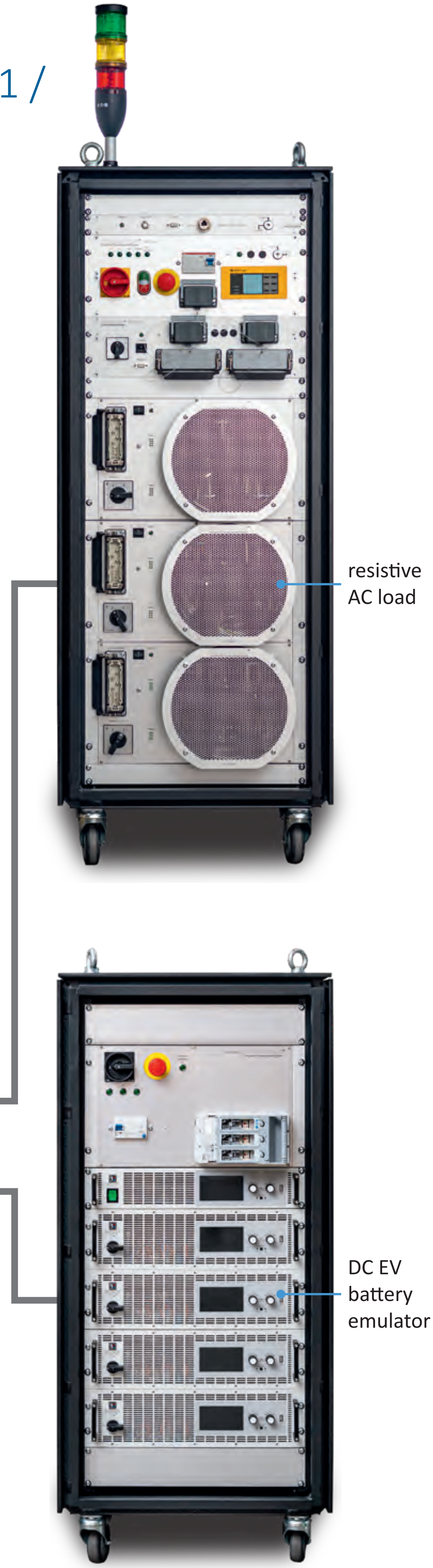
Example system for EMC laboratory IEC 61851-21-2 (EVSE-Test), IEC 61851-21-1 / R010r5 (EV-Test) also available.





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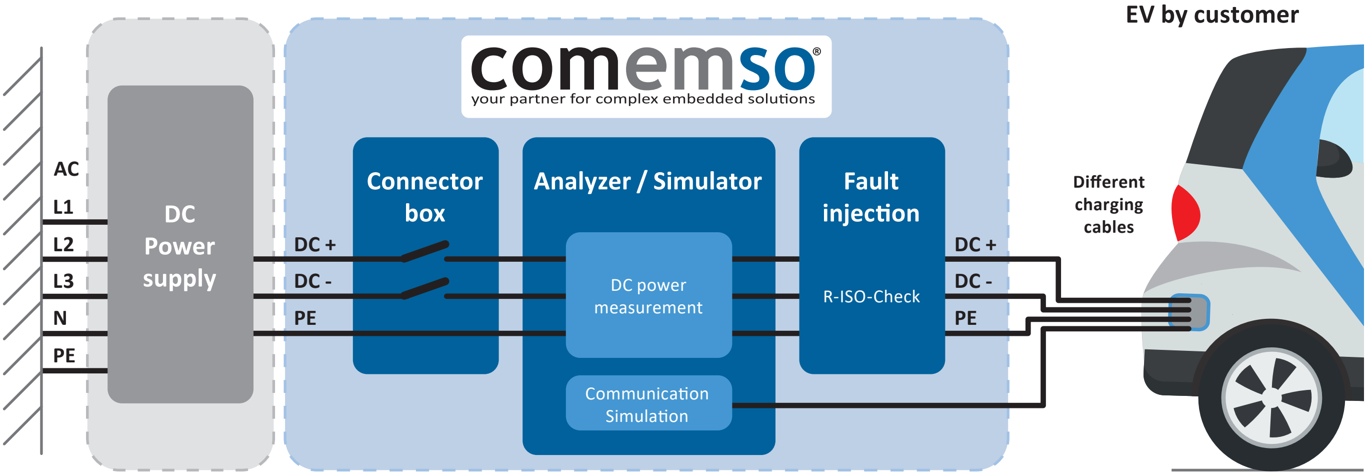
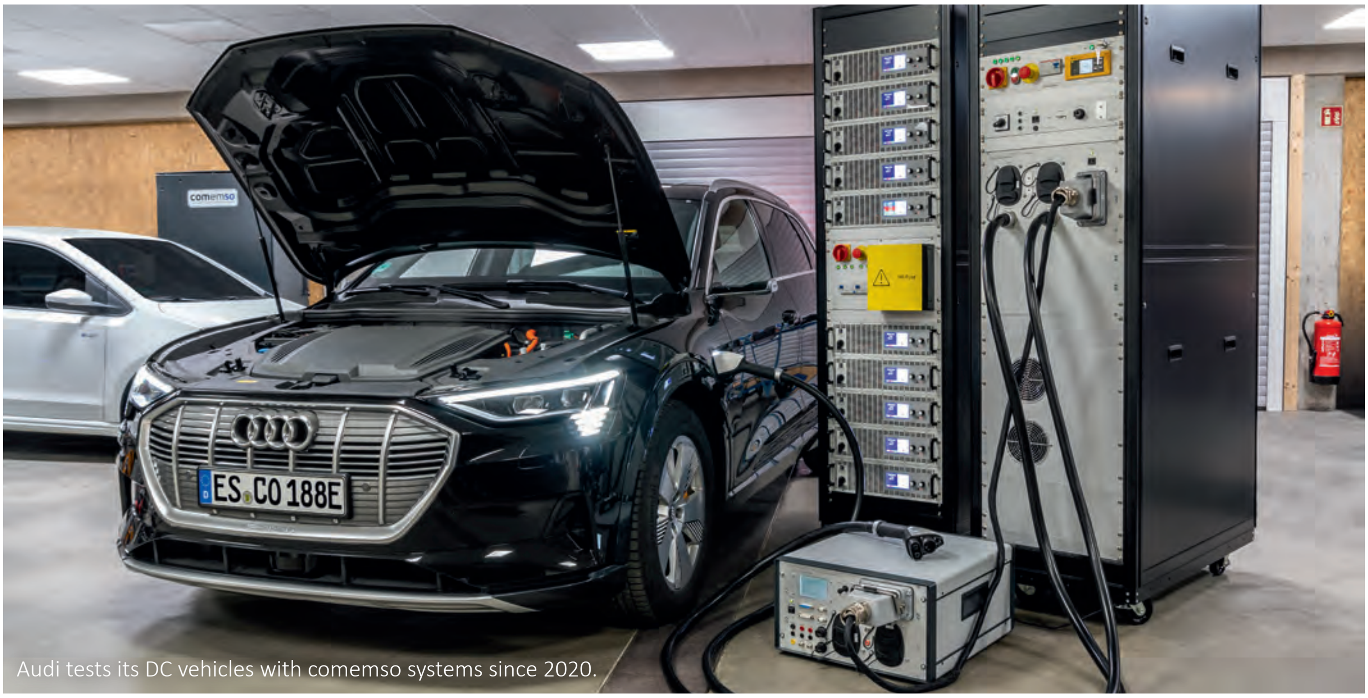
350 kW applications.

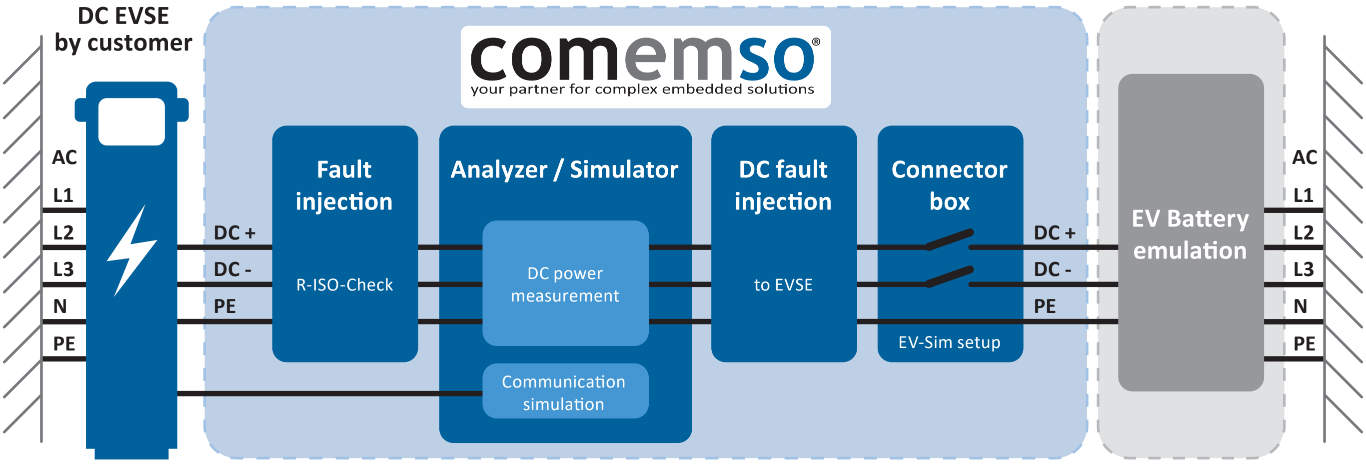
DC application – EV Test (DC EVSE-Simulation):



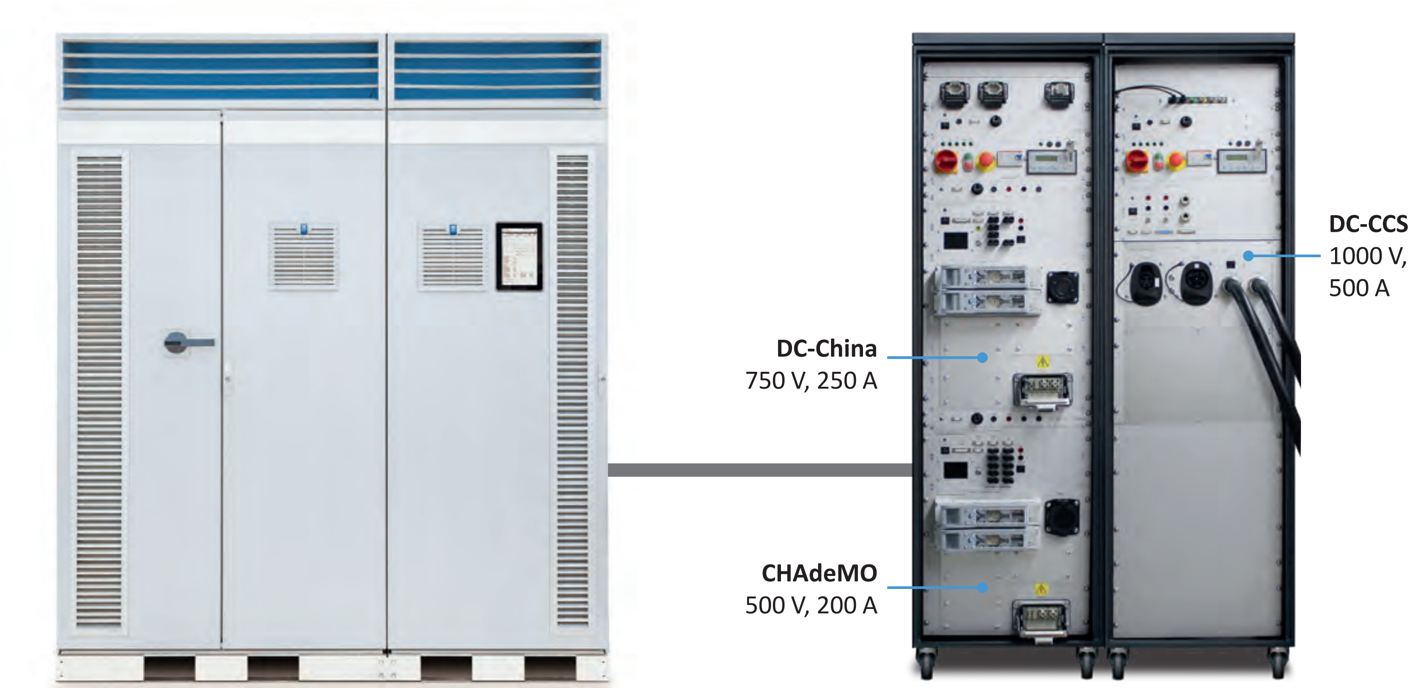


Audi tests its DC vehicles with comemso systems since 2020.

DC application – EVSE Test (DC EV-Simulation):



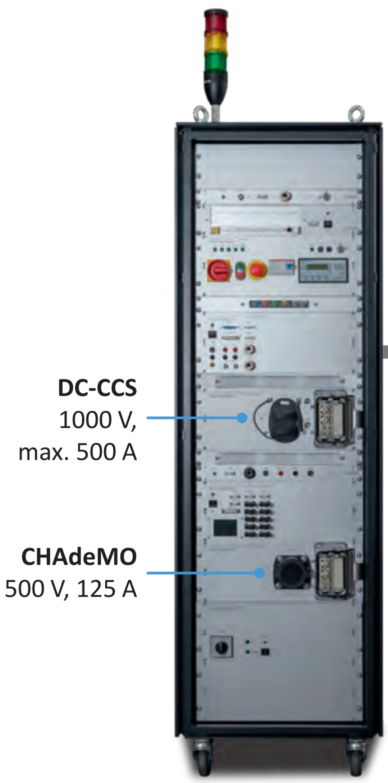
Example system for EV-Test, 350 kW DC-CCS:



Example for a 400 kW battery emulator (not complete).

Example system for EVSE-Test, 350 kW DC-CCS:

Software example:
Emulate different EV current profiles.



Example for a 400 kW battery emulator (not complete).

250 kW and 500 kW EVSE full performance testing.

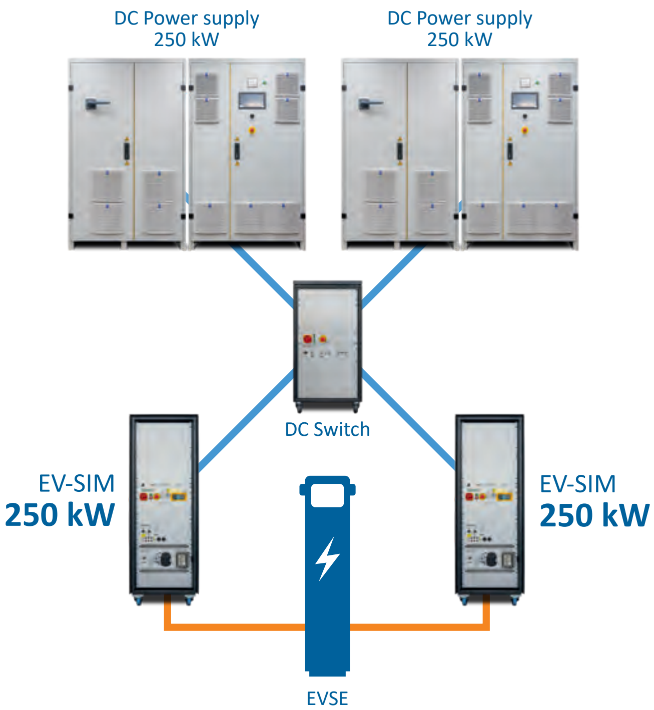
Especially 350 kw HPC EVSE tests with two DC-CCS connectors (or other standards) are a special challenge. We have a convenient solution for the full performance test:

► You can automatically switch between the 500 kW test for one EVSE connector or 2 x 250 kW for the synchronized test of two EVSE connectors using the same EV battery emulator / bidirectional power supply. (See pictures below.)

► Perform independent protocol and electrical tests (e.g. insulation faults) for each EVSE connector.

► Record the behavior for in-depth analysis and use a fully automated on-the-fly protocol analysis and visualization by the comemso software.

250 KW EVSE-TEST (SYNCHRONIZED PLUGS)



500 KW EVSE-TEST

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Testing EVSEs with 350kW in the field.

EVSE pioneers provide 350kW charging solutions and charge network companies build a high-power charging grid, even that EVs with such charging power are not ready as series-production vehicle. There is a great progress to solve the needs of the worldwide fast-charging infrastructure. To ensure, that the investment in the infrastructure is fully working, also such EVSEs need to be tested under full power after installation and maintenance. Here you can see an example of a 350 kW EVSE test system installed in a 3.5-7.5t vehicle.

The mobile measuring laboratory in the trunk.

Whether for vehicle interoperability measurements in the field or compliance testing in the laboratory, the EVCA Multi Mobile gives you access to all charging standards for AC, DC-CCS Type 1 + 2, CHAdeMO and DC China (GB/T) in a portable rack that is ready for immediate use anywhere.
Without mechanical mounting you activate the desired charging standard with the help of intuitive sliding flaps and can thus directly check the communication and the charging process for conformity to standards automatically and measure all details. Even complete test libraries for norm conformity tests can be conducted. The results are stored on a connected PC, where they can be analysed and evaluated live in real time, or afterwards using the user-friendly visualization.

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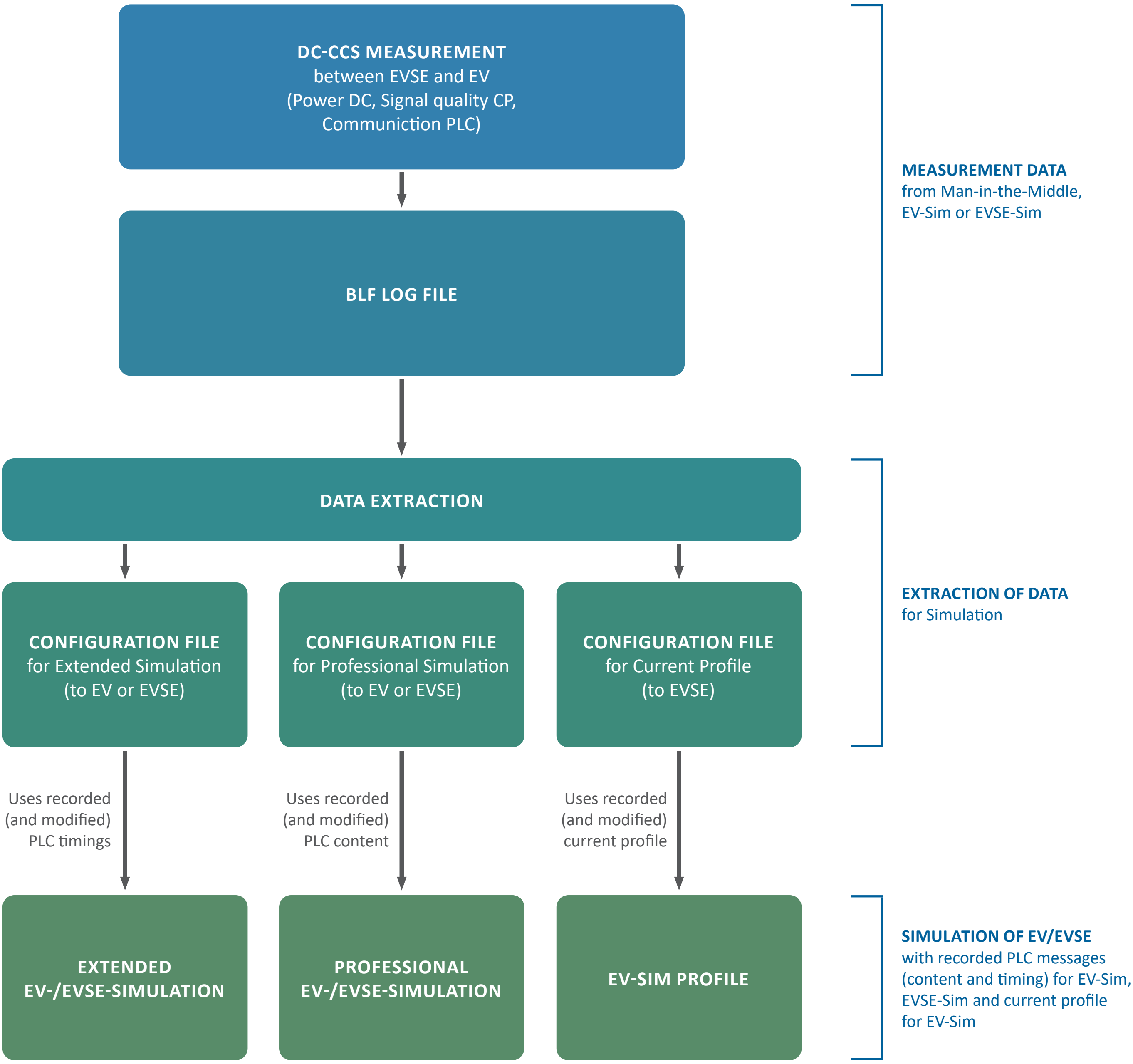
Replay your log file data.

With the comemso EV Charger Analyzer/Simulator product family, developers and testers have the possibility to perform interoperability tests with a man-in-the-middle EVCA and EV/EVSE tests in the field and in the laboratory. With the replay function, you can now use your man-in-the-middle log files for your EV/EVSE tests, especially for PLC communication behavior in the first step. With this option you can even use your many years old log files and play them back instantly. This replay function is covered by maintenance. The block diagram below shows how it works.



Technical data.

	Suitcase version	Rack version
AC power supply voltage	110 .. 230VAC, 50/60Hz, int. 24 VDC battery	110 .. 230VAC, 50/60Hz
Weight	15kg	depends on the variant
Water resistance according to IEC standard 60529	closed lid: IP67 open lid: IP30 (with connected plugs)	IP30 (with connected plugs)
Size (L x W x D)	520 x 390 x 230mm	19" 4HU .. 9HU, depends on the variant
Operating temperature	-20 .. +60°C (without battery)	+10 .. 50°C
Interface	CAN 1MBit/s, Ethernet for PLC	CAN 1MBit/s, Ethernet for PLC
Test/analysis standards AC	IEC 61851-1, SAE J1772, GB/T 18487.1-2015 (AC only), ISO 15118	IEC 61851-1, SAE J1772, GB/T 18487.1-2015 (AC only), ISO 15118
Test/analysis standards DC	DIN 70121, ISO 15118-1/-2/-3, IEC 61851-1, IEC 61851-23 (CCS only), IEC 61851-24 (CCS only), DIN 70122, ISO 15118-4/-5	DIN 70121, ISO 15118-1/-2/-3, IEC 61851-1, IEC 61851-23 (CCS only), IEC 61851-24 (CCS only), DIN 70122, ISO 15118-4/-5
Test/analysis standard EMC		IEC 61851-21-2, IEC 61851-21-1, ECE R010
EV charging voltage AC	AC 100 .. 120V, 230V, 208 ..240 Split phases. Up to 3 phases, separately switchable.	AC 100 .. 120V, 230V, 208 ..240 Split phases. Up to 3 phases, separately switchable.
EV charging current AC	Up to 50A at the case, standard AC charging cable 32A.	Up to 50A at the case, standard AC charging cable 32A, currently on request up to 63A Type 2, 80A Type 1 availible.
EV charging voltage DC	up to 1000V	up to 1000V
EV charging current DC	up to 125A	up to 200A, 500A with cooling

Electrical specification.

CharIN function name	Unit	Normative requirement	Range	Resolution	Accuracy
CP EVSE-SIM					
CP_EVSE_get_Voltage_positive	Volt (V)	IEC 61851-1:2017, Table A.4	0.0 .. 13.8	measure 0.007463, transfer 0.01	±0.1
CP_EVSE_get_Voltage_negative	Volt (V)	IEC 61851-1:2017, Table A.4	-13.8 .. 0.0	measure 0.007463, transfer 0.01	±0.1
CP_EVSE_set_Voltage	Volt (V)	IEC 61851-1:2017, Table A.2	0.0 .. 13.8 for pos. Level, -13.8 .. 0.0 for neg level, each independent	transfer 0.1	±0.1
CP_EVSE_set_Oscillator	Bool		on; off	1	1
CP_EVSE_set_Frequency	Hertz (Hz)	IEC 61851-1:2017, Table A.2	Pulse and Pause each: 5 .. 60000 µs, Range: 0; 8 Hz .. 100 kHz	0.5 µs	± 1 µs
CP_EVSE_get_Frequency	Hertz (Hz)		Pulse and Pause each: 320 .. 2995 µs, summary 200 .. 3000 µs Range: 0; 333Hz .. 5 kHz	0.1 µs = 0.0001 Hz	±1 µs = +/-0.001 Hz
CP_EVSE_get_State	Enum	IEC 61851-1:2017, Table A.4	A1; A2; B1; B2; C1; C2; D1; D2; E; F; Invalid. Threshold changeable.	Threshold for get_State changeable with resolution 0.1 V	±0.1
CP_EVSE_set_Dutycycle	Percent (%)	IEC 61851-1:2017, Table A.7, A.8, Table A2 requires duty cycle measurement at 0V crossing	0; 1 .. 99; 100	0.5 µs	±1 µs
CP_EVSE_get_Dutycycle	Percent (%)	IEC 61851-1:2017, Table A.7, A.8	0; 2 .. 98; 100	0.1 µs	±0.2 µs
CP_EVSE_get_Rise_time	Time (µs)	IEC 61851-1:2017, Table A.11	0.1 .. 30	0.1	±0.1
CP_EVSE_get_Fall_time	Time (µs)	IEC 61851-1:2017, Table A.11	0.1 .. 30	0.1	±0.1
CP_EVSE_set_Capacitance	Farad (pF)	IEC 61851-1:2017, Table A.2	0; 300; 1500; 1600; (1800 = 300 + 1500); 2400; (3100 = 1500 + 1600), (3900 = 2400 + 1500), more through combination.	-	± 5%
CP_EVSE_set_Open_Circuit	Bool		0; 1	1.0	1
CP_EVSE_set_Resistance	Ohm (Ω)	IEC 61851-1:2017, Table A.2	960; 1000; 1040	1.0	0.1%
CP EV-SIM					
CP_EV_get_Voltage	Volt (V)	IEC 61851-1:2017, Table A.4	-13.8 .. +13.8	measure 0.007463, transfer 0.01	±0.1
CP_EV_get_Frequency	Hertz (Hz)	IEC 61851-1:2017, Table A.2	Pulse and Pause each: 3 .. 2995 µs, summary 200 .. 3000 µs Range: 0; 333 Hz .. 333 kHz	0.1 µs = 0.0001 Hz	±1 µs = +/-0.001 Hz
CP_EV_set_Resistance_R2	Ohm (Ω)	IEC 61851-1:2017, Table A.3	0 .. 8000	1.0	0.1%
CP_EV_set_Resistance_R3	Ohm (Ω)	IEC 61851-1:2017, Table A.3	0 .. 8000	1.0	0.1%
CP_EV_get_State	Enum	IEC 61851-1:2017, Table A.4	A1; A2; B1; B2; C1; C2; D1; D2; E; F; Invalid	-	-
CP_EV_get_Dutycycle	Percent (%)	IEC 61851-1:2017, Table A.7, A.8	0; 2 .. 98; 100	0.2 µs = 0.02	±0.1 (resp. +/-1 µs)
CP_EV_get_Rise_time	Time (µs)	IEC 61851-1:2017, Table A.11	0.1 .. 30	0.1	±0.1
CP_EV_get_Fall_time	Time (µs)	IEC 61851-1:2017, Table A.11	0.1 .. 30	0.1	±0.1
CP_EV_set_Capacitance	Farad (pF)	IEC 61851-1:2017, Table A.3	0; 300; 1500; 1600; (1800 = 300 + 1500); 2400; (3100 = 1500 + 1600), (3900 = 2400 + 1500), more through combination.	-	±5%
CP_EV_set_Short_Circuit	Bool	IEC 61851-1:2017, Annex A, Figure A.8 IEC 61851-1:2017, Test A.4.9	0; 1 (with 120 Ω)	1	1
CP_EV_set_Open_Circuit	Bool		0; 1	1	1
CP_EV_set_Short_Diode	Bool	IEC 61851-1:2017, Clause A.3 Sentence 14	0; 1	1	1
CP_EV_set_Voltage_Diode	Volt (V)	IEC 61851-1:2017, Table A.3	0.7	-	-

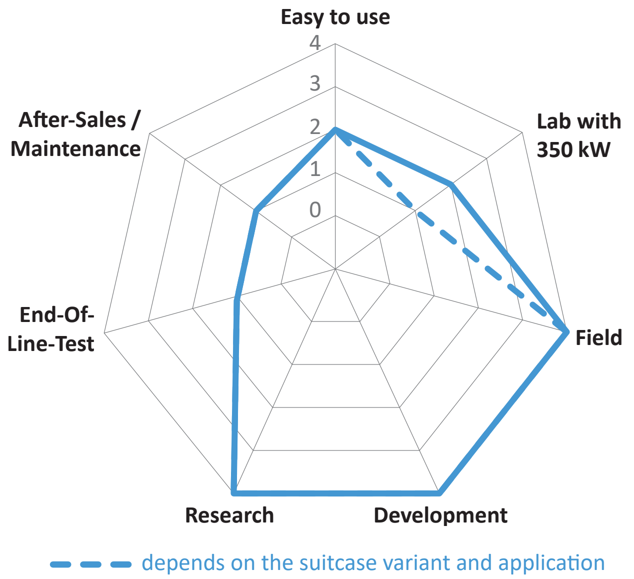
CharIN function name	Unit	Normative requirement	Range	Resolution	Accuracy
PP EVSE-SIM					
PP_EVSE_set_Resistance	Ohm (Ω)	IEC 61851-1:2017, Table B.1, B.2	0 .. 8000	1	0.1%
PP_EVSE_Measure_Resistance	Ohm (Ω)		0 .. 4600	1	±2%
PP_EVSE_set_Short_Circuit	Bool		0; 1	1	1
PP_EVSE_set_Open_Circuit	Bool		0; 1	1	1
PP EV-SIM					
PP_EV_set_Resistance	Ohm (Ω)	IEC 61851-1:2017, Table B.1, B.2	0 .. 8000	1.0	0.1%
PP_EV_Measure_Resistance	Ohm (Ω)		0 .. 4600	1	±2%
PP_EV_set_Short_Circuit	Bool		0; 1	1	1
PP_EV_set_Open_Circuit	Bool		0; 1	1	1
AC MEASURE					
HV_measure_AC_U_L1_N_rms	Volt (V)		0 .. 400	measure 0.01465, transfer 1	±1V True RMS, per line 100 measurement ponits
HV_measure_AC_U_L2_N_rms	Volt (V)		0 .. 400	measure 0.01465, transfer 1	±1V True RMS, per line 100 measurement ponits
HV_measure_AC_U_L3_N_rms	Volt (V)		0 .. 400	measure 0.01465, transfer 1	±1V True RMS, per line 100 measurement ponits
HV_get_switch_off_time	Time (ms)	IEC 61851-1:2017, Seq. 8.1, Seq. 8.2, Seq. 12, Test 5.8, Test 5.9 IEC 61851-1:2017, Req. RA04-050 IEC 61851-23 Ed.2 Chapter 6.3.1.113.3	0 .. 3000	1	±1ms
HV_measure_AC_I_L1_rms	Ampere (A)		0 .. 50	measure 0.001795, transfer 0.1	± 0.1A True RMS, per line 100 measurement ponits
HV_measure_AC_I_L2_rms	Ampere (A)		0 .. 50	measure 0.001795, transfer 0.1	± 0.1A True RMS, per line 100 measurement ponits
HV_measure_AC_I_L3_rms	Ampere (A)		0 .. 50	measure 0.001795, transfer 0.1	± 0.1A True RMS, per line 100 measurement ponits
HV_measure_AC_fault current	Milliampere (mA)		-300 .. 300	measure 0.009, transfer 1	±1mA offset ± 0.5% of value
Leak current (FI) measurement is not available on devices with > 50A capability.					
DC MEASURE					
HV_measure_DC_U	Volt (V)	IEC 61851-23 Ed.2 chapter 101.2.1.2.2	5 .. 1000	measure 0.01525, transfer 1	±0.1V offset ± 0.5% of value
HV_measure_DC_I	Ampere (A)	IEC 61851-23 Ed.2 Annex CC.6.3	0.3 .. 200 0.3 .. 500	measure 0.00305, transfer 0.1 measure 0.00763, transfer 0.1	±0.1A offset ± 1% of value
HV_measure_DC_fault current	Milliampere (mA)		-150 .. 150	1	±2mA offset ± 1% of value

Product categorization matrix.

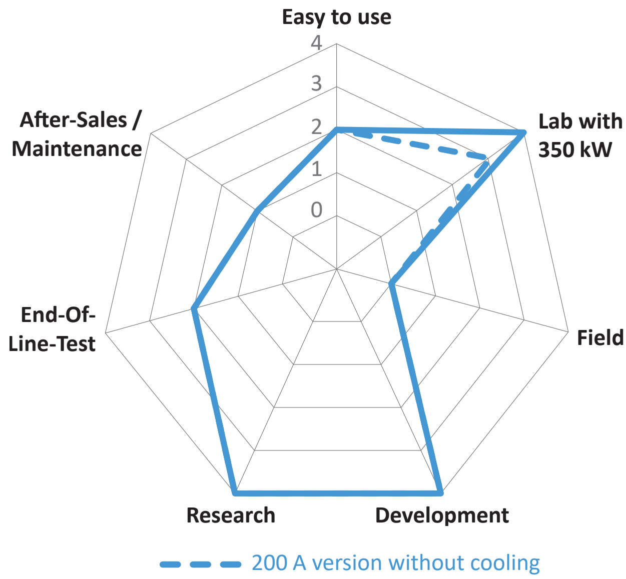
The product categorization matrix from comemso gives you an overview of the features and possibilities of the system presented in this brochure. This helps you to find the right comemso system for your application.

General

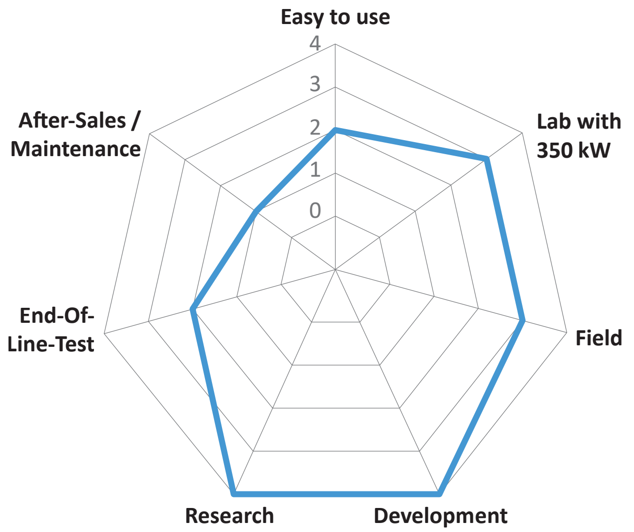
Mobile suitcase version



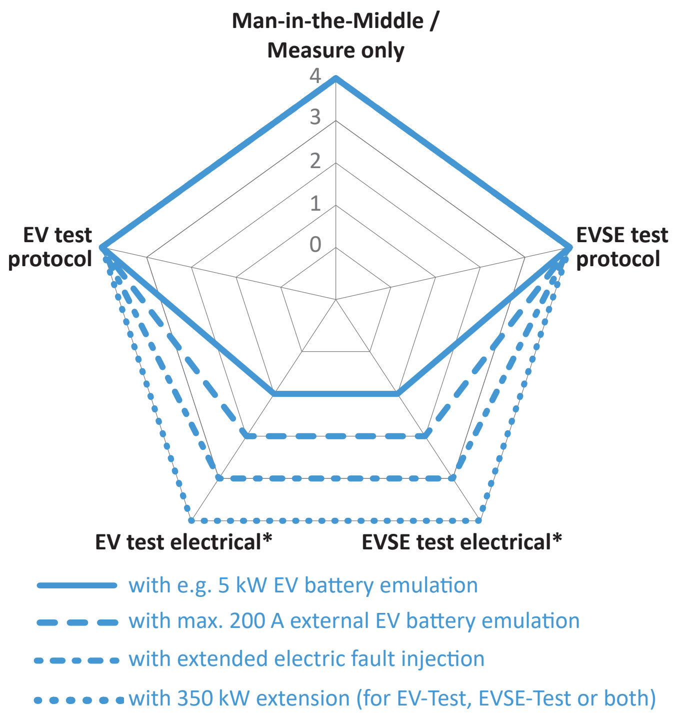
Laboratory rack version



Mobile rack version



Applications



*The 350 kW device may cause limitations in other applications.

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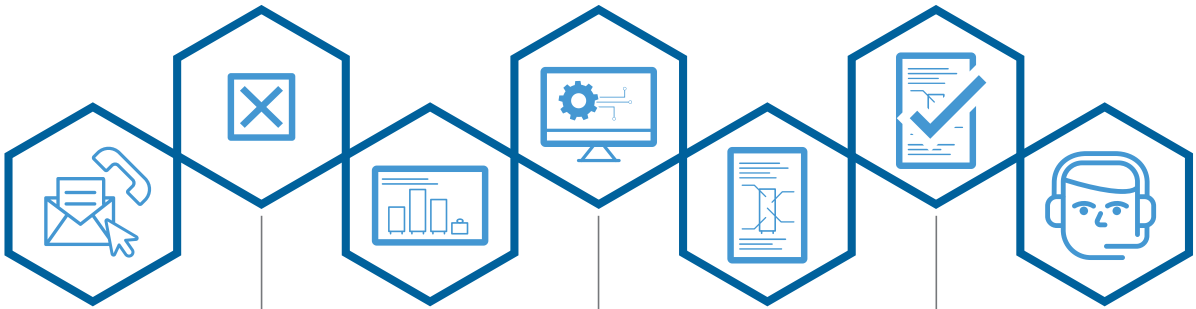
Get the perfect matching system and software for your application.

How to order a system with your requirements.



STEP 1
Send us an inquiry with your rough needs.

STEP 2
Below you will find some questions in which you check the possibilities and mark your selection.

STEP 3
After receipt of the completed questions our sales engineer will arrange an online meeting to discuss your needs. *Our intention: to find the best solution according to your budget!* After that we will create a draft system image.

STEP 4
Get an online demo of your selected function and features. We verify your configuration together.

STEP 5
We will send you our quotation including the final system solution.

STEP 6
After confirmation of our quotation you will receive an order confirmation and the desired system will be built.

STEP 7
Our sales department organizes an internal kick-off meeting for the production. A project manager keeps close contact with you, so that you receive your perfect system.

Space for your notes.

For details and individual configurations, please contact: sales@comemso.de

comemso´s objective:

Make complex charging processes
easy to analyse and test!

Please scan or photograph the completed sheet and send it to sales@comemso.com. Alternatively, you can download a PDF file from www.comemso.com/EVCA_Specification_Sheet.pdf.

Specification sheet for EV Charging Analyzer/Simulator.

In order to provide you with the most accurate offer possible, we kindly ask you to answer the following questions about your technical requirements:

Company: ______________________ Name: ______________________

Department: ______________________ Mail: ______________________

Street: ______________________ Phone: ______________________

ZIP/City: ______________________ Country: ______________________

A. I am a: ☐ EV manufactor ☐ EVSE manufactor ☐ Testing Laboratory/Service ☐ EVSE maintenance
☐ Integrator ☐ Other: ______________________

1. For which charging standards is the system supposed to be used for?
☐ AC ☐ DC-CCS ☐ CHAdeMO ☐ DC China (GB/T)

2. Which plug types shall be supported?
☐ AC Type 1 ☐ AC Type 2 ☐ AC GB/T ☐ Combo 1 ☐ Combo 2

3. Do you intend to do an EV or EVSE simulation or do you want to measure as "Man-in-the-Middle" between EV and EVSE?
☐ EV simulation ☐ EVSE simulation ☐ Man-in-the-Middle

4. For what purpose is the system intended?
☐ Development ☐ After-sales Diagnostics (root cause analysis) ☐ After-sales Testing (e.g. after manufacturing or maintenance)
☐ End-of-Line Test ☐ Testing lab ☐ EMC lab

5. Which test libraries you need?
CCS: ☐ IEC 61851-1 (AC) ☐ ISO 15118-4 ☐ ISO 15118-5 ☐ DIN 70122 ☐ CharIN test cases
CHAdeMO: ☐ Ch. 0.9 ☐ Ch. 1.1, 1.2, 2.0 ☐ EV 1.1
DC-China: ☐ EV GB/T 34657.2 DC (6.2) ☐ Ch. GB/T 34657.1 DC (6.3) ☐ EV GB/T 34658 DC (7.4) ☐ Ch. GB/T 34658 DC (7.5)

6. What power do you need for the source and load if an EV or EVSE simulation is planned?
__________ kW (max. 200 A possible)

7. Do you already have a source / load or do you want to get these components from us?
☐ I am already equipped ☐ Make me an offer

8. What is your project budget?
______________________ €/$

9. Is an extension planned in the next 1-2 years?
☐ Yes, please consider it in the offer. ☐ No

If a source / load already exists, can you tell us the model and manufacturer name?
We are glad to check the compatibility and integration possibilities in our system.
Brand: ____________ Type: ____________ Control Interface: ____________

Can you provide us with any further information about your application and requirements?
For example: plans for later extension possibilities and/or required standards.

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Devices for mobile and rack use as well as for all standards available worldwide. Devices and components shown in the brochure are examples. The actual appearance differs depending on the chosen variant.

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