SAFION

THE FUTURE OF BATTERY TESTING
Inspectrum.20-80 MC

Detect electrical defects within your battery modules.
Improve module performance through high-speed rapidEIS testing.

- Test battery module quality within seconds
- Streamline your R&D process and time to market
- Mitigate risks of battery failures, costly recalls, and warranty claims

ES France - Département Puissance Energie
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45
e-mail : tem@es-france.com
Site Web : www.es-france.com

Innovative rapidEIS Technology

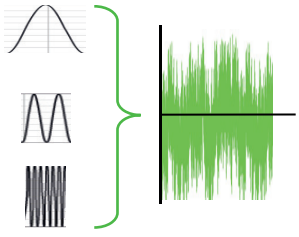
Accurately assign battery quality, lifetime, and capacity

Electrochemical Impedance Spectroscopy (EIS) is widely recognized as **the most reliable method to evaluate Li-ion battery performance and lifetime**. EIS is consistently superior and reliable compared to industry-standard tests like open circuit voltage (OCV), AC resistance at 1kHz (AC-IR), DC pulse methods, and capacity checks.

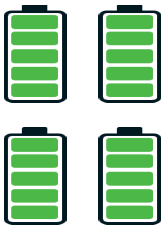
Key benefits of Safion's rapidEIS:

- ✓ Determine Li-ion battery performance and SOH within seconds
- ✓ Increase testing throughput and accuracy
- ✓ Ensure safety and performance of your batteries in the field

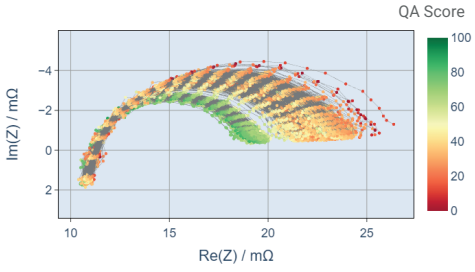
Concept of rapidEIS



Innovative rapidEIS for fast and accurate measurements



rapidEIS measurement of battery cells / modules



Reliable EIS-based inspection and grading of battery cells and modules

Inspectrum.20-80 MC

Measure module performance and state-of-health (SOH) with rapidEIS

Key benefits:

- ✓ Identify faults and defects in modules before pack assembly
- ✓ Ensure that battery systems meet your performance criteria
- ✓ Reduce risk exposure in battery systems deployed in-field

Product features:

- Perform rapidEIS on the entire module and individual cells
- Full-module electrical testing with instant SOH insights
- Depth of diagnostics at both module and cell levels

Module Current Excitation Unit

Perform rapidEIS excitation of modules with high speed and accuracy with up to 32 frequency points per measurement

Module Voltage Measurement Unit

Measure module impedance (EIS) parameters and identify welding and busbar issues

24-channel Cell Voltage Measurement Unit

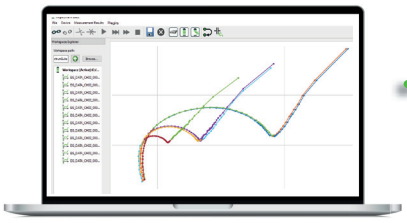
Measure cell-level EIS for precise, high-resolution fault-detection, and ensuring integrity of each cell within the module

ES France - Département Puissance Energie
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45
e-mail : tem@es-france.com
Site Web : www.es-france.com

Solution Architecture

Seamless integration in existing production and R&D processes

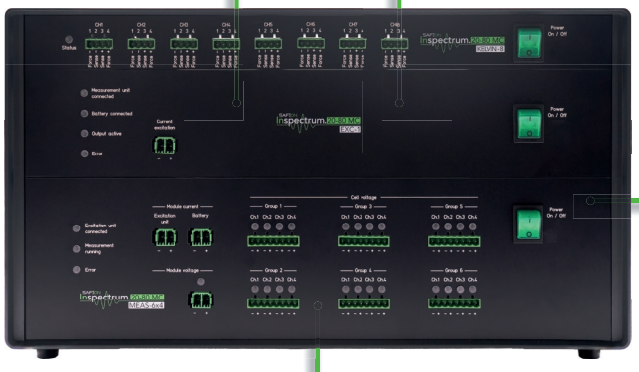
Inspectrum.Suite Software



USB

Ethernet

Production MES / Lab LIMS



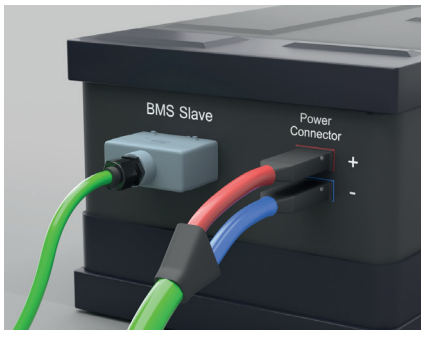
CAN

Cyclers

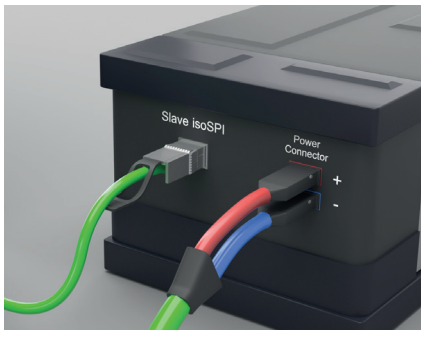
Module (DUT) connection

Direct cell-connection

BMS Slave



BMS isolated SPI

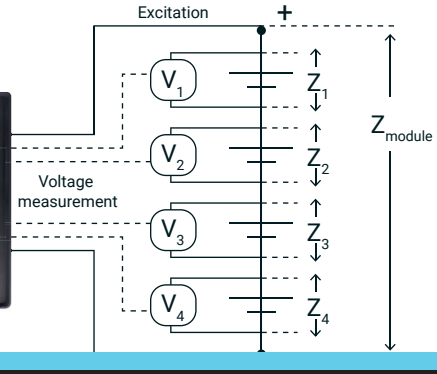


Measure module- and cell-level EIS

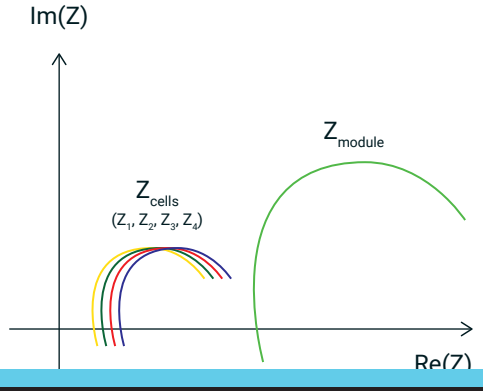
In-depth comprehensive insights into your module performance

Inspectrum.20-80 MC

Module (DUT)



Module and cell EIS

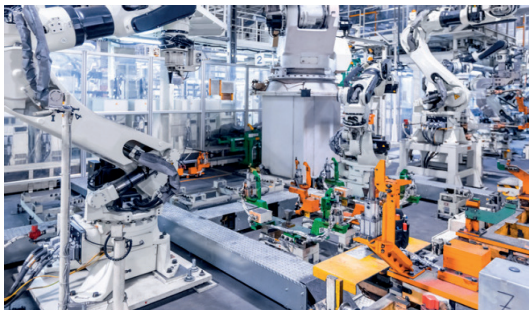


ES France - Département Puissance Energie
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45
e-mail : tem@es-france.com
Site Web : www.es-france.com

Applications

Battery module testing with innovative rapidEIS

Production

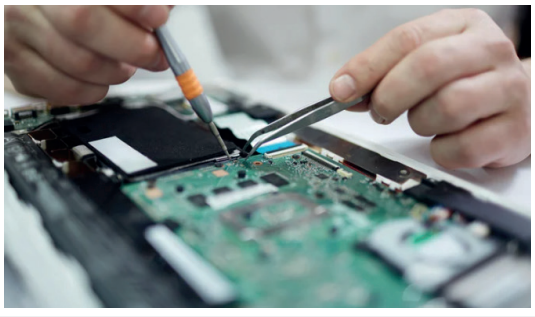


End-of-line (EOL) module inspection
Ensure high module performance and production capacity

Incoming goods inspection (IGI)
Easily identify quality issues of your suppliers

2nd Life module assessment
Assess the remaining lifetime and value of your modules

R&D



BMS validation
Validate your BMS chip design, architecture and algorithms

Module design and validation
Design and fine-tune your battery modules for mass production

Module characterization tests
Characterize modules fast and accurately to close the R&D loop

After-sales

In-field module assessment
Diagnose battery SOH and performance onsite with minimal downtime and effort

BaaS battery inspection
Rapidly assess battery SOH and performance for the growing battery-as-a-service (BaaS) industry

Specifications

Key Product Features	Specifications
Module voltages	18 – 38 V / 30 – 80 V
rapidEIS frequency range	10 mHz – 10 kHz
Cell channels	24
Excitation current	±10 A
Input power	1 kW
Power supply	200 – 240 V, 50 – 60 Hz
Communication	USB, CAN, Ethernet
Dimensions	483 x 89 mm (2U) x 550 mm
Ambient temperature	+10°C to +30°C

ES France - Département Puissance Energie
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45
e-mail : tem@es-france.com
Site Web : www.es-france.com