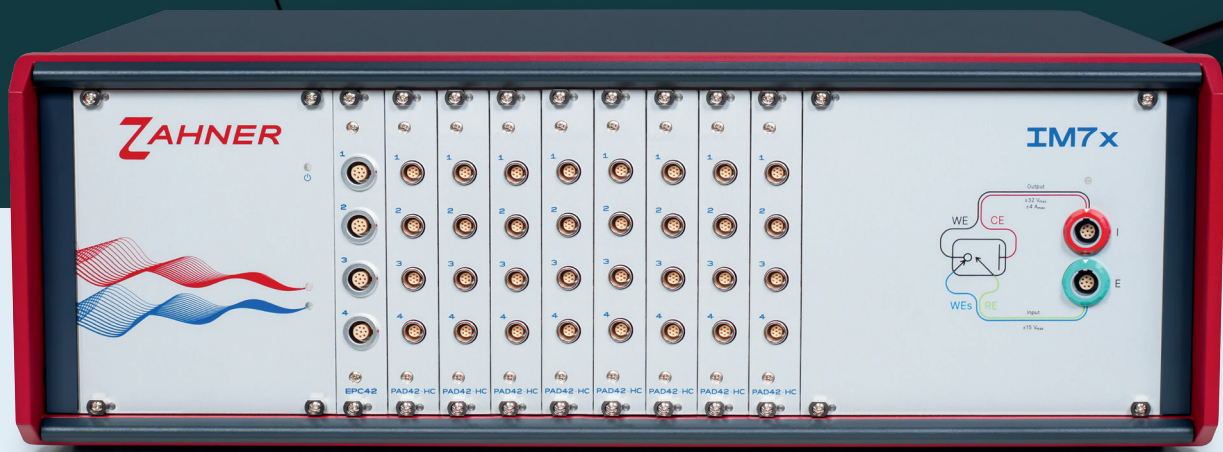


ZAHNER

PRECISION IN ELECTROCHEMISTRY



ZAHNER POTENTIOSTATS – Made in Germany

POWER POTENTIOSTATS

EIS-CAPABLE SYSTEM TO CHARACTERIZE
BATTERIES, FUEL & ELECTROLYZER CELL STACKS



Medium Power Extension

- Max. current (up to 40 A)
- Max. power (up to 200 W)

High Power Extension

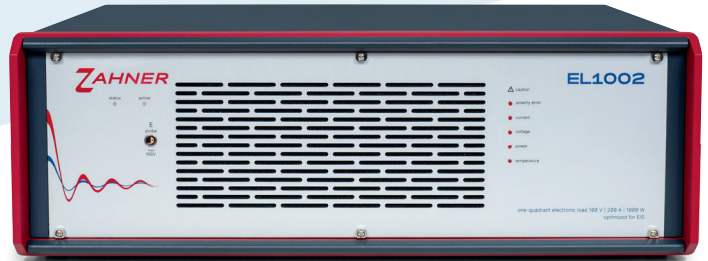
- Max. current (up to 680 A)
- Max. power (up to 68 kW)

PAD42

True synchronous measurements on individual cells in a stacked system

EL1002

The Dynamic Electronic Load For EIS



Main Specifications

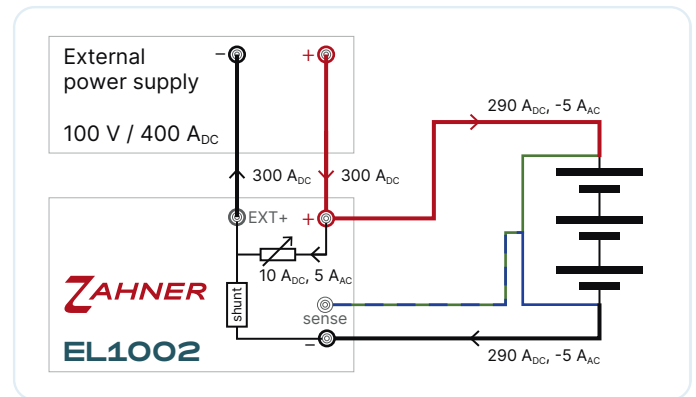
- Max. current: up to 200 A
- Unique current scalability concept: up to ± 680 A
- Max. voltage: up to 100 V
- Max. power: up to 68 kW
- EIS frequency range: 10 μ Hz – 100 kHz
- Remote integration possible via C++, Python and WebSockets

Operation Modes

The EL1002 can carry out EIS on various test objects using different operation modes* like

- Fuel cell operation
- Electrolysis cell operation
- Charging, discharging and SOC operations of a battery stack

The schematic shows an EL1002 in EXT-mode connection scheme with an external power supply. The current through the test object is controlled by EL1002. The electrolysis current of 290 A is flowing through the test object.



Specifications

Potentiostatic modes	potentiostatic, galvanostatic, OCP
Cell connection	2-, 3-, 4-terminal sensing
Ground reference	floating
Maximum voltage	100 V
Maximum current	200 A
Maximum current (in EXT mode)	± 680 A (with 3rd party power supply / load)
EIS power dissipation	1000 W
Input impedance	100 k Ω
Maximum current accuracy	± 68 mA $\pm 0.1\%$ of reading
Maximum voltage accuracy	± 500 μ V $\pm 0.1\%$ of reading

General

Interface	EPC42, USB (Standalone mode)
Dimensions / Weight	160 × 470 × 485 mm ³ / 21.5 kg
Power supply	100/115/230 VAC, 50/60 Hz
Ambient temperature / Humidity	10 °C to 30 °C / < 60% without derating

* The EL1002 may be used with an external power supply or a load. The EL1002 may be connected in parallel or series to the external device. Different configurations offer different functionalities which are explained in the EL1002 manual.

Access
the EL1002
manual using
the QR code:



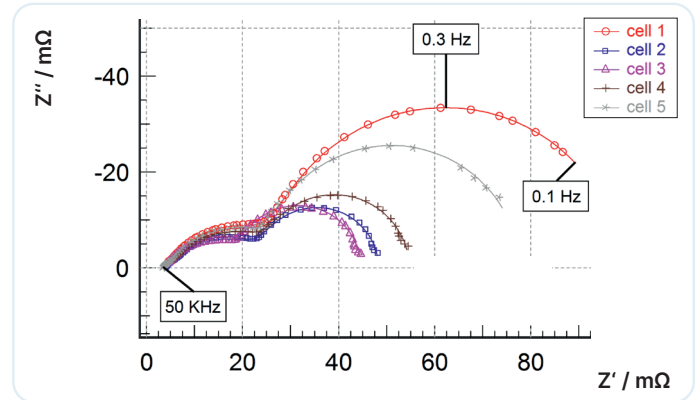
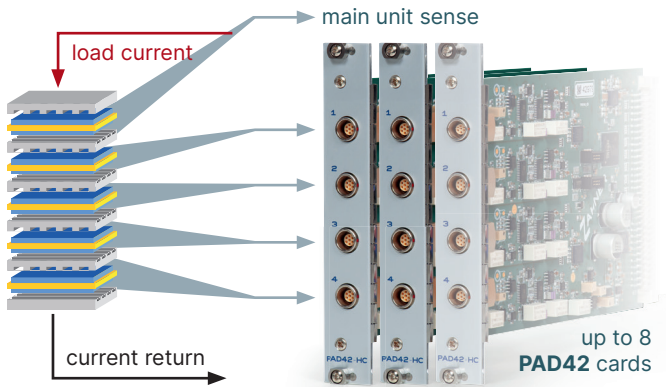
PAD42

True Synchronous Measurements for Stack-, Cell- and Electrode-level Characterization.

- Designed for use with IM7, IM7x, PP2X2 and EL1002
- IM7 can be equipped with one PAD42 card, providing up to 5 channels
- IM7x can be equipped with up to eight PAD42 cards, providing up to 33 channels

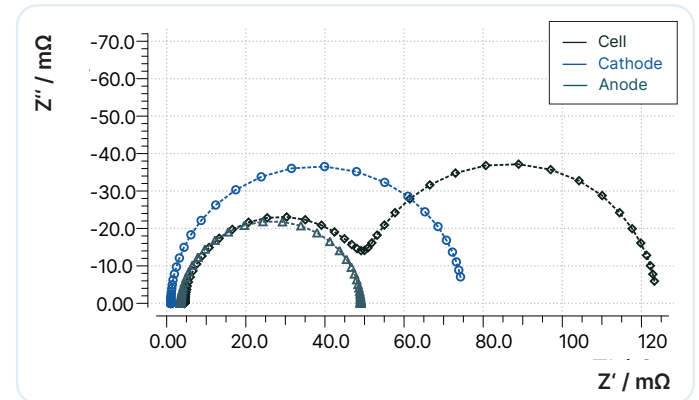
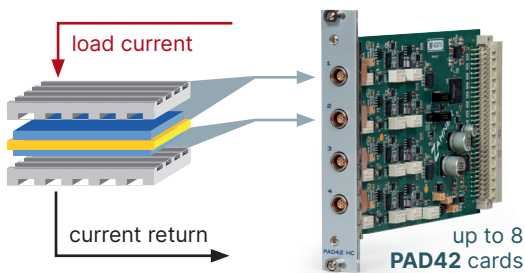
Stack-level Characterization

Synchronous measurements on each cell in a stack



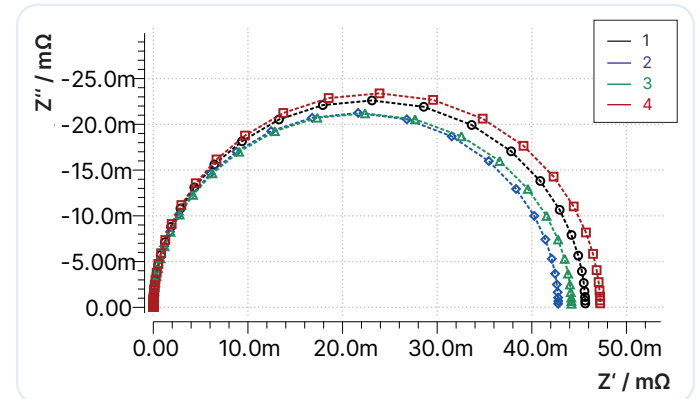
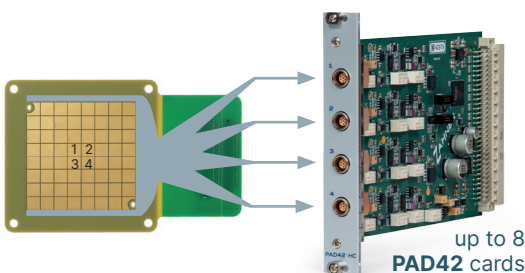
Cell-level Characterization

Synchronous half-cell measurements for reference electrode setups



Electrode-level Characterization

Synchronous cross-sectional analysis with segmented shunts



Specifications

Number of channels: 4 individually addressable
 EIS frequency range: 10 μ Hz - 1 MHz
 Resolution: 24-bit

Card Type	PAD42-HC	PAD42-HZ
Input voltage range	± 5 V (standard), ± 25 V, ± 37.5 V, ± 50 V	± 5 V
Common mode range	± 150 V (standard), ± 500 V, ± 750 V, ± 1000 V	± 10 V
Input AC voltage resolution	6.4 nV	6.4 nV
Input impedance	200 k Ω	> 100 G Ω

Power Potentiostats

200 W Potentiostat For High-Precision Electrochemistry



PP212

- ±10 A over 4 current ranges
- ±20 V voltage range



PP222

- ±20 A over 4 current ranges
- ±10 V voltage range



PP242

- ±40 A over 4 current ranges
- ±5 V voltage range

Specifications

Potentiostatic modes	potentiostatic, galvanostatic, OCP
Cell connection	2-, 3-, 4-terminal sensing
Ground reference	grounded, floating
Output power	200 W
Power dissipation	250 W
Frequency range	10 μ Hz - 400 kHz
Input impedance	2 M Ω (PP212), 100 M Ω (PP222 & PP242)
Maximum voltage accuracy	$\pm 500 \mu$ V \pm 0.1% of reading
Maximum current accuracy	$\pm 400 \mu$ A \pm 0.2% of reading

General

Interface	EPC42, USB (standalone)
Dimensions / Weight	160 × 364 × 378 mm ³ / 10.2 kg
Power supply	100/115/230 VAC, 50/60 Hz
Ambient temperature / Humidity	10 °C to 30 °C / < 60% without derating

Standalone Mode

The PP2X2 or the EL1002 can either be used as an extension of an IM7 potentiostat (EPC-mode) or in standalone mode. In the standalone mode, simple DC measurements can be carried out directly with the PP2X2 or the EL1002 via Python. Multiple PP2X2 and/or EL1002 units can be controlled via a single computer, emulating a high-quality multi-channel system. Multiple PP2X2 and EL1002 units in a standalone mode can also be interfaced with an IM7 potentiostat via an EPC42 card and can also carry out EIS sequentially.



Check out the QR code for useful examples and complete API documentation.



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