

Battery Cycling and DC Testing System



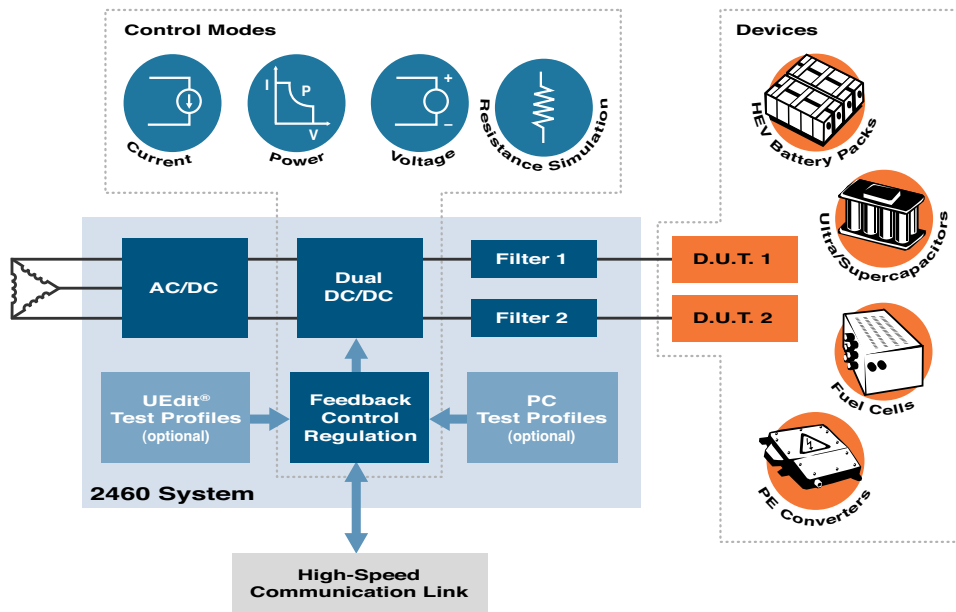
High-
performance
testing
solution



BATTERY CYCLING AND DC

A comprehensive testing solution that performs

UNICO For more than four decades, Unico has been providing innovative DC power solutions for industry. We pioneered the first high-power electronic DC servo drives back in 1967. From the earliest stages of automotive HEV development, Unico has supplied DC power solutions for battery simulation. With the 2460, we have engineered a system specifically for battery cycling and DC testing.



The Unico 2460 battery cycling and DC testing system combines the 2460 family of single- and dual-output DC power supplies with software specifically tailored for testing HEV battery packs, ultra- and supercapacitor packs, fuel cells, power electronic converters, and other devices.

Control Precision and Flexibility

The 2460 system is highly configurable and provides the flexibility and performance to accommodate even the most demanding testing applications.

Control Modes

The 2460 can precisely regulate key electrical parameters such as current, power, voltage, and simulated load resistance.

Seamless Mode Switching

On-the-fly toggling between control modes facilitates handling changing parameter constraints.

High-Frequency Update Rates

Typical update rates from 1 kHz (1.0 ms) to 10 kHz (0.1 ms) allow digital control loops to accurately track constant, ramping, or otherwise varying commanded target levels.

TESTING SYSTEM

User Programmable

Users are provided several options for programming test cycles and load profiles that suit their unique application requirements.

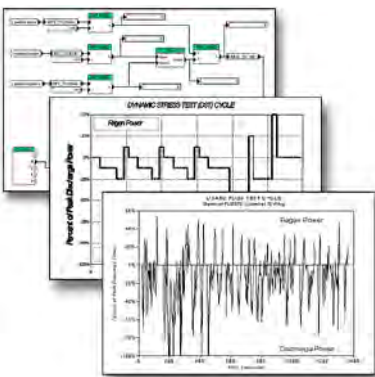
UEdit® Tools

The optional UEdit® tool suite provides embedded programming, data logging, and chart recording capabilities. Ladder and function-block editors define such test features as:

- Control mode selection (current, power, voltage, or resistance)
- Parameter levels
- Protection limits
- Ramp rates
- Delay and dwell times
- Cycle repeat counts

PC Controller

A fully featured PC controller option is available with the user programming capabilities of widely recognized software packages such as Simulink and LabView.



A variety of user-programmable and preprogrammed options are available for defining test cycles and load profiles.

Preprogrammed

Rather than program their own test profiles, users can instead select from and execute existing test programs previously developed by Unico. Data logging and test report generation can also be provided. Available test programs, which are part of the LabView test suite, include:

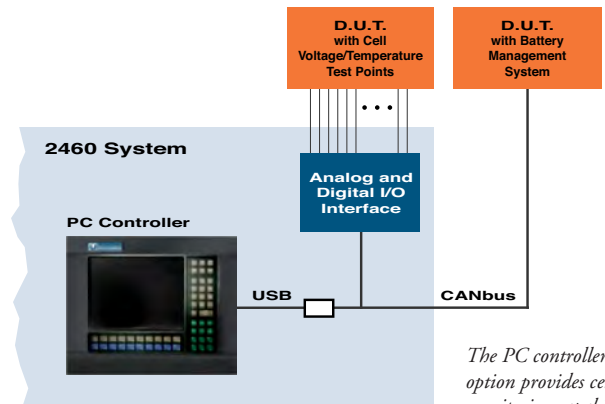
- Constant current discharge cycling
- Constant and peak power testing
- Variable-power testing
- Federal Urban Driving Schedule (FUDDS) and similar test regimes
- Dynamic stress test (DST)
- Partial discharge testing
- Hill climb testing
- Thermal performance testing
- Fast charge testing
- Life cycle testing

High-Speed Link

A high-speed communications interface is optionally available to accept commands from existing customer controllers that are used to generate test profiles. Wired and fiber-optic options are available.

Supported protocols include:

- CANbus
- LonWorks
- ControlNet
- Modbus Plus
- DeviceNet
- Modbus TCP
- EtherCat
- Profibus
- Ethernet I/P
- ProfiNet
- Interbus S
- USB



The PC controller option provides cell monitoring capabilities by interfacing with either a battery management system or individual cell test points.

Protection

The 2460 system incorporates features that protect test articles from over-stressing, including:

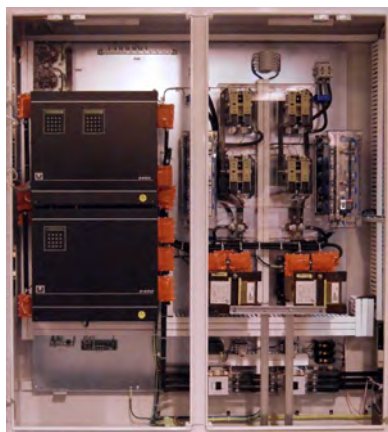
- Reverse voltage clamp
- Programmable current, voltage, and power overstress protection
- Voltage equalization circuit to limit inrush currents on power-up
- Output filters protect from potentially harmful ripple voltage and current
- Optional user-defined alarm thresholds including temperature and cell voltage monitoring

For testing of

- HEV battery packs
- Ultra- and supercapacitor packs
- Fuel cells
- Power electronic converters

Additional Options

- Battery simulation
- Series/parallel operation
- Line regeneration
- Common bus energy sharing
- Arc flash compliant data port
- Isolated outputs



A 2460 Battery and DC Testing System with dual output channels. In the example shown, each channel is capable of continuous charging or discharging at 210 A DC and voltages up to 700 V DC. Filters are incorporated to provide a ripple-free output. The configuration is fully regenerative and has redundant contactors to safely isolate the testing system from the device under test.

Specifications

Input	
Voltage:	200 to 690 V AC, three-phase
Frequency:	50 / 60 Hz
Power factor:	> 99%
Total harmonic distortion (THD):	< 5%
Isolation transformer:	Yes
Output	
Maximum voltage:	350, 700, 900, or 1000 V DC ¹
Minimum voltage:	1% of maximum, typical
Current and power:	Refer to table below
Voltage ripple:	< 0.1 V DC, typical
Current ripple:	< 0.1 A DC, typical
Voltage step response:	< 10 ms
Current step response:	< 1 ms
Protection	
Extensive electronic protective and diagnostic features are included	
Packaging	
Standard enclosure:	NEMA 1 (IP20) or NEMA 12 (IP55)
Standard cooling:	Air
Optional cooling:	Water/glycol
Standards	
Available approvals:	UL, cUL, CE, IEEE-519

Selected Ratings

Output ¹ V DC maximum	Rating at Each Output ²		Combined Output Rating ³	
	A DC continuous	kW continuous	A DC continuous	kW continuous
350	250	75	500	150
350	385	116	770	231
350	405	122	810	243
350	565	170	1,130	339
350	630	189	1,260	378
700	210	126	420	252
700	315	189	630	378
700	490	294	980	588
900	279	212	558	424
900	355	270	710	540
900	434	330	868	660
1,000	234	198	468	395
1,000	340	287	680	575
1,000	364	308	728	615

Continuous Ratings

Continuous ratings assume 120% overload capability for one minute.

Rating Extensions

The table above illustrates a subset of available ratings. Unico's system construction allows considerable flexibility to achieve either higher or lower ratings than shown. Contact Unico for more options.

- 1 Some models can be connected in series to achieve approximately double the standard voltage rating.
- 2 Other current and power ratings are available.
- 3 Multiple units can be connected in parallel to achieve a proportional increase in continuous currents and powers.

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Unico is a leading global innovator of motion-control solutions for industry. Founded in 1967, the company develops, manufactures, and services variable-speed drives, application-engineered drive products, integrated drive systems, and ancillary products that improve operations by increasing productivity, safety, and equipment life while lowering energy and maintenance costs.

All trade designations are provided without reference to the rights of their respective owners.

Specifications subject to change without notice.