

BaSyTec EIS

Enhanced Impedance Spectroscopy

Enhanced Impedance Spectroscopy (EIS) is the method of choice for

- battery model parameter finding
- electrochemical reaction examination
- state of charge determination
- state of health determination

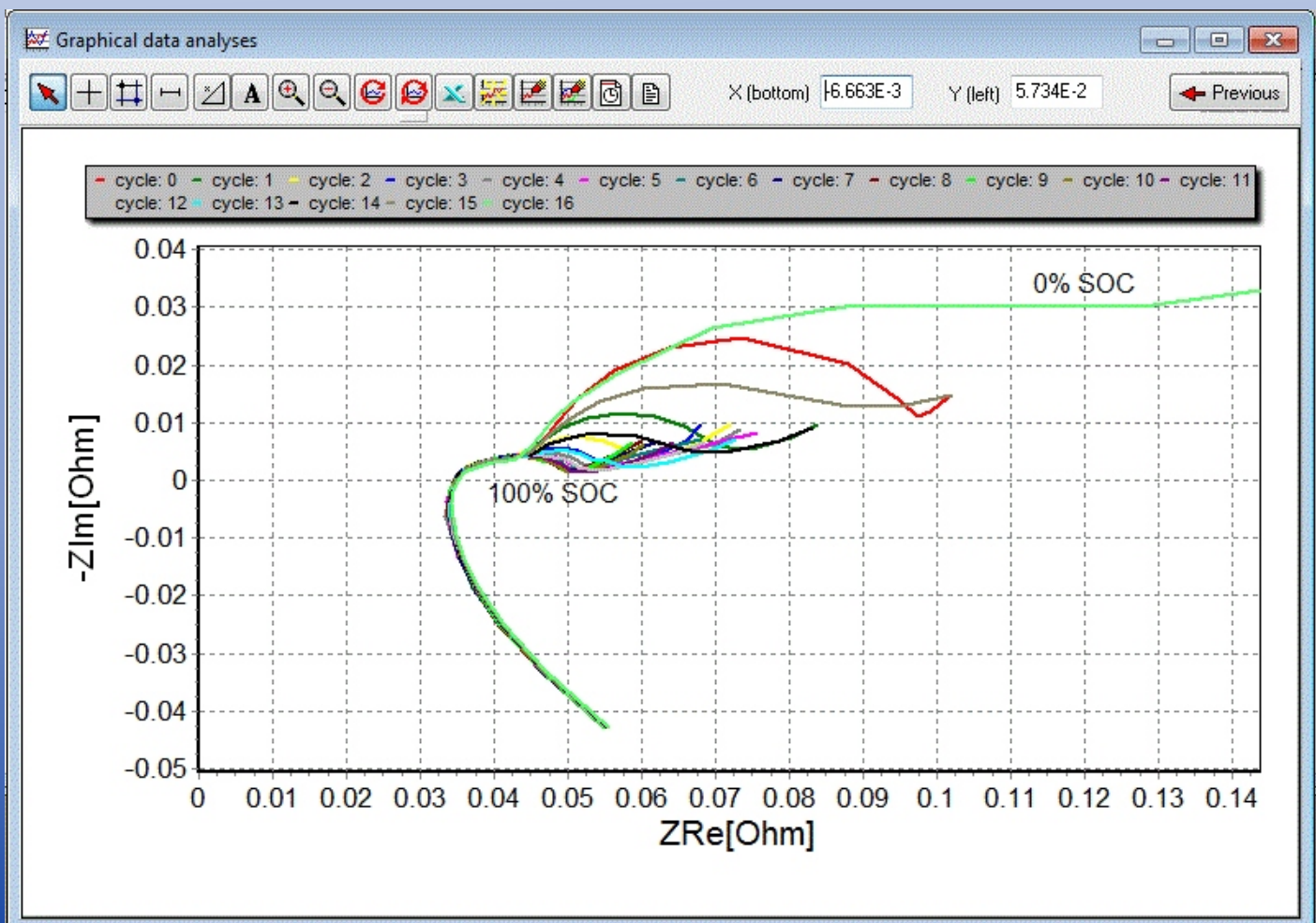
Up to 1000V
Up to 2400A
Up to 100kHz

Most BaSyTec Battery Test Systems can be combined with a Gamry spectrometer in order to measure the complex impedance of a battery.

It's operation is completely **integrated** within the BaSyTest Battery Test Software.

An optional multiplexer can be used to share the spectrometer with up to 64 test channels.

To **fit** the measured data to an **equivalent circuit** the Echem Analyst software is included.



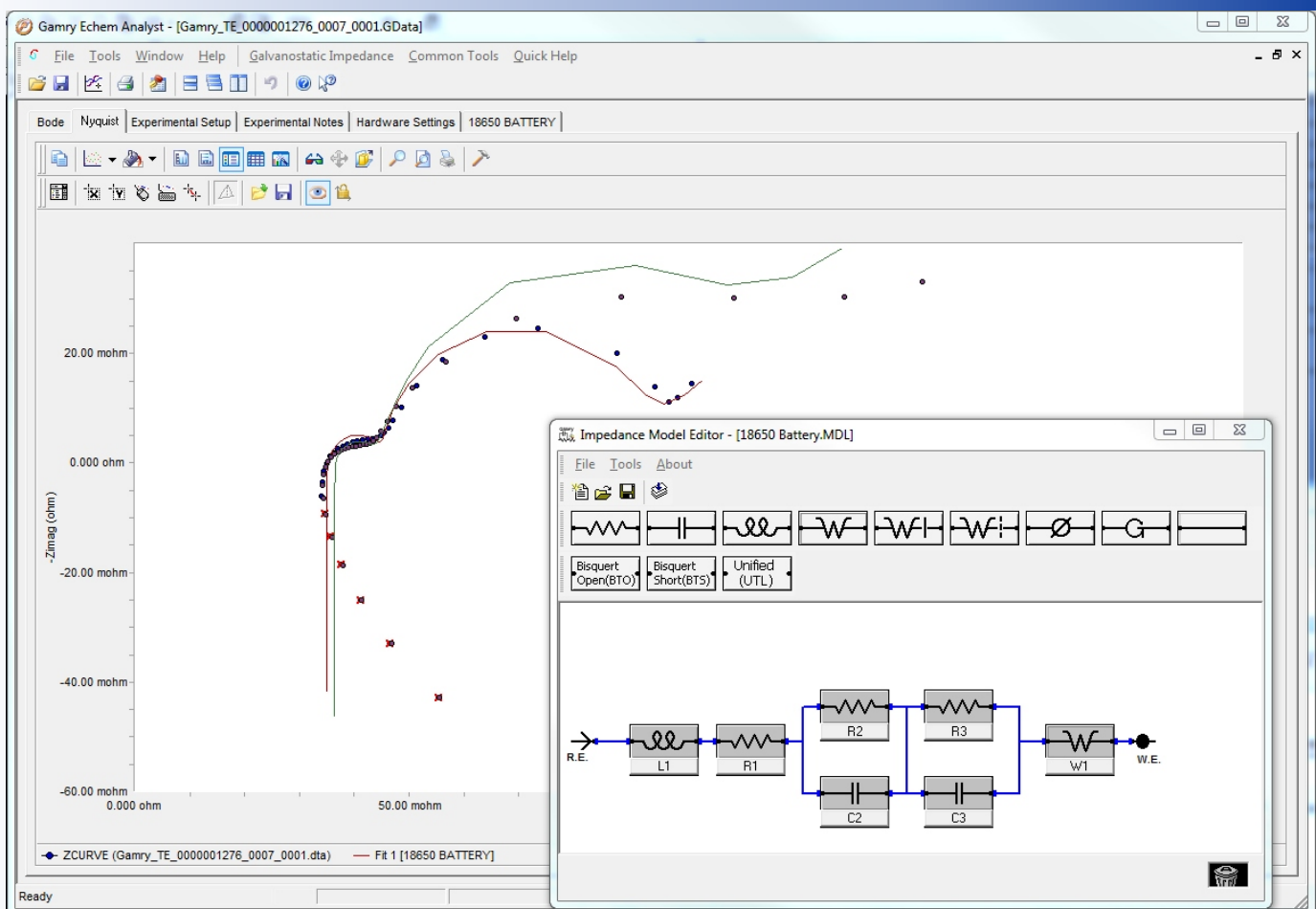
EIS of a 18650 battery at different SOC (BaSyTest Software)

BaSyTec EIS

Enhanced Impedance Spectroscopy

Technical Data

Type Gamry	FC350		Interface 1000	Interface 5000	Reference 3000
Type BaSyTec	HPS	RPS	All with suitable voltage range		
Max. Voltage	70V	1000V	12V	8V	15V
Max. DC Current	2400A		As BaSyTec Battery Test System		
Max. AC Current	60A		1A	5A	3A
Current Ranges	As BaSyTec		11 (100pA-1A)	8 (500nA-5A)	13 (3pA-3A)
Min. Frequency			10 μ Hz		
Current Generation	AC+DC by BaSyTec		AC by Gamry, DC by Gamry or BaSyTec		
Max. Frequency	100kHz	1kHz	1 MHz (for batteries more than 100kHz makes no sense)		
AC Precision	+/-0.5%+0.5%/kHz +/-0.5°+0.5°/kHz @10m	+/-2%+2%/kHz +/-2°+2°/kHz @100m	See accuracy Contour Plot (with mux worse by a factor of 2)		
Recommended for	Large Cells and Modules	Large Modules and Batteries	Small Cells (R, 30m and up)	Cells	Cells and Small Packs
Voltage Inputs	1	1	1	1	8 cells+module
Potentiostatic Mode	Pseudopotentiostatic (AC only)		Yes, AC + DC		
Galvanostatic Mode	Yes, AC+DC				
Multiplexer	Up to 16 Test Channels		Up to 64 Test Channels		



Echem Analyst for equivalent circuit drawing and parameter fitting

BaSyTec GmbH

Oellinger Weg 17, 89176 Asselfingen, Germany

Tel.: +49-7345/238 500, Fax: +49-7345/238 725, www.basytec.com Status: 4/2015