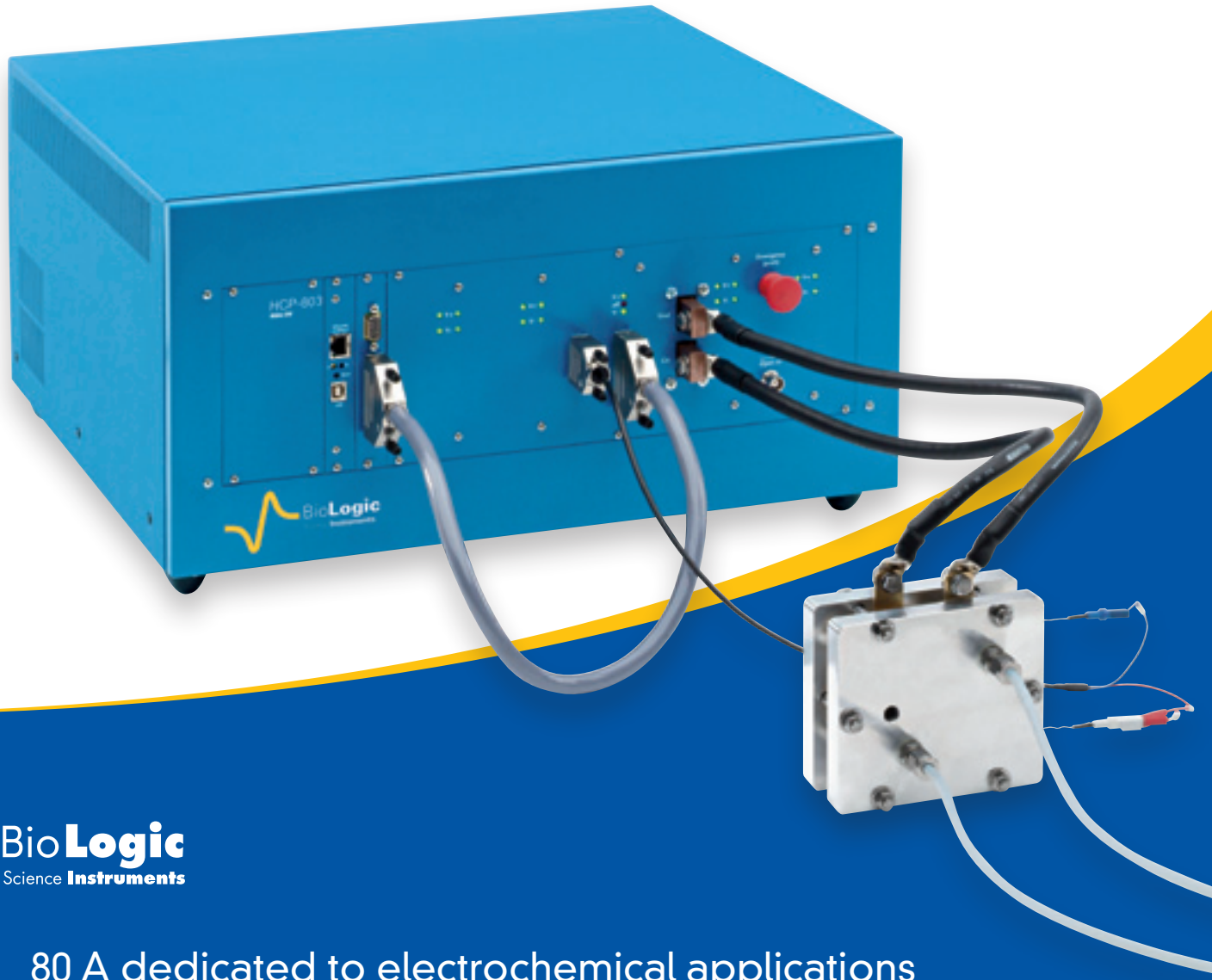
HCP-803

HIGH CURRENT POTENTIOSTAT/GALVANOSTAT



BioLogic
Science Instruments

80 A dedicated to electrochemical applications requiring current

- FUEL CELLS
- SUPERCAPACITORS
- ELECTROPLATING
- ELECTROLYSIS

With investment in new energy sources increasing, researchers need high current test stations. The **HCP-803** addresses many of the electrochemistry applications requiring high currents. The **HCP-803** is perfect for performing fuel cell aging tests (single cell or small stacks), for the characterization of supercapacitors and for electro-plating experiments.

This instrument is a research-grade potentiostat with an 80 A current booster option. It is available in two different models: as a stand-alone **HCP-803** and as an external booster **VMP3B-80** that works with a separate potentiostat from our family of units. The booster is compatible with the **SP-150**, **BiStat**, **VSP** and **VMP3**.

The external current booster is plug-and-play. It can be connected and disconnected from the channel board and reconnected to another one without switching off the instrument.

You can connect the **HCP-803** directly to the PC with a USB port 2.0. Or alternately, the Ethernet communication mode allows it to be installed on a Local Area Network. Analog inputs/outputs are available to interface to external instruments and record the generated data.

The **EC-Lab®** software is supplied with the unit and offers more than 50 techniques that can be sequenced or linked. There is also a number of analysis tools to examine the data.

EIS capability is provided as standard in the **HCP-803**. There are dedicated techniques to control the cell in potentio or galvano EIS mode. Among the different software analyses available, impedance modelling with Levenberg-Marquardt and Simplex algorithms are available.

GENERAL SPECIFICATIONS

- High current system: ±80 A
- Voltage range: ±3 V @ ±80 A
  and ±4 V @ ±40 A
- EIS capability from 10 µHz to 10 kHz and up to 1 MHz without booster
- EC-Lab® and EC-Lab® Express software
- Disconnectable current booster to use the system as a research grade potentiostat/galvanostat
- Available as a 80 A/3 V booster, compatible with SP-150, VSP and VMP3

EC-LAB® EXPRESS: EASY-TO-USE AND POWERFUL MONITORING SOFTWARE

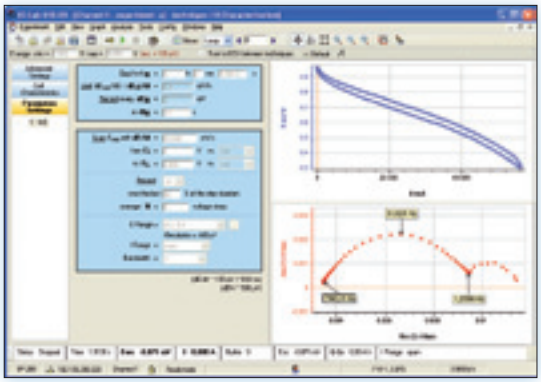
EC-Lab® Express software offers a full range of electrochemical techniques (more than 30 linkable techniques containing up to 100 sequences).

This software is very easy to use. The settings and graphs are shown on one screen view. An experiment selector enables the user to quickly switch between techniques. The user can set data sampling rates and recording conditions without any limit on the number of data points taken.

EC-LAB® A COMPLETE SOFTWARE FOR FULL CONTROL OF THE EXPERIMENT

Especially devoted to energy devices testing, EC-Lab® software offers more than 50 techniques with up to 100 sequences that can be linked.

Many experimental parameters can be modified "on the fly" during the experiment, with the change stored into the raw data file. The appearance of the software interface can be adapted to create the best working environment for the user. The powerful "Technique Builder" can be used to execute a series of different modular techniques and loop options to create complex experimental sequences.



In case of fuel cell testing, the monitored current can be used to control gas flow meters thanks to the external device configuration window.

ANALYSIS TOOLS

The complete graphic package provided with **EC-Lab®** software includes analysis tools and advanced fitting tools.

A "process data" function helps the user to calculate additional variables such as energy, charge or capacity during successive cycles.

EC-Lab® software offers classical analysis tools (such as linear or circular fit) and also a powerful tool for EIS data fitting. It includes electrical equivalent circuits with basic electronic elements and uses two minimization algorithms (Simplex, Levenberg-Marquardt).

TECHNIQUES

Voltammetric techniques:
OCV, CV, CVA, CA, CP, SV

Impedance Spectroscopy:
Galvano/potentio EIS, staircase EIS (Mott-Schottky), multisine mode

Technique builder:
Modular potentio/galvano, loop, trigger in/out, wait

Batteries and Supercapacitors:
Galvano/potentio cycling, constant load/power discharge, profile simulation

Photovoltaic/Fuel cells:
I-V Characterisation, constant load, constant power

Ohmic Drop:
Manual IR, EIS determination

Stack techniques:
I-V characterization, potentio/galvano EIS, constant current, constant voltage

SPECIFICATIONS

CHANNEL BOARD

Cell control

Connection	2, 3, 4 or 5 terminal leads (+ ground)
Compliance	10 V range adjustable from ±10 V to 0 – 20 V
Maximum current	±400 mA continuous
Maximum potential resolution	300 µV on 20 V dynamic range programmable down to 5 µV on 200 mV range
Maximum current resolution	0.004 % of the dynamic range programmable down to 760 pA on the 10 µA range
Accuracy (DC)	< 0.1 % FSR*
Rise time	< 2 µs (no load)
Acquisition time	20 µs

Current measurement

Ranges	±10 µA to ±400 mA (7 ranges)
Maximum resolution	0.004 % FSR*
Acquisition speed	200,000 samples/s
Accuracy (DC)	< 0.1 % FSR*

Potential measurement

Ranges	±2.5 V, ±5 V, ±10 V , ±10 V adjustable
Maximum resolution	0.0015 % of the range, down to 75 µV
Acquisition speed	200,000 samples/s
Accuracy (DC)	< 0.1 % FSR*

Electrometer

Inputs	3 potential measurements
Impedance	> 10^{12} ohms in parallel with < 20 pF
Bias current	< 5 pA

Auxiliary inputs/outputs

2 analog inputs	automatic ±2.5 V, ±5 V, ±10 V ranges
1 analog output	±10 V
1 input trigger	TTL level
1 output trigger	TTL level

General

Dimensions, weight	260 x 495 x 465 (mm, H x W x D), 23 kg
Power	85-264 V, 47-440 Hz

IMPEDANCE (EIS)

Impedance

Frequency range	10 µHz to 10 kHz (see contour map)
Amplitude	1 mVpp to 1 Vpp 0.1 % to 50 % of the current range
Accuracy	2 %, 2°

BOOSTER BOARD

Cell control

Connection	5 terminal leads
Compliance	-5; +5 V range (see contour map)
Maximum current	80 A continuous (see contour map)
Potential ranges	±5 V @ 1 A, ±4 V @ 40 A and ±3 V @ 80 A
Rise time Potentio	95 µs (10 mΩ load)
Galvano	150 µs

Measurement

Potential accuracy (DC)	< 0.1% FSR*
Current accuracy (DC)	< 0.5 % FSR*
Current noise (bandwidth 0-100 kHz)	14 mArms
Potential noise (bandwidth 0-100 kHz)	0.18 mVrms

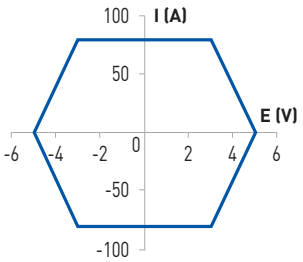
Electrometer

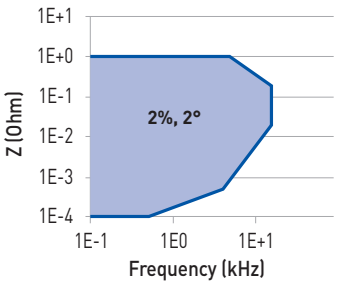
Inputs	3 potential leads for 2 differential measurements
Impedance	10^{10} Ohms

Auxiliary inputs/outputs

1 security input to open circuit
1 emergency stop push button

CONTOUR MAP





* FSR: Full Scale Range

Specifications subject to change

Bio-Logic, SAS
1, rue de l'Europe
38640 CLAIX - France
Tel.: +33 476 98 68 31
Fax: +33 476 98 69 09
www.bio-logic.info

Bio-Logic USA, LLC
P.O.Box 30009
Knoxville TN 37930 - USA
Tel: +1 865 769 3800
Fax: +1 865 769 3801
www.bio-logic.us

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