

Rapid Battery Scanner (BattScan) Product Specification Sheet

Last updated: Dec 2024

Test batteries in minutes, not hours

The BattScan is able to estimate battery capacity within 98% estimation accuracy in a 10 minute test. These results were benchmarked against a 6 hour cycling test.

A sample of 100 batteries could be capacity tested in 1 week with just one device for SOH and quality assurance testing. See our [case study](#) with used e-truck battery modules.

Perform advanced battery diagnostics on battery cells, modules and high voltage battery packs like never before. Rejoule's Battery Scanner (BattScan) is our patented technology that enables advanced battery diagnostics using electrochemical impedance spectroscopy (EIS) on high voltage battery systems and subsystems. BattScan can help automotive OEMs, battery manufacturers, and battery re-manufacturers save time and money on battery grading.

The BattScan performs a standard EIS test across three decades of frequency ranging from 0.1Hz to 1kHz, to enable rapid insights into materials degradation such as SEI layer growth, increased charge transfer resistance, and increased diffusion resistance. Understanding how these degradation mechanisms change over time enables a more accurate assessment of capacity and power fade of battery modules and packs. There are 4 types of BattScan depending on the voltage ranges:

- BattScan005C: 2-20V (cell level)
- BattScan050M: 10-50V (module level)
- BattScan450P: 200-450V (pack level)
- BattScan500V: 200-500V (in-vehicle level)

Benefits of BattScan

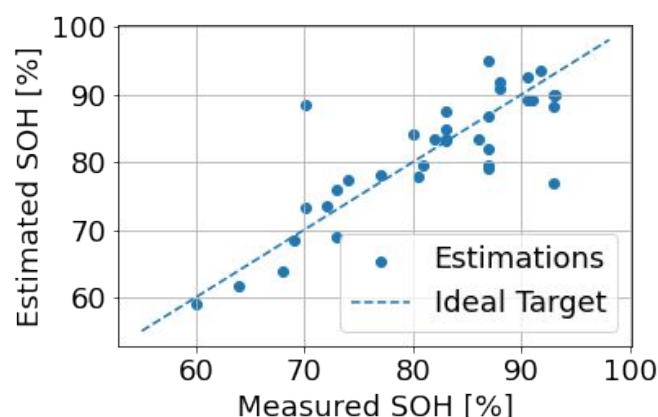
- Fast, non-invasive, and reliable diagnostic to grade battery cells, modules and packs.
- For battery repurposing, speed up test time from 6 hours to < 10 minutes
- Easily embed into your battery testing process with a portable design
- Modern cloud-based software toolset BatteryDB to keep track of tests, batteries, and devices.

How to get started

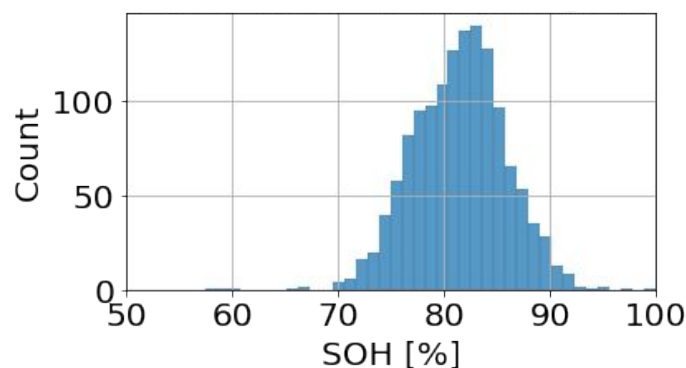
Contact us and tell us about your needs. We'll work with you to build a custom test program that involves:

- Acquiring sample batteries for initial characterization (~30-50 samples typical)
- Characterization testing (cycling + EIS)
- Data analysis, model development, and test reports available after initial period
- Capacity estimation EIS-based (on cloud)

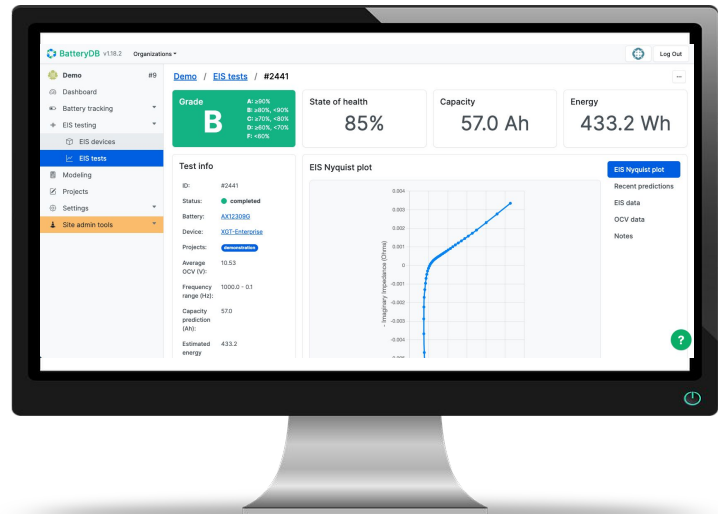
Applications: Residual value, Preventive maintenance, Remanufacturing, Service, Second-life Repurposing, and more.



Sample SOH measured by cycling compared to the SOH estimation done with the EIS-based ML model.



Histogram of the estimated SOH of 1670 Valence 12.8 V EV battery modules. Most EIS data used for the SOH estimation was gathered in 3 months.



Rendering of BattScan-050M hardware (above)
and BatteryDB software (right)

Hardware Specifications

Note: Specs can be customized for other desired battery voltage ranges

BATTSCAN050M - Link to demo		Available today!
# channels per unit	1 channel per tester	
EIS testing per channel	10A EIS, up to 50V, 0.08Hz to 1kHz	
# cells in series per module	Up to 16S cells	
Voltage range per channel	5V to 50V	
Input power	120 or 240 VAC, 1ph, 500W max	
Data interface	Ethernet / Wifi	
Physical Dimensions WxDxH	471 mm x 483 mm x 133 mm	
Product weight	24 lbs (10.9 kg)	
Operating temperature range (storage)	0 – 42°C (32-107.6°F)	

BATTSCAN450P		Prototype available
# channels per unit	1 channel per tester	
EIS testing per channel	10A EIS, up to 450V, 0.08Hz to 1kHz	
DCIR testing per channel	+10A pulse, higher current options avail. upon request	
Voltage range per channel	95 V to 450V	
Input power	200-240 VAC +/-10%, 47-63 Hz	
BMS data input	CAN to USB	
Data interface	Ethernet / Wifi	
Physical Dimensions WxDxH	762 mm x 533 mm x 823 mm	
Product weight	170 lbs (77 kg)	
Operating temperature range (storage)	0 – 42°C (32-107.6°F)	

BATTSCAN500V	Prototype available
# channels per unit	1 channel per tester
EIS testing per channel	Up to 10A EIS, up to 500V, 0.08Hz to 1kHz
DCIR testing per channel	+10A pulse, higher current options avail. upon request
Voltage range per channel	95 to 500 VDC
Input power	200-240 VAC +/-10%, 47-63 Hz
Data interface	Ethernet / Wifi
Physical Dimensions WxDxH	762 mm x 533 mm x 823 mm
Product weight	175 lbs (79.4kg)
Operating temperature range (storage)	0 – 42°C (32-107.6°F)
Vehicle Interface (select one interface at time of purchase)	CCS Combo 1 and 2 NACS compatible (adapter available upon request) CHAdeMO

BattScan500V is the world's first device that can measure an electric vehicle's battery health through the DC fast Charging Port. This overcomes the need to remove the battery from the vehicle and cycle test it. Simple enough to be operated by anyone with the skills to change the oil on a conventional car, BattScan500V can optimize EV Pre-sale Inspection, EV maintenance, and EV re-sale.

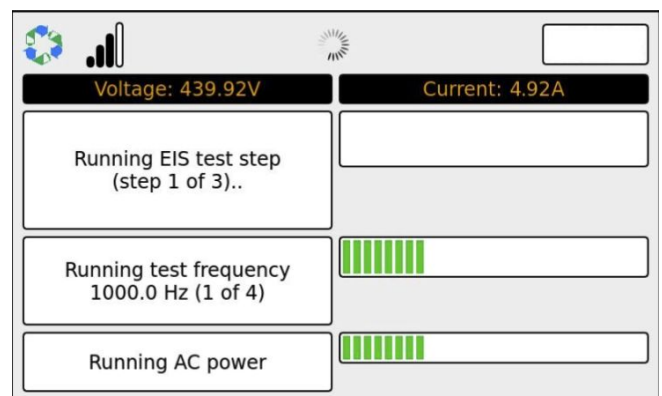
BattScan500V offers:

- Unbiased, accurate battery capacity information to assess a vehicle's residual value.
- The means to recalibrate the onboard BMS for improved accuracy and streamline repairs.
- A powerful tool for workers who may lack training on high-voltage batteries.

BattScan500V's LCD screen displays simple instructions for starting and concluding the test.



Rendering of BattScan500V hardware



Rendering of LCD screen on BattScan500V

BatteryDB Cloud-based Data Platform Features

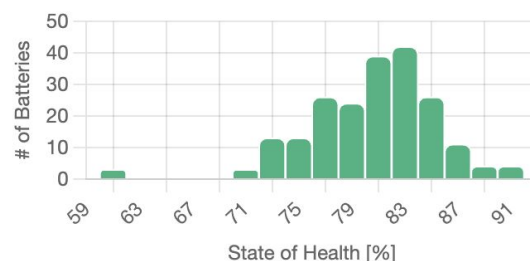
Control devices, see immediate test results, access historical data, manage your battery inventory or provide a health report after testing; all in one cloud-based data platform designed specifically for used battery testing.

Features

- Instant test results viewable as a plot or table, exportable as a CSV
- See all historical test results, also by device or battery
- Capacity Estimations: View estimations made by the model for any test*
- Estimated Energy: View Estimated Energy for a battery based on test results and nominal capacity*
- Project Tagging: Categorize batteries, devices, and tests by project with aggregate information and plots available by project
- Operator tracking: associate test runs with the user that performed them
- Markdown Notes: Record Markdown-formatted notes about resources or test
- Auto-Timestamp Changes: Auto-record timestamps of changes to BatteryDB resources
- Support multiple predictive SOH models per organization for testing different battery types
- Role Based Access: User can be granted different levels of access within the organization based on their role
- Multitenancy: All data is linked and limited by organization ensuring full privacy and security for user data

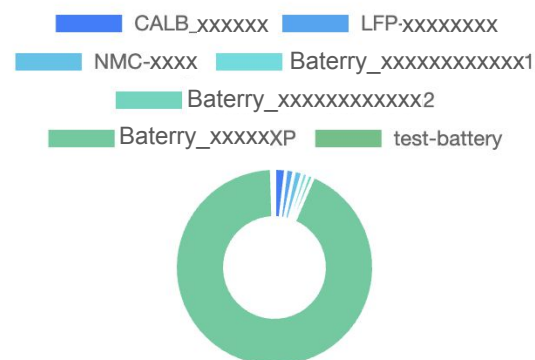
*Available after characterization phase only

Estimated SOH of 208 batteries

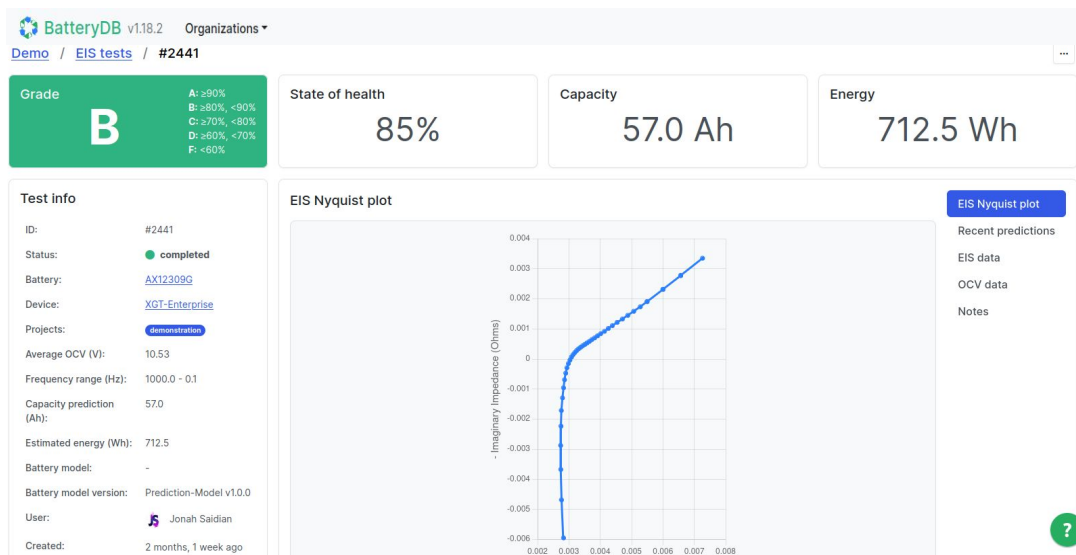


Example of completed tests histogram by SOH% in BatteryDB dashboard

Batteries (217 total, 7 types)



Example of Battery distribution of total tests completed in BatteryDB dashboard



Screenshot of BatteryDB test result page