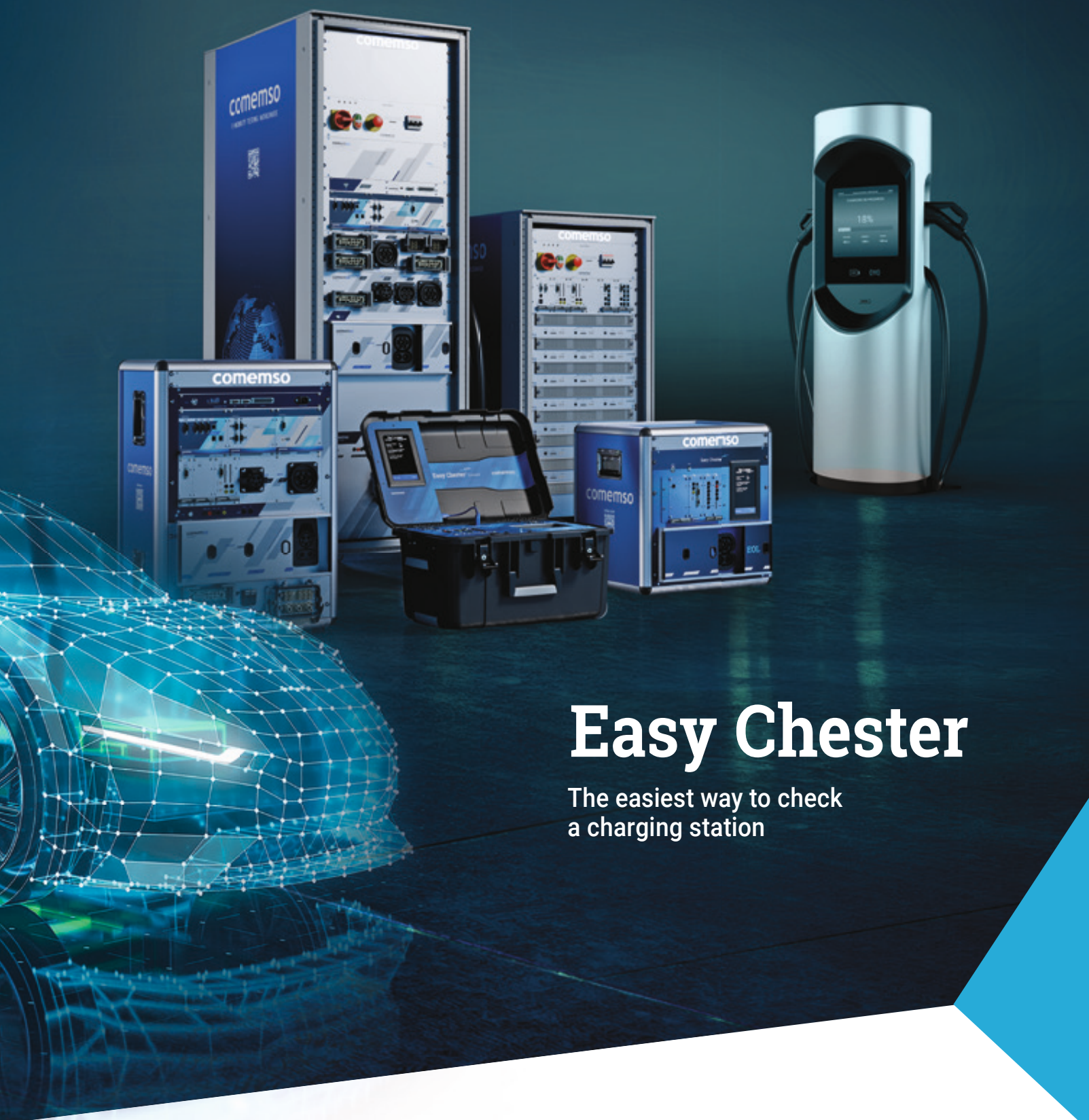
comemso



Easy Chester

The easiest way to check
a charging station

15 years of excellence

comemso

From charging process knowledge to display

For the future of e-mobility, it is essential to create trust in reliability, precision and standard compliance of the charging infrastructure. The comemso product range offers the right solutions for all test requirements with superior measurement accuracy, mobile application options and an expandable, flexible architecture from simple functional testing, calibration and standard compliance testing to complex test applications for research and development.

These customised solutions meet all the challenges for future-oriented e-mobility technology.

"comemeso aims to drive the developement of analysis and testing systems. Always to offer its customers the best solution.

Inspectation of charging station.

Easier as it seems.

After commissioning, repairing or maintenance the functionality and safety of charging points has to be tested. The complete inspection of a charging station consists four different steps:
Step 1 – Visual inspection
Step 2 – Functionality
Step 3 – Effectivity of protective measures
Step 4 – Preparation of a test report

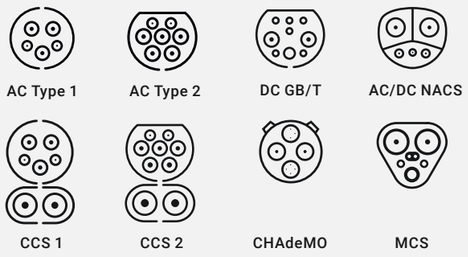
Examiner
The testing of a charging system for electrical safety and functionality must be carried out by a skilled person with basic knowledge of assessing the measured values and testing DC and AC charging systems.

Functionality
Carry out the function tests by using one of the comemso Easy Chester® – BASIC, EXTENDED or PRO.

Effectivity of protective measures
Performing all the measurements necessary for testing the effectiveness of protective measures, use the comemso Easy Chester.

Test report
The test report of the complete inspection to a charging station has to be documented in accordance to DIN VDE 0100-600. Easy Chester® creates an individual separate test report and automatically save it on the SD Card. The report can be exported via USB as legally PDF-File.

Plugtypes and their Character



Global charging standards worldwide

The wired charging of electric vehicles (EVs) with direct current (DC) is generally supposted to fast charging.

In the system standard DIN EN 61851-1 (VDE 0122-1) charging mode 4 is defined for DC charging at permanently installed charging stations. This charging mode offers a high level of electrical safety and protection of the charging station against overloading. This contributes to fire protection among other things. More functions to increase safety are the locking of the charging plug connection during the charging process named gun lock or locking function and a special communication interface for DC charging.
The interface is used to communicate between the electrical vehicles and the charging station and also to control the charging process.

DC charging standards get established worldwide:
DC CCS 1 (Combo 1), DC CCS 2 (Combo 2),
DC NACS, CHAdeMO, DC GB/T.

CCS – Combined Charging System
CCS is a universal charging system for electric vehicles. The CCS connection offers the option of both – AC charging and DC charging and is based on the international standards IEC 61851-1, IEC 61851-23, Annex CC and IEC 61851-24 for the charging equipment.
The standards for charging connectors are defined in the international standard IEC 62196 (configuration EE and EF). DIN 70121 and ISO 15118 standards describes the extended communication required for DC charging. Further the electrical safety of EVs is regulated in the ISO 17409 standard.

CHAdeMO
CHAdeMO is a Japanese charging standard - the first charging standard to be established for DC charging of electric vehicles.

NACS – North American Charging Standard
This charging method enables charging with direct current or single-phase alternating current. Additional technology in the electric vehicle is used to detect whether charging is taking place - Direct or alternating current.

Standards and referencen

Tests and Test Intervals
The contents of tests and test intervals are based on standards such as DIN EN 61851-1/22/23/24 (VDE 0122-1/2-2/2-3/2-4), ISO 15118-1, DIN 70121, IEC 60364-6/DIN VDE 0100-600, EN 50110-1/DIN VDE 0105-100, as well as manufacturer and installer instructions. Depending on the installation location and type of use there are special legal requirements. Further information can be found in the Occupational Health and Safety Act, the operating regulations, the guidelines of the ZVEH and the accident prevention regulations of the employers' liability insurance associations.

Measuring and Testing Devices
The prescribed, recurring tests serve to maintain the required high safety standards of the charging points. The measuring and testing devices used must not only comply with the above-mentioned standards for the various charging standards, but also with all relevant manufacturer and device standards. The standard DIN EN 61557 (VDE 0413-1: 2007-12) generally regulates electrical safety in low-voltage networks up to 1000 V AC and 1500 V DC and specific requirements for devices to test, measure or monitore protective measures. The IEC 61010-1 standard (Safety requirements for electrical equipment for measurement, control and laboratory use) regulates the classification into the measurement category. The measurement category specifies the permissible areas of application of measuring and testing devices for electrical equipment and systems for use in low-voltage networks.

Testing the effectivity of protective measures
For testing the effectivity of protective measures at charging points, the following standards are applicable:

- IEC 60364-6 (DIN VDE 0100-600; 2017-06, "Erection of low-voltage installations - Part 6: Tests")
- DIN EN 60204 (VDE 0113-1; 2007-06 "Safety of machinery - Electrical equipment of machines - Part 1: General requirements")
- DIN VDE 0100-410: 2018-10 Part 4-41 "Protection against electric shock"
- DIN EN 61140 (VDE 0140-1; 2016-11, "Protection against electric shock - Common requirements for systems and equipment")
- DIN IEC/TS 60479-1 (VDE 0140-479-1; 2007-05, "Effects of electric current on humans and domestic animals - Part 1: General aspects")
- IEC 60364-5-54 (DIN VDE 0100-540; 2012-06, "Erection of low-voltage installations - Part 5-54: Selection and erection of electrical equipment - Earthing systems and protective conductors")
- IEC 60364-4-41 (DIN VDE 0100-410; 2018-10, "Erection of low-voltage installations - Part 5-53: Selection and erection of electrical equipment - Switchgear and controlgear")
- IEC 60364-7-722 (DIN VDE 0100-722; 2019-06, "Erection of low-voltage installations - Part 7-722: Requirements for special premises, rooms and installations - Power supply for electric vehicles")
- DIN EN IEC 61851-1 (VDE 0122-1:2019-12 "Conductive charging systems for electric vehicles")
- EN 50110 (DIN VDE 0105-100; 2015-10, "Operation of electrical installations - Part 100: General requirements")
- IEC 60364-6 (DIN VDE 0105-100/A1; 2017-06, "Operation of electrical installations - Part 100: General requirements; Amendment A1: Periodic inspections")

comemso
supported measurements

- Protective conductor resistance in accordance with VDE 0100-600, VDE 0113-1 and VDE 0413 (measurement with test current 0.2 A or 25 A)
- Insulation resistance in accordance with VDE 0100-600, VDE 0113-1 and VDE 0413 (measurement DC voltage 250 V, 500 V, 750 V, 1000 V).
- Insulation resistance between active conductors (e.g. L1 - L2 or L1 - N or DC+ - DC-) and between active conductors and protective conductor (e.g. L1 - PE or N - PE or DC+ - PE)
- Residual voltage in accordance with VDE 0113-1 (measurement of the voltage/energy between live poles after disconnection from the charging plug).
- Contact current via voltage-free, conductive parts in accordance with VDE 0122-1
- Testing of residual current devices in accordance with VDE 0100-600, VDE 0113-1 and VDE 0413 (to prove that the protective device is switched off at the latest when the rated residual current of either 30 mA, 100 mA or 300 mA is reached).

Easy Chester®

Basic
Extended
Pro

Handling
Selection of all tests and settings via the touchscreen (three main menus with intuitive menu navigation).

Measuring Range
Voltage: 0 - 1.000 V; +/– 1 V resolution
Current: 0 - 200 A; +/– 0,1 A resolution

Accuracy
Voltage: +/– (1 V + 0,5 % of measured value)
Current: +/– 0,5 A

Inlets
Automatic detection of the charging procedure based on the inserted charging gun:

- Easy Chester® Basic:
  1 Inlet, DC CCS 1 or DC CCS 2
- Easy Chester® Extended and Pro:
  Up to 2 inlets freely selectable: CCS 1, CCS 2, NACS, CHAdeMO

Supported Charging Standards and Standard Conformity
CCS 1, CCS 2 (AC, DC): DIN 70121, ISO 15118, IEC 61851-1, CHAdeMO (DC) up to version 2.0, NACS (DC): SAE J3400

Built-In Safety
Automatic charging plug locking at voltages above 50 V (DC CCS, NACS), emergency release function, additional earthing connection, function monitoring of all internal modules with LED indicator strip.

Selftest and Zero Offset Calibration
A device self-test can be done at any time to check the functionality. There is also a function for calibrating the zero offset.

Fault Simulation during Charging
The following fault simulations are used to check if the charging station stops charging: PE cable break, CP short circuit, PP short circuit, PP cable break.

DC-Insulation Fault: Simulation during Cable Check
Insulation test for testing the insulation monitoring of the charging station (DC CCS): Test with predefined resistance values in the range from 47 kOhm to 780 kOhm.

AC-Insulation Fault
Insulation test to check the insulation monitoring of the charging station (AC): Test the phases L1, L2, L3 to PE with 2.5 kOhm. The fault is simulated after five seconds in the charging loop.

Software
Always up to date with firmware and software updates. Comments and your own company logo can be added to the measurement reports and exported as a PDF.

Extensions
Several optional extensions are available for the Easy Chester® Pro. For longer testing: The Long Duration Unit with 1.8 kW for test times of up to 60 minutes and the 30/60 kW load for unlimited testing.

CE Easy Chester® Pro

CE Easy Chester® Extended

CE Easy Chester® Basic

Easy Chester®

EOL
EOL HPC

The Easy Chester EOL (End-of-Line) and the Easy Chester EOL HPC (High-Power-Charger) are used to test the functionality of charging stations. Both variants support end-of-line tests of charging stations with plugs from DC CCS Combo 1 + 2, DC NACS, CHAdeMO, AC Type 1 + 2 are used in production and customer service. The system test the standard-compliant function of charging stations.

CE EOL

CE EOL HPC

In addition to the functions of the Easy Chester product family, the following functions are possible:

Different sources/ loads for Long-term-testing
Test with up to 500 A and 1,000 V with an external battery emulator or bidirectional DC sources (offered separately by comemso). Various charging time limits are possible for long-term tests for long-term tests.

Test in continuous operation
Active cooling for up to 8 hours of continuous operation.

Remote control via RS232 interface
Remote control with SCPI commands and REST API possible.

comemso Multiplexer (MUX)
The MUX enables the simultaneous connection of several charging pistols and automatic switching between the different inputs.

Optional Loads

Long Duration Unit
DC Load

Easy Chester®	Long Duration Unit	30kW / 60 kW Load
Variant	Case	Table Top
Plug and Play	●	●
1.8 kW resistive load	●	
30 kW / 60 kW resistive load		● / ●
Charging time	Up to 60 minutes	Unlimited
Compatible with	Easy Chester® Pro	Easy Chester® Pro

● integrated ○ optional

CE DC Load

CE Long Duration Unit

Made in Germany

What you see is what you get.

Easy Chester® features

ID	Feature		Easy Chester® Basic	Easy Chester® Extended	Easy Chester® Pro	Easy Chester® EOL	Easy Chester® EOL HPC
	Variant		Case	Case	Case	Tabletop	Rack
	Charging standard variants		1	up to 2	up to 2	up to 4	up to 4
i1	Opreation via touchscreen		●	●	●	●	●
i2	400V charging technology		●	●	●	●	●
i3	DC charging standard DIN 70121		●	●	●	●	●
i4	PDF test reports		●	●	●	●	●
i5	Connectivity: USB		●	●	●	●	●
i6	Isolated banana sockets for voltage measurement	DC	●	●	●	●	●
i7		AC		●	●	●	●
i8	Remote Control via RS232 interface – with SCPI commands and REST API					●	●
i9	Continuous operation					●	●
o1	800V charging technology			○	●	●	●
o2	Charging standard DC CCS type 1 – North America		○	○	○	○	○
o3	Charging standard DC CCS type 2 – worldwide, except North America		○	○	○	○	○
o4	DC charging standard ISO 15118		○	○	○	○	○
o5	Connectivity: Bluetooth		○	○	○	○	○
o6	CHAdeMO charging standard (Japan, Asia)			○	○	○	○
o7	Charging standard NACS (North America)			○	○	○	○
o8	AC charging standards IEC 61851-1 and ISO 15118			○	○	○	○
o9	Test case: Fault simulation / communication test / insulation tests (AC/DC)			○	○	○	○
o10	Compatible with Long Duration Unit / 30 kW Load				○ / ○	○ / ○	○ / ○
o11	ComISO for commissioning/recurring tests according to VDE standards				○	○	○
o12	Compatible with other DC loads						○
o13	MUX for automatic switching between different inlets						○

● integrated ○ optional

Easy Chester®

Calimera

Easy Chester® Calimera is designed to ensure that your charging station delivers accurate and reliable billing. Your customers enjoy the highest level of trust in every charging process and every transaction.

Verified accuracy
The Easy Chester® Calimera ensures the compliance with calibration legislation and provides reliable measurements and performs stationary in the laboratory and mobile in the field.

Extended measurement functionality
Integrated crossover measurement functions ensure high accuracy in every charging process and power range. Reach all test points below your performance characteristic in high granularity.

Mobil flexibility
Check your charging stations on site. Our mobile test system can be integrated into any trailer or van.

Price-performance
On customer request Configure the Easy Chester® Calimera to suit your projects and budgets. Its modular design offers the unique opportunity to grow with your project.

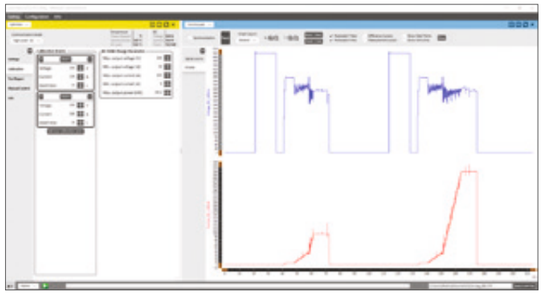
Industrial and field experience
Configure the Easy Chester® Calimera to suit your projects and budgets. Its modular design offers the unique opportunity to grow with your project.

Comprehensive software support
Easy Chester® Calimera's PC software comframe offers extensive features for user-friendly configuration, management, operation and monitoring.

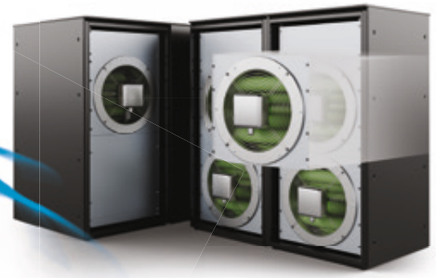
With the innovative cooling technology

coolflow technology

DAkkS Deutsche Akkreditierungsstelle



comframe software



Communication protocols

IEC 61851-1, DIN 70121 / ISO 15118 -2 / -3 with DC-CCS
IEC 61851-1, ISO 15118 -2/-3 with AC (1-/3-phase)
CHAdeMO 0.9 - 2.0 , NACS

Max. simulated loads

DC power rating	up to 240 kW (320 kW peak)
DC voltage / current	150 - 1.000 V ⎓ / 500 A ⎓
AC voltage	100 V - 240 V ∿
AC current	up to 3x 32 A / 1x 80 A ∿
Remark	3-phase ∿ measurements to be measured sequentially or at once

Measurement range / accuacy
Related to auxiliary power meter in temperature range 23°C+/-3K

DC charging station -	
voltage range	0 - 1000 V tmrs
accuracy	<0,1 % (full scale (FS), 0-10 Hz)
current range	0 - 500 A rms
accuracy	<0,1 % (full scale (FS), 0-10 Hz)
AC charging station -	100 .. 240 V rms (3x 1-phase)
voltage range	<0,1 % (full scale (FS), 45 .. 65 Hz)
Accuracy	0 .. 32 A rms
current range	<0,1 % (full scale (FS), 45 .. 65 Hz)
accuracy	

Made in Germany

More Products

EVCA Multi Mobile Flex
EVCA Flex

The EVCA Flex product line enables analyzing, manipulating and simulating for research and development purposes on both the EV and EVSE side. The company's own comframe software makes the complete communication between EV and EVSE visible.

Both EVCA variants combine the most common charging standards AC + DC CCS 1, AC + DC CCS 2, AC + DC NACS, CHAdeMO and AC + DC GB/T. The EVCA Flex is also prepared for MCS (Megawatt Charging) and supports up to 1000 A / 1 500 V.

Up to 2 AC and up to 4 DC inlets are available in one EVCA Multi Mobile Flex system; up to 3 AC and 4 DC inlets are available in one EVCA Flex system. The systems are ready for immediate use without the need to plug in or replace the inlets beforehand. As soon as the desired charging standard is set, the system measures and checks the communication and the load circuit for standard conformity over the entire charging time and logs any deviations.

Function Overview

- Measurements between charging station and electric vehicle: power, TrueRMS, signal quality, CP/PLC communication.
- AC/DC CCS EV/EVSE tests: Standard EV simulation (simulate, analyze, manipulate EV/EVSE, control external sources/loads).
- AC/DC CCS EV/EVSE: Professional EV simulation (plus edit, overwrite, send PLC messages, "charge playback": recording of data for later playback).
- DC CCS EV/EVSE: "Man-in-the-middle" with sniffer to read signals, messages and power between EV and EVSE.
- DC CCS EV/EVSE: "Man-in-the-middle" with gateway for reading all types of encryption and for targeted manipulation of communication ("manipulating gateway").
- Comprehensive interoperability tests.
- Testing, analyzing and manipulating complete charging cycles.
- Ensure smooth on-site communication between vehicle and charging station.

EVCA	Multi Mobile Flex	Flex
Variant	Table Top	Rack
Application Scenario	Field, laboratory, production	laboratory, production
AC Inlets	Up to 2	Up to 3
DC inlets	Up to 4	Up to 4
DC	Up to 1000 V and 200 A	Up to 1500 V and 1000 A
Software	comframe	comframe
Man in the middle	●	●
EV Test	●	●
EVSE Test	●	●
PDF test report	●	●
Remote control	●	●
Hardware Upgrades		●

● integrated ○ optional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