



Battery Testing & Analysis Services

**SUPPORTING AUSTRALIAN INDUSTRY
WITH PRECISION BATTERY TESTING
SERVICES**

Mi[®]
BATTERY ENGINEERING



Battery testing is a critical process that ensures the reliability, safety, and performance of batteries used in various applications, from consumer electronics to electric vehicles, and now energy storage solutions as this sector continues to expand.

Proper testing identifies potential issues such as capacity degradation, thermal runaway, and service life, helping manufacturers optimise designs and maintain quality standards. Furthermore, testing can assist with assessment of products under differing environmental conditions, under varied or specific usage parameters, obsolescence planning, or to assist in fault diagnosis.

In an era where energy efficiency and sustainability are increasingly prioritised, effective battery testing plays a vital role in advancing technology and fostering consumer trust.

Master Instruments has invested heavily into the latest precision testing equipment, from world renowned specialists such as Arbin & Cadex, at our dedicated testing labs in Sydney and Perth facilities. These are in addition to our West Mountain Radio and Vencon machines, providing depth & scale to our testing services with a wider array of functions and capabilities.

At Master Instruments, our engineers utilise a number of different test procedures to ascertain battery performance & suitability for different applications, failure analysis and obsolescence planning, plus isolating short comings to allow us to provide our customers with the best options for their price, performance and total cost of ownership parameters.

Our engineering team is on hand to discuss how our testing services can assist with your product development, assessment & evaluation or performance evaluation.

Some of the tests we can conduct for our clients:

Battery / Cell Life Cycle Testing

Purpose: Provide estimates to ascertain when product usable life will cease.

Benefit: Research to predict the degradation and lifespan of battery packs under different conditions.

Internal Resistance Testing

Purpose: Tests internal resistance to assist battery end-of-life.

Benefit: Used in energy storage systems (ESS) for renewables to ensure optimal battery efficiency over long-term usage.

Real-World Simulations

Purpose: Simulates defined conditions to test battery performance.

Benefit: Simulate real conditions for devices to assess how the battery will perform in daily usage.

Capacity Testing

Purpose: Ascertains battery capacity at defined currents.

Benefit: Used in consumer electronics like smartphones or laptops to determine how long the device will run on a full charge.

Charge Pulse Test

Purpose: Assesses battery performance under pulse loads.

Benefit: Applied in power tools to simulate the high power demand from short, intense bursts of energy usage.

Charge / Discharge Profiles

Purpose: Simulates differing/ dynamic load profiles.

Benefit: Used in grid-level ESS to simulate dynamic energy demand patterns and ensure stable operation under varying loads.

Safety Testing (Overcharge/Overdischarge)

Purpose: Assess the behaviour of batteries under overcharging/ discharging conditions.

Benefit: Used in electric vehicle battery testing to ensure compliance with safety regulations.

Direct Current Internal Resistance (DCIR) Testing

Purpose: Measure the internal resistance under varying currents.

Benefit: Applied in grid-tied ESS to ensure batteries can handle peak loads and prevent efficiency losses.

Thermal Runaway Testing

Purpose: Tests how a battery responds to high temperatures leading to thermal runaway.

Benefit: Use to find most thermally stable battery for aerospace and defense applications..

Arbin Cell Tester: LBTS-Cell

64 Channel precision laboratory test system for analysing cells of various chemistries.

Voltage Range: 0V - 5V
Max Current: 5A (per channel)

- Industry leading 24 bit resolution through the 4 current per channel system
- Embedded controllers to provide ultra-fast data logging (up to 2000pts/sec, per system)
- Fully Parallelable so any number of channels can be connected to increase current handling capability
- Dynamic data acquisition based on changes in time, voltage, and current to capture more data when it's needed and maintain efficient file sizes.
- CAN interface with Arbin's Multi-Zone Temperature Chamber (MZTC) and EIS module.
- Comprehensive safety features for lithium-ion battery testing.



Arbin Battery Tester: LBTS-Module

24 Channel and 8 Channel precision laboratory test system for battery pack testing & analysis.

Voltage Range: 0 – 24V (24CH)
0 – 60V (8CH)
Max Current: 10A (24CH)
15A (8CH)

- Each channel provides three or four current ranges with industry-leading 0.02% accuracy.
- Powerful embedded controllers provide ultra-fast data logging (up to 2000pts/sec, per system).
- Easily simulate custom EV drive profiles or stationary grid storage profiles without complicated scripts.
- Fully parallelable so any number of channels can be connected to increase the current handling capability.
- Dynamic data acquisition based on changes in time, voltage, and current to capture more data when it's needed and maintain efficient file sizes.
- Full set of auxiliary options for cell monitoring, temperature monitoring, environmental chamber control, and more.



Cadex Battery Analyser: C8000/C7400

4 channel professional battery analyser for battery pack testing & analysis by a true industry leader in battery analysis products.

Voltage Range: 1.2V - 36V
Max Current: 6A (per channel)

- 14 onboard programs + 4 custom profiles available
- 3200+ battery specific adaptor plates + universal options
- Fully programmable operation through their Advanced BatteryShop software
- BatteryShop software capable of controlling up to 32 analysers.
- Perform complex battery analysis by setting unique test parameters through the PC. See and store real-time data, and customize voltage and current.
- Multiple output options to record, store and even print test results onto adhesive labels for better fleet management.



Cadex C7400



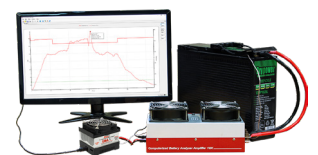
Cadex C8000

West Mountain Radio (WMR): WMR CBA V

Computerised battery discharge analyser capable of scientifically and accurately analysing any type of battery from coin cells to automotive batteries up to 100V.

Voltage Range: 1.0V - 100V
Max Current: 40A (no amplifier)

- True constant current battery capacity test with results graphically displayed, constant power testing supported with Extended software upgrade
- Discharge current is software and electronically regulated using a solid state switch and fan cooled electronic load
- Test any type of battery; coin cell to automotive or larger. Presets for NiCd, NiMH, Lead Acid, Lilon, LiPo, Alkaline, Carbon Zinc, Mercury etc.
- Solar cell profiling capability
- Lower current testing capabilities - down to 10mA
- Multiple discharge tests can use Watts as a parameter.



Amplifiers and other accessories help customise the CBA V for your requirements.



Visit www.master-instruments.com.au or scan the code for more information.

Why choose to incorporate battery testing?

Optimise performance.

Ensure reliability.

Validate results.

Accurate battery testing is critical to informed design decisions, compliance assurance, and long-term product success.

The advanced testing solutions offered by Master Instruments can be tailored to your specific application & usage characteristics, helping you characterise, benchmark, and validate battery performance with confidence.

Get in touch with our technical team to explore how precision battery testing can add measurable value to your development process.



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