GLOBAL ENERGY INNOVATIONS

Handheld ElectroChemical Battery Analyzer

Technical Data Sheet

This technical data sheet states the performance specifications and operating conditions for the EC1000™ and EC2000™ ElectroChemical Battery Analyzer. The EC1000™ and EC2000™ are advanced battery test instruments used for accurately measuring chemical and electrical battery health in terms of Sulfation, Dryout, Voltage and Impedance. All four parameters are measured simultaneously in a single measurement using CELScan™ Technology. For further information about the benefits, applications, operation, equipment configuration and service products of the EC1000™ and EC2000™, please refer to the User's Manual, Application Notes and Ordering Guide.

You can find all of the latest product material on the Global Energy Innovations' website.

Performance Specifications and Operating Conditions

Test Method	CELScan™ Frequency Response Analysis. Completely non-intrusive.
Data Trending	Available but not required for measurement and detection of battery health degradation. (Battery health is determined from a single measurement).
Amp-Hour Capacity Range for Batteries Under Test	5 Ah to 2,000 Ah, Specified Performance Range 1 Ah to 9,999 Ah Operating Range Amp-hour measurement capabilities depend upon whether or not the battery impedance is within the measurement range of the device. Typically, the larger a battery's Ah capacity, the lower its impedance.
Measures Battery on Float	Yes – (battery must be fully charged and at equilibrium)
Measures Batteries at Open-Circuit	Yes – (battery must be fully charged and at equilibrium)
Impedance	
Measurement Range	50 µΩ to 1 Ω
Resolution	0.001 mOhms for all measurable impedance values
Accuracy	± 1.0 % (for Impedance > 1 mΩ to 1Ω) ± 1.0 % (for Impedance > 100 µΩ to 1 mΩ)
Accuracy Traceability	Through NIST traceable standards
Repeatability	± 1.0 % (for Impedance from 100 µΩ to 1 Ω)
Voltage	
Range	0 to 17 VDC
Resolution (Display)	10 mV
Accuracy	± 0.5 %
Accuracy Traceability	Through NIST traceable standards
Repeatability	± 0.5 %

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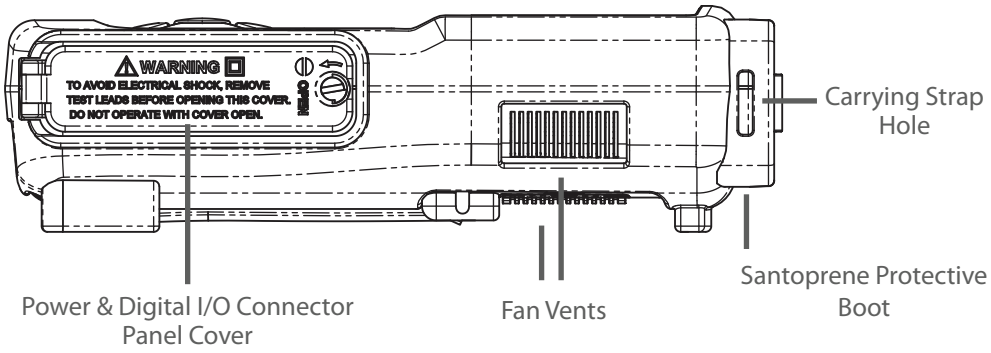
Sulfation **Battery Charge Capacity Loss** **(specified for Impedance range: 100 µΩ to 1Ω)**	
Range	0 to 100% (relative to the amount of battery charge capacity degradation due to Sulfation)
Accuracy	± 2.5 %
Accuracy Traceability	Test methodology traceable to NIST standards
Repeatability	± 1.0 %
Dryout **Battery Charge Capacity Loss** **(specified for Impedance range: 100 µΩ to 1Ω)**	
Range	0 to 100% (relative to the amount of battery charge capacity degradation due to Dryout)
Accuracy	± 2.5 %
Accuracy Traceability	Test methodology traceable to NIST standards
Repeatability	± 1.0 %
Cell Terminal Strap Impedance (mOhms)	
Measurement Range	50 µΩ to 1 Ω
Resolution	0.001 mOhms for all measurable impedance values
Accuracy	± 1.0 %
Accuracy Traceability	Through NIST traceable standards
Repeatability	± 1.0 % (for Impedance from 100 µΩ to 1 Ω)
Measurement **Pass/Warning/Fail Indicators**	Yes (visual and audio)
Specific Gravity	Manual Logging
Calibration	
Automatic System Calibration upon Startup (System Boot)	Yes - Standard
Annual Instrument Calibration	Auto calibration routines build-in. Annual Calibration (Certificate) may be performed if required.
Automated Baselining Baseline Adjustement Utility	Automated baseline generation and adjustment utility for rapidly determining your baseline Impedance, Sulation and Dryout baseline values for new and old batteries or battery strings.
Upgradeable	Yes (Oscilloscope - Line Noise Detect, Voltmeter, Others as available)

Display	
Type	Color - TFT LCD
Display Viewing Area	3.50 in (8.9 cm) Diagonal 70.08 (W) x 52.56 (H) mm
Display Format & Color Depth	320 (W) x 3 [R.G.B.] x 240 (H), 16M Colors
Backlight	LED Backlight / White LED
Memory	
Type	Read/Write Flash RAM (Mini SD)
Supported Size	16 GB
String/Cell Data Storage Capacity	Depends on SD Card Size and String Configuration
Communications	USB, Ethernet, Mini SD Card
Internal Battery	
Type	Lithium-Ion (Standard and High-Capacity Options)
Voltage	12 VDC
Capacity	Standard - 5.4 Ah, High-Capacity - 8.0 Ah
Typical Instrument Battery Run Time	Standard - 6 to 10 hrs , High-Capacity - 8 to 12 hrs (depending on use)
Charge Time	3.0 to 4.5 hrs (more for High-Capacity)
AC Adapter Charger	
Input Voltage	90-264 VAC
Output Voltage	15 VDC
Output Current	1.67 Amps
Frequency	47-63 Hz
DC Vehicle Adapter Charger	
Input Voltage	12.0 VDC
Input Current	8 Amp max
Output Voltage	115 VAC
Output Frequency	60 Hz
Output Power	60 Watts Continuous (75 Watts – 5 Min.)
Environment Conditions	
Operating Temp Range	0° to 45° C
Storage	-20° to 60° C
RH Non-Condensing	90%
Key Pad	Silicone Rubber
Upload New Software from Internet or CD	Yes – Using IBMS™ (Intelligent Battery Management System™) Interface and Reporting Software
Data Collection and Reporting Software	Yes – Using IBMS™ (Intelligent Battery Management System™) Interface and Reporting Software

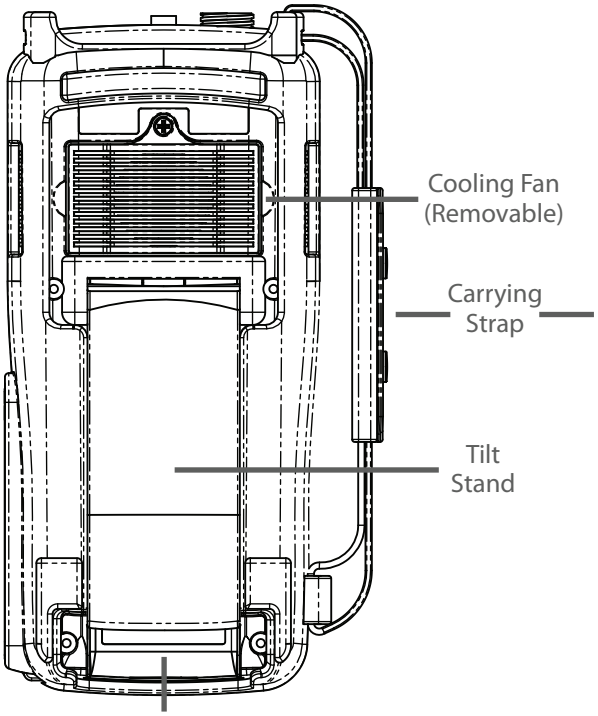
User Programmable Functions	
Number of preset battery/string configurations that can be stored	Depends on SD Card Size and String Configuration
Voltage Alarms	Yes
Impedance Alarms	Yes
Sulfation Capable (Capacity Loss Reading)	Yes
Dryout Capable (Capacity Loss Reading)	Yes
Manual Push Button Test Mode and Hands-Free, Auto-Start Test Mode	Yes
Safety Features	
Over-Voltage Auto-Reset Breaker (High-Voltage Protection)	Overvoltage Warning: 17 VDC Danger Warning: 50 VDC Damage Point (Protection Failure): 600 VDC max.
Reverse Polarity Protected	Yes
Weight	2.8 lb (1.27 kg)
Dimensions	4.25 x 10.05 x 2.30 in (108 x 267 x 58 mm)
Warranty	1-Year Limited Warranty
Cable Connector Assemblies	
Standard Kelvin Clips	Yes (with removable jaws)
Double-Point Kelvin Probes	Yes (with removable tips)
Single-Point Kelvin Probes	Yes (with removable tip)
Optional Accessories	
SD Card Reader	For use with PC
DC Vehicle Adapter Charger	For use with AC Adapter Charger
Preminum Hard Carrying Case	Heavy-duty case for protection of handheld device
Accessory Cable Set	For use with Oscilloscope, Voltmeter, Other
Service Support	
Instrument Training	Yes
Customer Support Website	Yes
Technical Support Hotline	Yes
Warranty Extension Available (1 and 2 Year)	Yes
Instrument Calibration Program	Yes

EC1000™ & EC2000™ PRODUCT IMAGES (PART I)

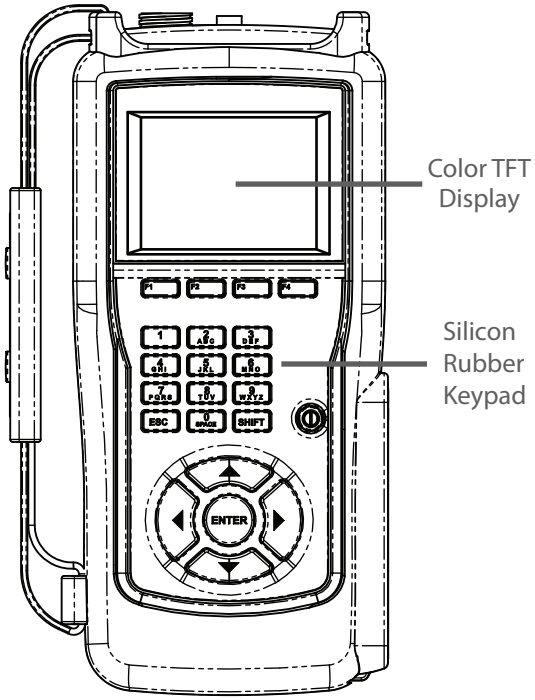
SIDE VIEW



BACK VIEW

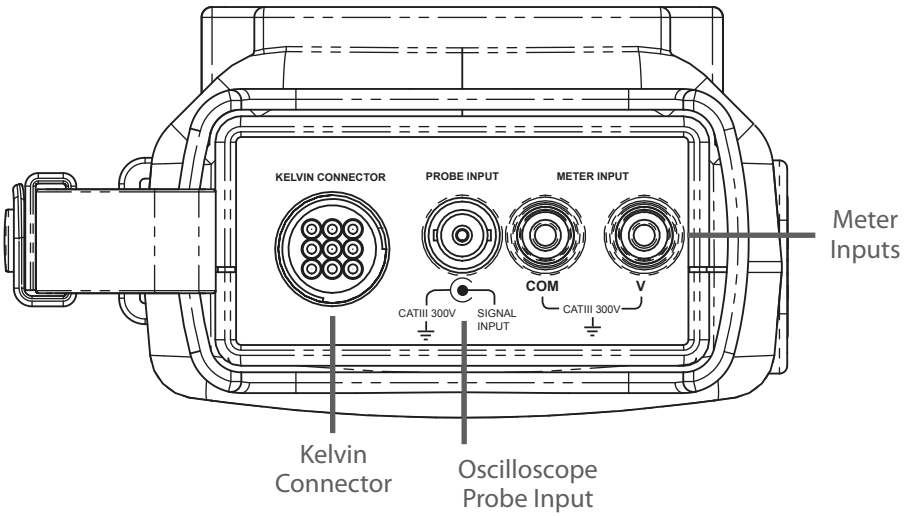


FRONT VIEW

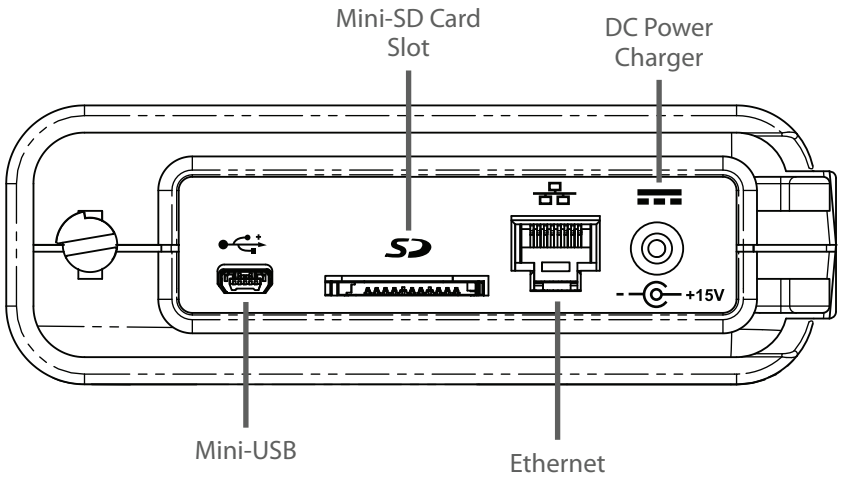


EC1000™ & EC2000™ PRODUCT IMAGES (PART II)

TOP VIEW



POWER & DIGITAL I/O CONNECTOR PANEL



www.Instrumentation.com
8800 West Chester Pike, Upper Darby, PA 19082
T 610-446-6600 Fax 610-449-7010