

BioLogic

Advanced
Battery Development

Electrochemical solutions for research and industry

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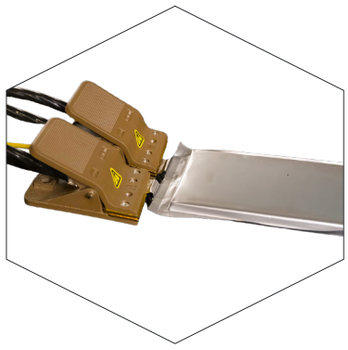
Your battery development challenges. Our proven solutions.



Battery development spans from fundamental research to full-scale validation & screening. Whether you're investigating new materials, validating prototypes, or optimizing performance at scale, we can help you optimize each stage with dedicated instruments and methodologies by providing solutions tailored to your research needs.







Materials & Components Research

Battery innovation starts at the material level. Standardized techniques and precise control enable reliable comparison of electrodes, electrolytes, separators, and interfaces. Our solutions ensure the accuracy and stability needed for reproducible component-level testing.

Research advantages

- Established electrochemical techniques for material benchmarking
- Synchronizable channels and multi-cell configurations for testing under identical conditions
- High-quality accessories for half-cell, coin, and pouch cell studies

Fundamental & Proof of Concept Studies

At this stage, researchers explore new chemistries, cell concepts, and mechanisms. Flexible experimental control and advanced analysis tools are essential for validating ideas, understanding behaviors, and establishing baseline performance. Our solutions support rapid iteration and in-depth investigation of emerging battery technologies.

Research advantages

- Versatile control and analysis techniques for novel chemistries and cell designs
- Advanced modeling and EIS tools to understand kinetics, degradation, and mechanisms
- Flexible configurations for custom cell formats, temperature control, and reference electrode setups

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Scale-up & Validation

As concepts mature, testing must reflect real-world operating conditions. Scaling from lab cells to pilot or module-level systems requires reliable instrumentation, robust protocols, and consistent data to validate performance, safety, and lifetime. Our solutions support seamless progression from research to pre-industrial testing.

Research advantages

- Scalable testing from single cells to multi-channel, module-level setups
- Precise control of cycling conditions, safety limits, and environmental parameters
- Long-term testing capabilities with consistent, traceable data for performance and durability validation

Screenings

Efficient screening accelerates discovery by enabling rapid comparison of materials, formulations, or operating conditions. High-throughput testing and automated workflows help identify promising candidates early, shortening development cycles and reducing cost. Our solutions are designed to support fast, reliable decision-making at scale.

Research advantages

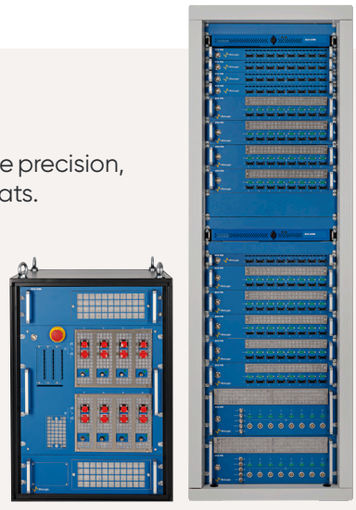
- High-throughput, multi-channel testing for rapid comparison of cells or materials
- Automated protocols and data analysis to speed up evaluation and ranking
- Consistent, reproducible testing conditions for accurate benchmarking across large sample sets

Our Premium Battery Cyclers

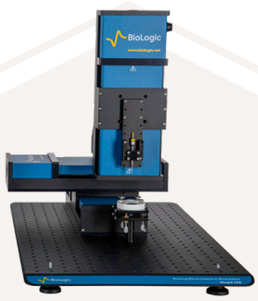
Premium battery cyclers are designed for advanced battery research, delivering the precision, flexibility, and reliability required to test a wide range of chemistries and cell formats.

Key advantages

- Integrated Native EIS for seamless testing during charge / discharge cycles
- High-accuracy current control: from µA to hundreds of A
- Wide voltage and current ranges for versatile testing across chemistries
- Fast and precise voltage/current response for capturing transient events
- Multi-channel synchronization for consistent testing of multiple cells in parallel
- Advanced safety and monitoring features for long-term cycling under real-world conditions



Battery Developement:
Innovation at every stage



M470
Scanning Electrochemical Workstation
- Customize up to 7 modules
- Measure local electrochemistry
- 110 mm range on all axis



VMP-300
Premium Potentiostat
- Up to 16 channels
- Up to 150 A
- EIS up to 11 MHz

Materials & Components

Fundamental & Proof of Concept

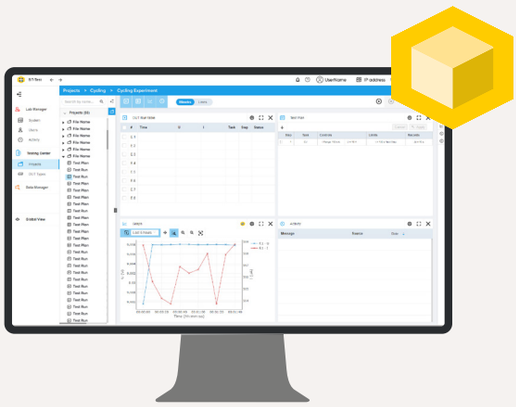


VMP-3e
Essential Potentiostat
- Up to 16 channels
- EIS up to 1 MHz



EC-Lab®
Potentiostat Control & Analysis Software
- Battery dedicated techniques & analysis
- Climate chamber control
- EIS QI™

FlexP
High-Power Booster
- Up to 800 A
- Up to 60 V
- Stack mode





MPG-2xx

Premium Research Grade Battery Cyclers

- Fast CC-CV shift
- Climate chamber management
- 3-electrode cells
- Negative voltage

BT-Lab® Suite

BCS Control & Analysis Software

- BT-Test™- Cycling control & monitoring
- BT-Analysis™ - Batch data processing
- BT-Clim™ - Climate chamber control

Scale up & Validation

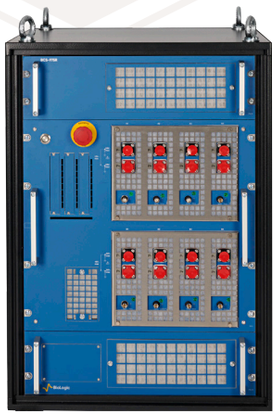
Screening



BCS-900 series

Premium Battery Cyclers

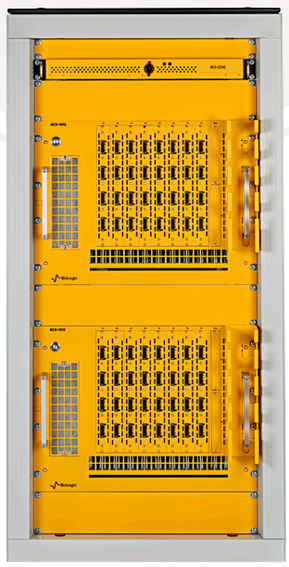
- 4 modules
- Up to 75 A / channel
- EIS up to 10 kHz



BCS-1012

Essential Battery Cycler

- High density
- 6 A
- 32 Channels in 8U
- Ideal for cylindrical cells



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Proven Accuracy, Trusted Results

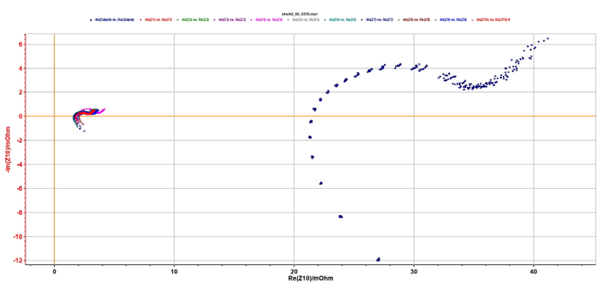
Insights in Action

For battery developers, high-quality data drives innovation. BioLogic solutions deliver more than precision — they enable advanced techniques such as high-frequency EIS for state-of-health insights, differential capacity analysis for degradation studies, fast transient measurements for safety evaluations, and multi-cell synchronization for robust performance comparisons. These capabilities help researchers better understand, optimize, and extend battery performance across all stages of development.

EIS measurements for packs & cells

Battery module and pack testing is critical for high-power energy storage applications. With BioLogic's Premium Potentiostats and our stack-measurement technology, researchers can simultaneously measure the impedance of the full pack and each individual cell. This ensures accurate insight into performance, safety, and degradation and enables faster and more efficient battery development.





EIS curve for stack & cells

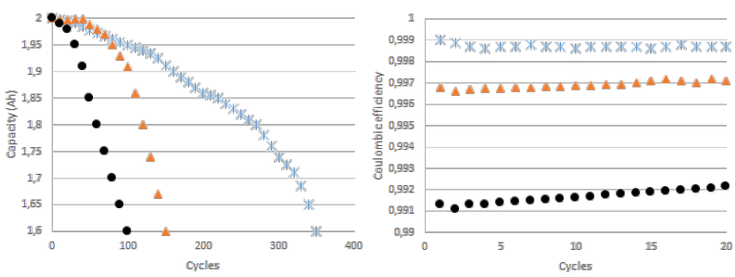






High-Precision Coulometry (HPC) for early degradation detection

In battery development, detecting degradation mechanisms early is critical for accelerating material screening. BioLogic's BCS-900 Series Battery Cyclers and Premium Potentiostats are high-resolution instruments that allow researchers to identify subtle parasitic reactions using High-Precision Coulometry (HPC). By determining the Coulombic Efficiency (CE) researchers can detect degradations much sooner than conventional cycling data.

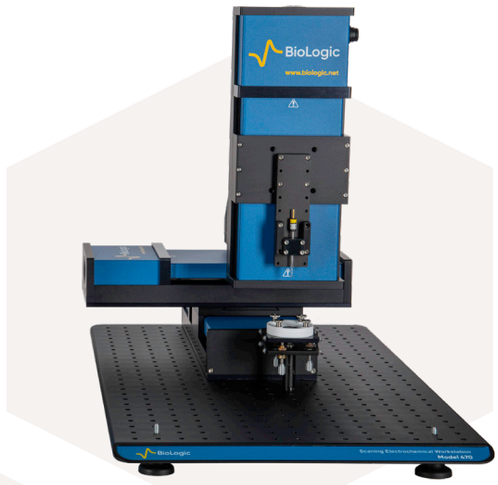


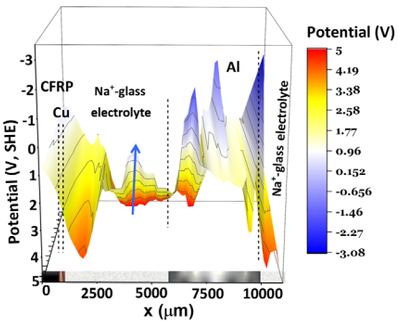
Long term cycling (left) vs HPC (right) plot

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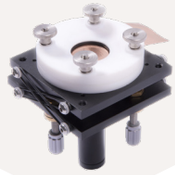
Scanning Kelvin Probe (SKP) for solid-state interface compatability

Using SKP it is possible to screen for electrolyte/electrode compatibility and further understand the charge transfer processes that occur at these interfaces. SKP exploits the formation of a parallel plate capacitor between the SKP microprobe and the sample, to measure the Contact Potential Difference (CPD) between them. With a well-defined probe the CPD is converted to values of interest, including the surface chemical potential. This is of interest for the study of solid-state batteries to understand the electrolyte/electrode system.





SKP plot showing coaxial cell surface. *Image courtesy of Prof. Helena Braga, University of Porto



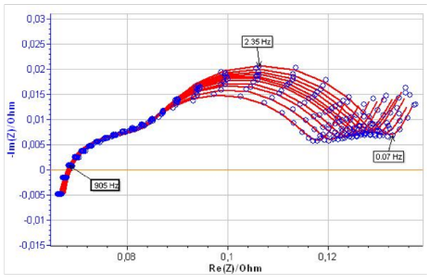
*B. Arouca Maia et. al., Compos. Part B Eng. 313 (2026) 113431



EIS ZFit for battery characterization

With EIS and the ZFit fitting tool in EC-Lab® and BT-Lab® Suite, battery developers can quickly turn complex impedance data into actionable insights. Users can track key parameters like internal resistance, SEI growth, charge transfer, and diffusion behavior automatically across cycles helping to identify early signs of degradation without destructive testing. This means researchers can optimize materials and cell designs faster and reduce the time and cost of development.





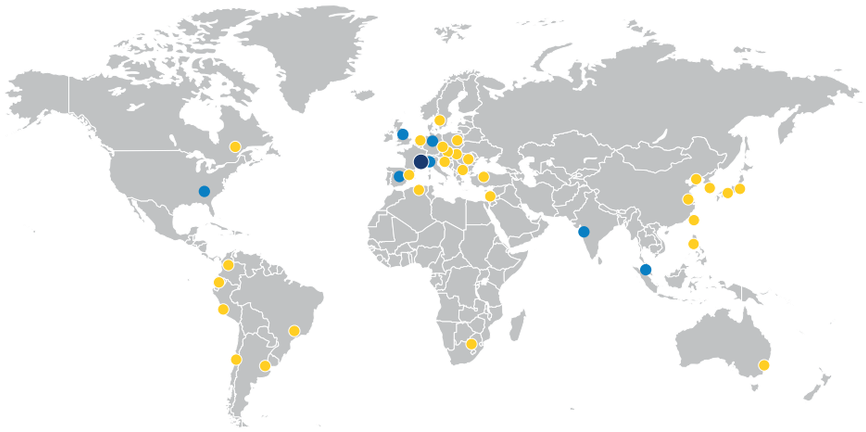
EIS Nyquist plot with ZFit

Embedded EIS up to 11 MHz

Our Premium EIS option delivers our highest frequency capability, allowing impedance measurements up to 11 MHz. This advanced option provides unparalleled frequency coverage, enabling complete characterization of your electrochemical systems with outstanding accuracy across the entire range.

The high-frequency capability allows you to investigate fast interfacial processes that are crucial for battery research and advanced materials characterization. Going up to 11 MHz enables you to expand your ability to resolve ultra fast processes at interfaces and in solid electrolytes.

We serve our customers worldwide through our subsidiaries offices and our extensive distribution network.



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Always by your side. Wherever you are.

We here at BioLogic pride ourselves on the quality and robustness of our instruments. However if you, for whatever reason, encounter a problem with your instrument, our global support network will help find you a solution quickly and effectively.

If you need more information, or perhaps a little inspiration, you can browse our ever-growing support database with hundreds of Learning Center articles, application/technical notes and support videos at www.biologic.net.

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Shaping the future. Together.