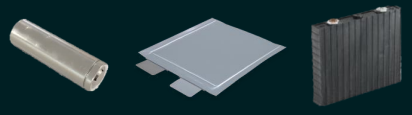
Research & Development

# Inspectrum.C

## Next generation of battery characterization

- Simultaneous measurement of up to 32 impedance points
- Ultra-fast measurement with unprecedented precision
- Easy process integration and intuitive to operate
- Embedded spectrum calculation and validation
- Highly efficient switched-mode design:
  No active cooling, no heat sink,
  no maintenance
- CAN Bus & USB interface

For **all** cell geometries



For **all** cell chemistries

LCO LMO NMC LFP NCA LTO +


SAFION

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info@safion.de
www.safion.de

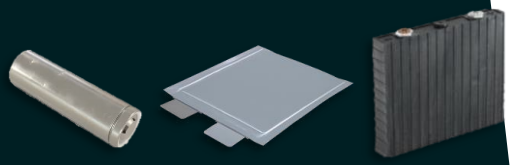
**Schedule a demo!**

# SYSTEM INTEGRATION


USB

PC

Inspectrum.C



Cell

Current
Voltage
Temperature

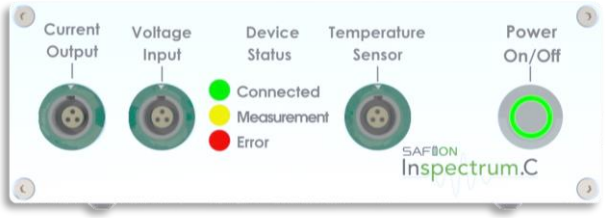
Battery Cycler

CAN

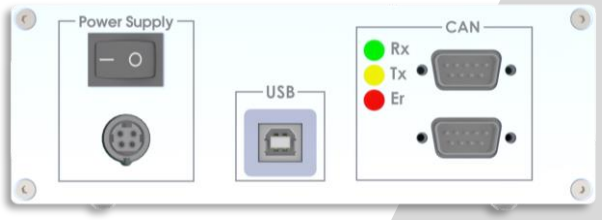
# SPECIFICATIONS

| Parameter | Value |
|---|---|
| AC current output (1 Hz – 10 kHz) | Max. 10 A (peak-peak) |
| AC excitation | parallel multi-sine, up to 32 frequency points |
| DC current output (charge and discharge option) | max +/-1 A |
| EIS measurement charge/discharge | Yes |
| EIS measurement during temperature change | Yes |
| Temperature Measurement Input | 1 CH RTD |
| DC voltage range | 1 - 5 V (0 V on request) |
| Frequency range | 10 mHz - 10 kHz |
| Accuracy frequency | 100 ppm |
| Interfaces | USB, CAN |
| Voltage Input Resolution (DC) | < 0.5 mV |
| Voltage Input Resolution (AC) | < 2 µV |
| Impedance range | 0.1 mΩ - 100 mΩ |
| Accuracy \|Z\| (typical, after calibration) | < 1 % |
| Accuracy arg(Z) (typical, after calibration) | < 0.5 ° |
| Input Power | < 60 W |
| Input Voltage | 12 VDC |
| Casing (W x D x H) | 165 x 240 x 55mm |
| Ambient temperature | +10°C to +30°C |

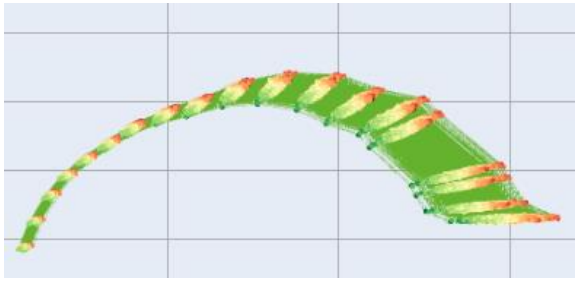
### Device front




### Device back




# ONLINE EIS MEASUREMENT



The electrochemical impedance spectrum (EIS) can be seen as the battery's fingerprint and contains highly relevant information to forecast future capacity, lifetime and performance within your application, and can provide precise information regarding cell quality. Though, typical EIS measurement systems are too slow to be used for large-scale screening of battery cells in a production environment.
The Safion online EIS method makes use of a superimposed excitation to measure up to **32 impedance points simultaneously**. This way for the first time EIS measurements can be performed under dynamic operating conditions as well as under abuse conditions. This allows the performance and safety limits of lithium-ion batteries to be measured with unprecedented accuracy, providing our customers with new insights for material, cell design and battery system development.

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