

EV HEV PHEV and Energy Storage Battery Test System

The Series 8500 is a range of high power fully automated test systems designed for testing the performance characteristics of Electric Vehicle and Energy Storage batteries under real world conditions. This high specification system is designed with the capability to allow the electrical energy produced during discharge to be returned to the electrical grid.



The Series 8500 can be supplied as either a single or a multiple channel system. Systems are supplied as standard for continuous operation at the specified power level with power limited systems available as an option. Using Maccor's standard fully featured battery test software the Series 8500 can perform virtually any type of battery test including FUDS, SFUDS, DST etc. for electric vehicle batteries and standard cycling tests for energy storage devices. With test channel ratings from 100V to 1000V, currents up to 1000A and with the highest accuracy available for this type of equipment, the Series 8500 is the perfect system for your high power battery testing application.

Applications include testing of:

- EV, HEV, PHEV batteries of all chemistries
- Energy Storage batteries
- Drivetrains, Electric Motors
- High Power PV systems
- High Power Fuel Cells

Maccor's proprietary G₂B (AC Grid to Battery) and B²G (Battery to AC Grid) system allows testing at high power levels with minimal net electrical energy use.

Maccor Inc. is a USA based manufacturer of battery test systems. We design and develop all of our own hardware and software. For nearly 25 years this has been our only business and we are considered the Gold standard in the battery test industry worldwide. With voltage ranges from 5V to 1000V, and currents spanning 300nA to 2000A, systems are available for multiple applications ranging from R&D to manufacturing to end-users. The accuracy, capability, and reliability of our test systems are second to none, and our products are backed by experienced technical sales and support personnel.

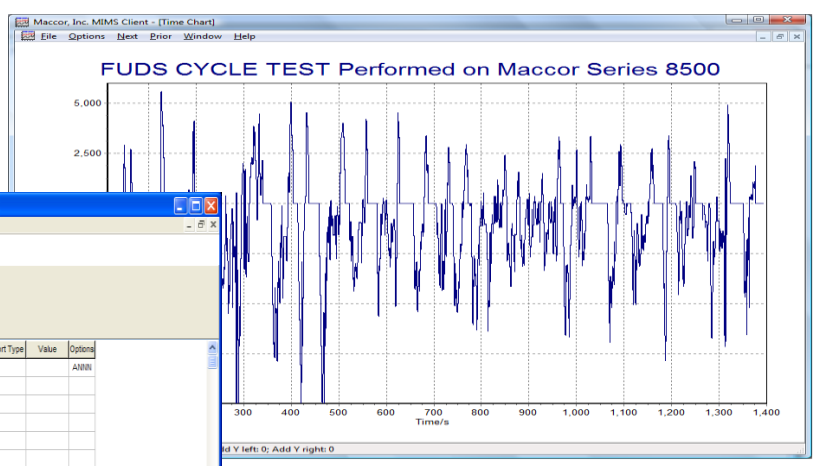
Features and Benefits

- Electrical energy is returned to the AC grid during discharge – Reduces energy costs and no additional cooling system is required.
- Accuracy as much as 10 times better than other available systems – Accurate data is what you need; accurate data is what you get.
- Easy to use standard Maccor battery test system software – No programming or scripting experience required, minimal operator training, tried and tested
- 100% duty cycle standard – No system power limit, test channel rated for continuous operation at full power, allows use in testing very high power storage batteries and PV systems.
- Drive Cycle Simulation – Waveforms can be imported into the test procedure to increase test efficiency and reduce potential operator error.
- Flexible CAN-Bus interface available as an option – Has the ability to create CAN profiles for any battery with no 3rd party package required, optional use for control of test flow.
- Exceeds IEEE 519 standard for Harmonic Control – Essential for meeting most utility company requirements, and necessary to limit interference with other laboratory/factory equipment.
- Individual test steps can be programmed to operate in any combination of operating modes from constant current, voltage, power or resistance – Can be used for multiple applications with any battery chemistry.
- Local emergency cut-off switch, automatic shutdown on loss of AC power, reverse voltage protection, internal circuit breakers – Provides a high level of safety
- Automatic scaling of data in W/kg or C-rate for drive cycle simulation programs and other test procedures – Reduces operator workload
- High speed switching of current levels – Ensures maximum accuracy in Ah/Wh calculation.
- 50 mS time resolution – Provides a high level of accuracy for both control and measurement
- Real time data and graphics – Allows battery performance to be visually monitored at any time as the test progresses

The Series 8500 is supplied as a complete turnkey system consisting of a test cabinet, PC computer, test software, data acquisition and analysis software. The test cabinet, with a distributed architecture, is connected to the tester PC via an Ethernet communications network.



FUDS cycle profile



Build Test - [C:\Maccor\procedur\Example.000]

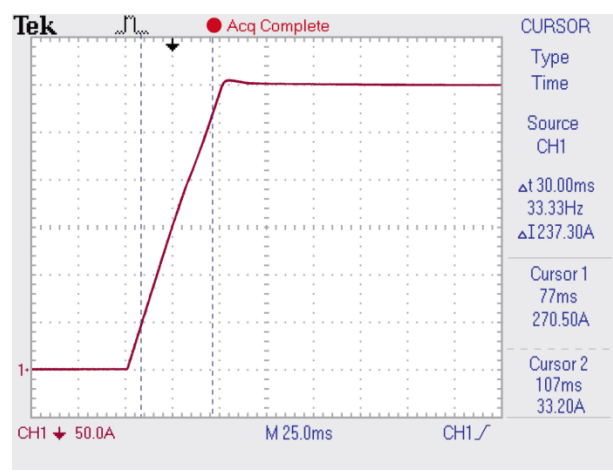
Description
Super Test Procedure
Step 12 Note (Enter up to an 80 character description for each step)

Step	Type	Mode	Value	Limit	Value	End Type	Op	Value	Goto	Report Type	Value	Options	
1	Rest					Step Time	=	00:00:01	002			ANNN	
2	Dot												
3	Advance Cycle												
4	Discharge	Current	0.5		Voltage	<=		1.1	005	Step Time	00:00:15	479H	
					Step Time	=		06:00:00	005				
5	Charge	Current	0.50004		Voltage	2.086	Step Time	=	12:00:00	006	Step Time	00:00:15	ANNN
6	Loop#				Loop Count	=		4	007				
7	Rest				Step Time	=		00:05:00	008			ANNN	

Step: 12 Column: 1 Row: 24

Easy to use menu driven build test program

Fast current rise time with negligible overshoot



View Data

Name: IScreen2Test Procedure: IScm2
 Channel: 49 Description:
 Tester: Conference S Cap: 1.0
 Started: 31 January 2006, 11:21:00 AM C Rate: 0.0
 Comment:

Rec	Cycle	Step	Test Time (min)	Step Time (min)	Capacity	Energy	Current	Voltage	MD	ES	DPT
1	0	1	0	0	0	0	0	1.369	RR	0	01/31
2	0	1	0:08	0:08	0	0	0	1.369	RR	129	01/31
3	0	2	0:08	0	0	0	0.999	0.924	D	0	01/31
4	0	2	2:08	2	0.033	0.023	1	0.649	D	1	01/31
5	0	2	4:08	4	0.067	0.044	1	0.629	D	1	01/31
6	0	2	6:08	6	0.1	0.065	1	0.605	D	1	01/31
7	0	2	8:08	8	0.133	0.095	1	0.577	D	1	01/31
8	0	2	10:08	10	0.167	0.103	1	0.545	D	1	01/31
9	0	2	12:08	12	0.2	0.121	1	0.513	D	1	01/31
10	0	2	14:08	14	0.233	0.137	1	0.478	D	1	01/31
11	0	2	16:08	16	0.267	0.153	1	0.435	D	1	01/31
12	0	2	18:08	18	0.3	0.166	1	0.38	D	1	01/31
13	0	2	20:08	20	0.333	0.178	1	0.287	D	1	01/31
14	0	2	22:08	22	0.366	0.184	0.786	0.099	0	1	01/31
15	0	2	24:08	24	0.381	0.185	0.327	0.1	0	1	01/31
16	0	2	26:08	26	0.392	0.186	0.295	0.1	0	1	01/31
17	0	2	28:08	28	0.401	0.187	0.281	0.1	0	1	01/31
18	0	2	30:08	30	0.41	0.188	0.272	0.1	0	1	01/31
19	0	2	32:08	32	0.419	0.189	0.263	0.1	0	1	01/31

Filter: Off Test is Active Total Records: 27

Real time data acquisition and graphics



Technical Specifications

Maximum Voltage Range	Customer specified from 100V to 1000V
Minimum Voltage	5% of full scale voltage
Maximum Current Range	Customer specified from 100A to 1000A
Minimum Current	2% of full scale current
Maximum Continuous Power	10KW to 1MW
Measurement Accuracy	± 0.05% of full scale
Control Accuracy	± 0.10% of full scale
Resolution	16 –bit (1 part in 65,536)
Maximum No. of Test Cycles	2 ³²
Maximum No. of Waveform Steps	2 ¹⁶
Maximum No. of Test Steps	128
Minimum Step Time	50mS
Minimum Data Sampling Rate	50mS
Current Rise Time	T ₉₀ < 30mS
Input Power Supply	380/440/480VAC, +10% -15%, 3-phase, 50/60Hz
Total Harmonic Distortion	< 3.0%
Dimensions and weight will vary with system voltage and power	Contact Maccor for details

Options

- Auxiliary Voltage, Thermocouple, Thermistor and Pressure Inputs
- CAN Bus, I²C, SMB Interfaces
- Digital I/O
- Interface with Temperature Test Chamber
- Test Channel Power Limit
- Remote Emergency shut off
- Local light pole status indicator



Medium Power 200 KW Version

Worldwide sales and technical support is available for the Series 8500. Please contact Maccor for your nearest representative or visit our web site at www.maccor.com

MACCOR

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