

# HELLi-Ion

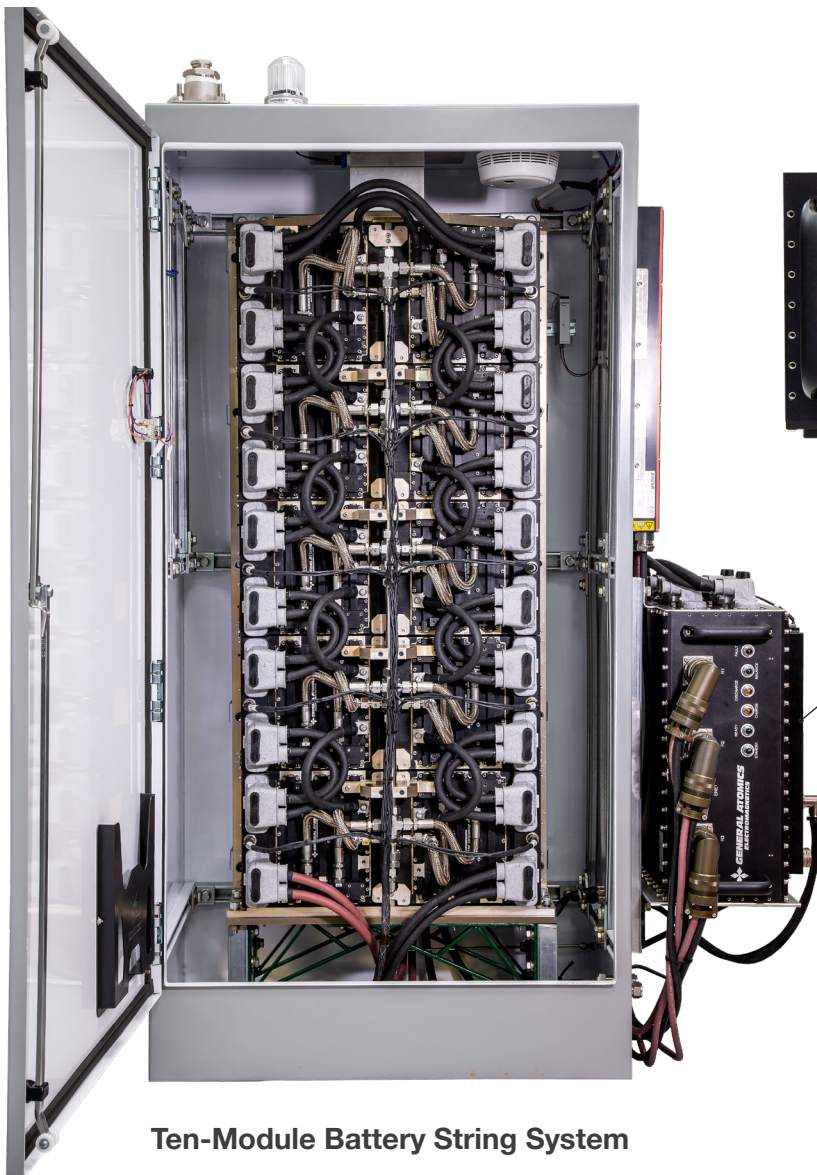
HIGH ENERGY LASER LITHIUM-ION BATTERY SYSTEM



General Atomics Electromagnetic Systems (GA-EMS) is highly regarded for its high energy and power dense battery solutions that meet stringent Department of Defense requirements. Our HELLi-Ion™ Battery System is a modular, compact energy storage system capable of supporting the power needs of tactical directed energy systems and High Energy Laser (HEL) applications.

# HELLi-Ion BATTERY SYSTEM

- High energy and ultra high power in a significantly reduced footprint
- Scalable to suit airborne and vehicle-mounted platforms or facility installations
- Modular, fault-tolerant design prioritizes safety, performance and reliability
- Air, liquid or conduction-cooled interfaces available
- MIL-PRF-29595 performance tested and NAVSEA S9310 safety certified
- Battery Management System (BMS) with built-in charger available



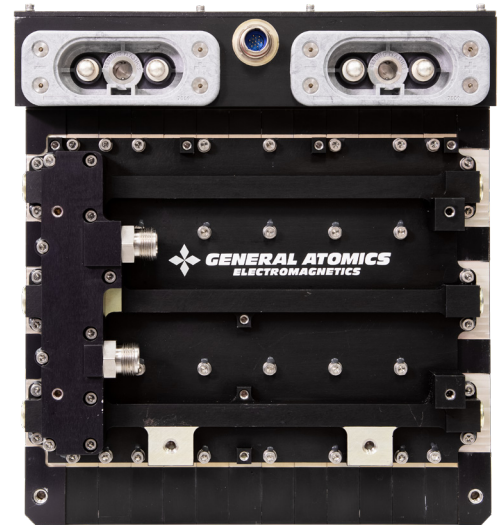
## HELLi-Ion Battery Management System



The HELLi-Ion Battery System utilizes specialized Lithium-Ion prismatic cell technology to enable extremely high power density in a small, compact package. The BMS monitors and controls battery operation to ensure optimal safety, performance and reliability.

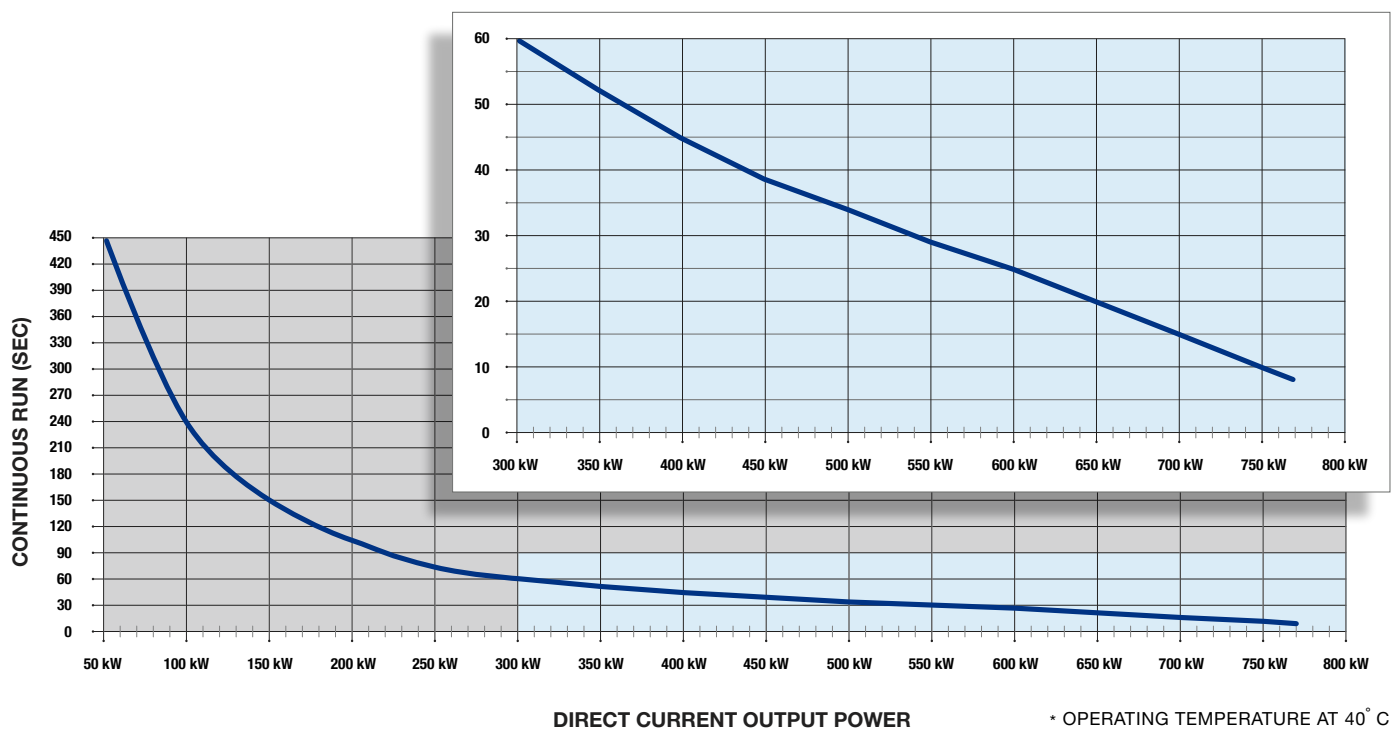
The HELLi-Ion Battery System is scalable to meet specific energy storage requirements with systems ranging from a single battery module to multiple-rack configurations.

The specifications provided below are for a typical 10-module battery string. The HELLi-Ion Battery System can be tailored to meet platform and system requirements.



**Gen-3 Battery Module  
(Liquid-Cooled)**

### TYPICAL 10-MODULE BATTERY STRING



# SPECIFICATIONS

SPECIFICATIONS FOR A TYPICAL 10-MODULE BATTERY SYSTEM	
Output Voltage	300-492 VDC
Output Current	2,000 Amps (maximum)
Output Power	600 kW (nominal) 750 kW (maximum)
Usable Energy	Up to 30 Mega-Joules 8.3 kW-hr
Batteries Duty Cycle (batteries can be operated with any of these cooling modes)	
- Cooled by Natural Convection	5% Duty Factor
- Cooled by Forced Air Convection	10% Duty Factor
- Cooled by Water	>25% Duty Factor
Energy Capacity: variable with output power Operating Temperature at 40°C (see graph on page 3)	147 sec @ 150 kW 63 sec @ 300 kW 25 sec @ 600 kW 15 sec @ 700 kW 10 sec @ 750 kW
10-Module Battery String Size/Weight (nominal)	Size (volume): 15,600 in <sup>3</sup> 10.25 in L x 26 in W x 55.25 in H Total weight: 739 lbs
BATTERY CHARGER	
Output Power	Up to 57 kW 95 – 98% efficient
Charger Input Voltage	270 to 600 VDC (nominal)
Charger Input Power (programmable)	Up to 60 kW (maximum, per string)
BATTERY MANAGEMENT SYSTEM	
Battery Management System Size/Weight (nominal)	Size (volume): 5400 in <sup>3</sup> 22 in. L x 22 in. W x 11 in. H Weight: 80 lbs
HELLi-Ion BATTERY MODULE	
Nominal Capacity	18 Ah @ C/5 @ 20° C
Nominal Weight	64 lbs (Liquid-Cooled), 45 lbs (Air-Cooled)
Nominal Output Voltage	48 VDC
Maximum Discharge Current (continuous)	2000 A
Specific Power (continuous)	>4 kW/kg
Specific Power (pulse)	>5 kW/kg
AC Impedance @ 1 kHz	<3.6 mΩ @ 50% State of Charge @ 40° C
Operating Temperature	0 - 71° C

Contact GA-EMS to find out more about configuration options.