comemso



Easy Chester® Ultimate

Technical Datasheet

The Easy Chester® Ultimate is an all-in-one functional testing device for checking the safety and functionality of charging stations following commissioning, maintenance, servicing, or repair.

Handling
Selection of all tests and settings via the touchscreen with intuitive menu navigation.

Inlets
Automatic detection of the charging procedure based on the inserted charging plug.
Up to 2 inlets: CCS 1, CCS 2, NACS, CHAdeMO.

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

Built-In Safety
Automatic locking mechanism to lock the charging plug at voltages > 50 V (DC CCS, NACS, CHAdeMO), emergency unlock button, and functional monitoring of all internal modules with a status display.

Selftest
An automatic selftest of the device is performed each time it is switched on.

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

DC-Isolation Fault: Simulation during Cable Check (optional)
Isolation test for testing the isolation monitoring (IMD) of the charging station (DC CCS): Test DC+ to PE or DC- to PE with predefined resistance values in the range from 47 kΩ to 780 kΩ.

AC-Isolation Fault (optional)
Isolation test for testing the isolation monitoring (IMD) of the charging station (AC): Test the phases L1, L2, L3 to PE with 2.5 kΩ. The fault is simulated after 5 seconds in the charging loop.

Test report
- You can add comments, address fields, your company logo, and export a PDF file.
- Test result: PASSED or FAILED
- Detailed explanations of the individual measurement data
- Charging communication steps
- Voltage and current measurement
- Maximum charging power of the charging station
- MAC-PLC address of the charging station
- Safety test results

Software and Maintenance
If you purchase the maintenance package, you will get the following benefits:
- Firmware and software updates over the air (FOTA).
- The test report will include the test location, derived from the GPS coordinates and displayed as an address and map.
- Over-the-air remote maintenance is available, enabling our support team to assist you with troubleshooting.

You define:
- Region and charging standards
- Protocol requirements
- Safety test scope
- Extension needs for DC testing to extend charging time and/or power (LDU and DC Load)

Maintenance package:
- Remote support on the device – hotspot required (only during comemso's office hours)
- GPS data visualization: street/location + map
- Make photos of your EVSE optical inspection/damages and add to the report
- Firmware updates with new features (comfortable by FOTA – Firmware over the air)
- Further services in the report



Easy Chester Ultimate user interface (example)

Comprehensive testing of charging stations with just one device

Have you ever imagined that your e-mobility test system could have the same power supply interface as your smartphone?

- < 100 W power consumption
- USB-C power supply (20 V) or USB-C 12 V car adapter
- Optional: Use your own power bank with >100 W USB-C output (e.g., a „flight-safe" model)



Suitcase with wheels and a handle:
- Weight: 15.7 kg / 34.6 lbs
- Size : 60 x 33 x 40 cm / 24 x 13 x 16 inch

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Global Standards

Configure the Easy Chester® Ultimate by region: Europe, North America, or Asia.

AC/DC + Safety Tests

Test communication and charging (AC/DC), simulate faults, and perform safety tests – all with a single device.

Workflow

Guided operation, diagnostics, reports, Firmware Over-The-Air (FOTA) and remote support.

General specifications

Application	Portable device for mobile testing Charging test up to approx. 2 kW - Standard
Display	10.1 inch Touchscreen, Ultimate UI
Storage	128 GB
Connectivity and support	FOTA (Firmware Over-The-Air) – hotspot required. Send report via e-mail – hotspot and e-mail address required. Remote support on the device – hotspot required.
AC / DC voltage	Integrated isolated banana sockets
Measuring range	Voltage AC: 0 - 250 V Voltage DC: 0 - 1000 V; +/- 1 V resolution Current DC: 0 - 10 A; +/- 0.1 A resolution 0 - 200 A; +/- 0.1 A resolution (with external DC Load) CP voltage: -13 V to + 13 V; resolution 0.1 V PP resistor: 0 - 4600 Ω; resolution 1 Ω
Measuring accuracy	Voltage AC: +/- 0.1 V Voltage DC: +/- (1 V + 0.5 % of measured value) Current DC: +/- 0.5 A CP voltage: +/- 0.1 V PP resistor: +/- 2 % of measured value
Power supply	Power supply via USB-C, e.g., using a USB-C 12 V car adapter, or by using your own power bank with >100 W USB-C output (e.g., a „flight-safe" model).
Power consumption	Max. 100 W
Protection class	According to IEC 60529: IP 66 (closed case), IP 43 (opened case)
Electrical protection class	II (no accessible conductive materials and protective isolation)
Fuses	F 1.6/250E (Rated current 1.6 A, rated voltage 250 V, tripping characteristic F – fast-acting, response to overcurrent: rapid, breaking capacity E – enhanced, typical breaking capacity at 250 V AC: 150 A)
Temperature range	- 15 .. + 40 °C / + 5 .. + 104 °F
Dimension (WxHxD)	60 x 33 x 40 cm / 24 x 13 x 16 inch
Weight	15.7 kg / 34.6 lbs

Functional scope and configuration

Supported charging standards options	CCS 1 and CCS 2 (DC, AC optional), CHAdeMO up to Version 2.0, NACS (DC)
Norm conformity	DC communication: DIN 70121, ISO 15118-2, -3 (optional), SAE J3400, SAE J1772 AC testing: IEC 61851-1, SAE J1772, and ISO 15118-2, -3 (optional)
DC charging capacity and DC charging time	2 kW / 6 A for up to 45 sec. Optional: In combination with Long Duration Unit 2 kW / 6 A up to 60 minutes; with DC load 30 kW / 90 A up to 4 hours; with 2 DC loads 30 kW (60 kW in total) / 180 A up to 4 hours.
DC charging technology	400 V and 800 V technology – EV battery emulation with approx. 330 V and 660 V
Configuration	Up to 2 inlets available: CCS 1, CCS 2, NACS, CHAdeMO
Lock	Locking the charging plug at voltages > 50 V (DC CCS, NACS, CHAdeMO)
Fault simulation	AC/DC isolation tests as well as AC/DC communication and protocol tests, depending on the configuration and standard.
Electrical Safety Tests	VDE/IEC electrical safety and isolation tests (optional).
Field features	Improved thermal management, GPS, sound, dynamic light indicator / status display, auto selftest, lid bag, simple power setup.

Testing and validation functions

Communication faults AC/DC CCS and NACS	CP short, PP short (short circuit), PP cut, PE cut. All test cases as fault execution, verification if EVSE stops charging. Switch-off time not validated.
Communication faults CHAdeMO	CAN High and Low cut, CS2 cut. All test cases as fault execution, verification if EVSE stops charging. Switch-off time not validated.
DC Isolation fault simulation during cable check (optional)	Isolation test to check the isolation monitoring (IMD) of the charging station (DC). Various resistance values are available for the connections between DC+ and PE as well as DC- and PE: 780 kΩ, 690 kΩ, 600 kΩ, 500 kΩ, 475 kΩ, 400 kΩ, 300 kΩ, 200 kΩ, 95 kΩ, 50 kΩ, 47 kΩ.
AC Isolation fault simulation during charging (optional)	Isolation test to check the isolation monitoring (IMD) of the charging station (AC): Test the phases L1, L2, L3 to PE with 2.5 kΩ. The fault is simulated after 5 seconds in the charging loop.
Electrical safety tests for EV-side (optional)	• Isolation resistance (R_{ISO}) • Protective conductor resistance (R_{PE}) • Fault current (t_{RCD}) • Residual voltage (U_{OFF}) • Phase rotation (AC charger)
Electrical safety tests for grid-side (optional)	• Isolation resistance (R_{ISO}) • Protective conductor resistance (R_{PE}) • Fault current (t_{RCD}) • Loop impedance (Z_S) • Phase rotation

Electrical safety tests according to VDE/IEC

In total, there are 6 test cases conducted to verify electrical safety:

- Testing of the isolation resistance (R_{ISO}) between all phases, or between all active conductors and PE; this test may optionally be performed at 250 V, 500 V, 750 V, or 1000 V. Applicable standards: VDE 0100-600, VDE 0113-1, and VDE 0413 (DC voltage measurement at 250 V, 500 V, 750 V, 1000 V) between active conductors (e.g., L1 – L2, L1 – N, or DC+ – DC-) and between active conductors and protective conductors (e.g., L1 – PE, N – PE, or DC+ – PE).
- Testing of protective conductor resistance (R_{PE}) at 200 mA or 25 A. Applicable standards: DE 0100-600, VDE 0113-1, and VDE 0413.
- Fault current test (t_{RCD}) for AC/DC, selectable at 6 mA, 30 mA, 100 mA, or 300 mA; for AC, the fault current test can be performed for each of the phases L1, L2, and L3. Applicable standards: VDE 0122-1; VDE 0100-600, VDE 0113-1, and VDE 0413 (testing of residual current devices).
- Residual Voltage Test (U_{OFF}): For this test, a standard charging process is first performed, at the termination of which the disconnection of the charging plug is simulated by switching off the PP resistor. The measurement is then carried out. The test is passed if the voltage drops below 30 V true RMS (AC) or 60 V (DC) within less than one second. Applicable standards: VDE 0113-1 (Measurement of voltage and energy between current-carrying poles following the disconnection of the charging plug).
- Determination of Loop Impedance (Z_S): A defined test current (15 mA/15 A) is briefly injected between the phase conductor and the protective conductor (or neutral conductor), and the resulting voltage drop is measured. The loop impedance is subsequently calculated from the ratio of voltage to current.
- Determination of phase rotation

Optional DC Loads

Long Duration Unit (LDU)
DC Load 30 kW

The Easy Chester Ultimate can optionally be connected to the Long Duration Unit (LDU) or the 30 kW load. In addition, the 30 kW load is stackable for up to 60 kW.

Use Cases
Backend and billing verification, long-term stability, load balancing, PE connections, recurring service incidents, and in-depth validation following repairs or firmware updates.



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Easy Chester®	Long Duration Unit	30kW / 60 kW Load
Variant	Suitcase	Trolley
Plug and play	●	●
DC charging technology 400/800 V	● / –	● / ●
Resistive load 2 kW / 30 kW / 60 kW	● / – / –	● / ● / ●
Charging time	Up to 60 minutes	Up to 4 hours

Specifications Long Duration Unit

Power consumption	Max. 50 W – inrush current might be higher
Protection class	IP 66 (closed case), IP 43 (opened case)
Weight	15 kg / 33 lbs
Dimension (WxHxD)	60 x 33 x 40 cm / 24 x 13 x 16 inch

Specifications DC Load 30 kW

Current sensor	0 - 500 A
Resolution	6 A (software control function)
AC supply	100 - 245 V AC
Power consumption	Max. 90 W – inrush current might be higher
Protection class	IP 20
Weight	About 66 kg / 146 lbs
Dimensions (WxHxD)	Ca. 80 x 87 x 50 cm / 32 x 34 x 20 inch

Easy Chester®

EOL
EOL HPC

The Easy Chester EOL (End-of-Line) and the Easy Chester EOL HPC (High-Power-Charging) are used to test the functionality of charging stations.

Both variants support end-of-line testing of charging stations (DC CCS Combo 1 + 2, DC NACS, CHAdeMO, and AC Type 1 + 2) and are used in both production and customer service. The system tests the function of charging stations.

EOL HPC



EOL



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Easy Chester®	EOL	EOL HPC
Variant	Table Top	Rack
Plug and play	●	●
AC/DC	● / ●	● / ●
DC charging technology 400/800 V	● / ●	● / ●
Load configuration	Resistive DC load 2.5 kW	Electronic load Power depending on your selection
Duration of charging cycle	DC: 5 sec up to 60 min AC: 5 sec up to 90 sec	DC: continuous AC: continuous

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

Remote control via RS232 interface
To integrate the devices into the production environment, remote control via SCPI commands and REST API is possible.

comemso Multiplexer (MUX)
The MUX enables the simultaneous connection of several charging plugs of one EVSE and switching between the different plug types.

Use cases for the EOL and EOL HPC
The comemso Easy Chester EOL and Easy Chester EOL HPC are specifically developed for production-line environments. Their primary purpose is to perform automated end-of-line functional testing, ensuring that every charging station leaving the factory operates correctly and complies with relevant charging standards. With the EOL HPC, you can test using an AC or DC electronic load to test the EVSE under load conditions for an extended period of time.

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.

Mobile flexibility
Check your charging stations on site. Our mobile testing system can be integrated into any trailer or van – or, for the US version, into a pickup truck. In addition, various power meters can be used that can be calibrated according to ISO 17025.

Experience and 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.

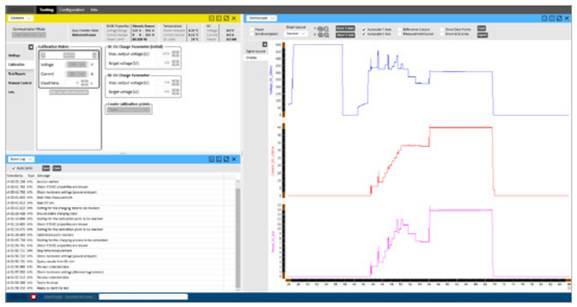
Comprehensive software support
Easy Chester® Calimera's PC software comframe offers extensive features for user-friendly configuration, management, operation, monitoring, and reporting.

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Calimera

DAkkS Deutsche Akkreditierungsstelle



comframe software

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Communication protocols

IEC 61851-1, DIN 70121, ISO 15118 -2 / -3, and SAE J1772 with DC-CCS; IEC 61851-1, ISO 15118 -2/-3, and SAE J1772 with AC (1-/3-phase), CHAdeMO 0.9 - 2.0 , SAE J3400 with NACS

Max. simulated loads

DC power rating	up to 450 kW in boost mode
DC voltage / current	150 - 1.000 V ⎓ / up to 950 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 VDC
Accuracy	<0,1 % (full scale (FS), 0-10 Hz)
Current range	0 - 1000 A
Accuracy	<0,1 % (full scale (FS), 0-10 Hz)
AC charging station -	
Voltage range	100 - 240 VAC (1-phase/ 3-phase)
Accuracy	<0,1 % (full scale (FS), 45 - 65 Hz)
Current range	0 - 120 A
Accuracy	<0,1 % (full scale (FS), 45 - 65 Hz)

More Products

EVCA Multi Mobile, EVCA Flex, EVCA interop

EVCA Flex



EVCA Multi Mobile



EVCA interop

The EVCA Flex product line enables measuring, analyzing, manipulating, simulating, and conformance testing for research and development purposes on both the EV and EVSE side. The company's proprietary software comframe makes all communication between the EV and the EVSE visible and graphically displays deviations from standard compliance. Most 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. A separate MCS EVCA is also available.

Once the desired charging standard has been set, the system measures and checks the communication and the load circuit for standards compliance throughout the entire charging process, logging any deviations or executing test cases regarding protocols, communication, electrical safety, and robustness.

Function Overview
Measurements between charging station and electric vehicle: power, TrueRMS, communication signal quality, CP/PLC/PP 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 or delay 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 and get automated analysis.
- 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 with automated standard compliance analysis.
- Testing, analyzing and manipulating complete charging cycles.
- Ensure smooth on-site communication between vehicle and charging station, without the need of firmware change of EV or EVSE.
- No data losses as Man-in-the-Middle as it often happens with inductive capturing.

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

*)Only with Combo 1/2 ● integrated ○ optional



" For many years, comemso has set itself high standards in the development of test and validation systems in order to deliver optimal solutions for its customers."

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16 years Innovation

Understanding and simulating test processes

For 16 years, comemso has been developing test systems to optimize e-mobility systems. Today, we are more determined than ever to continue enriching the electric mobility market with innovations. To find the best possible solution, we always carry out our own practical tests. The insights gained from these tests are directly incorporated into the development of new solutions and products.



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