

## Extreme Environment and High Voltage BLDC Controller

Motiv's SIERRA Controller line is specifically designed for use under extreme environmental conditions. Initially developed for lunar applications requiring 'Survive the Night' and 'Operate Through the Night' capabilities the controller is designed to start up and function under cryogenic environmental conditions. The SIERRA utilizes a single axis motor controller card with integrated capabilities for electromagnetic brake controls and supports 6-Step Commutation via Halls or Resolver while delivering up to 2.4 kW of power.

Baselined with 100kRad tolerant parts, the SIERRA not only can be used for lunar applications but also Deep Space missions to outer planets and asteroids. The SIERRA architecture maintains power level and modular construction flexibility while utilizing extensive fault protection features including motor winding faults, temperature monitoring, and radiation effects. The SIERRA controller has been designed with extreme environment considerations including additional sealing capabilities to prevent regolith or dust intrusion.

For requests or questions send to: [info@motivss.com](mailto:info@motivss.com)



SIERRA Controller

PERFORMANCE	VALUES
Input Voltage Range	120V (24-158V)
Motor Continuous Current	15A rms
Motor Peak Current (10 sec)	20A rms
Quiescent Power	<4W
Commutation Sensing	Hall Effect Sensor, Resolver
Sensing	<ul style="list-style-type: none"> <li>• Resolver</li> <li>• Potentiometer</li> <li>• Temperature</li> <li>• Limit Switches</li> </ul>
Motor Speed Support	0-10,000 RPM (typical)
Communication Bus Options	Standard: RS-422/485
Control Modes	Brushless / Servo: <ul style="list-style-type: none"> <li>• Position</li> <li>• Velocity</li> <li>• Current</li> </ul>
Applications	<ul style="list-style-type: none"> <li>• Wheel Drives and Mobility Systems</li> <li>• Lunar Infrastructure</li> <li>• Turret Drives</li> <li>• Telescope Mechanisms</li> <li>• Drill Heads</li> <li>• Manipulators</li> <li>• Antenna and Panel Deployment</li> <li>• 'Survive the Night' Applications</li> </ul>

ENVIRONMENTAL	VALUES
STD Operating Temperature	-70C° to +60C°
Extended Operating Temperature	-180C° to +60C°
Survival Temperature	-190C° to +125C°
Random/Sine Vibration	GEVS Standard
Radiation Tolerance TID SEU LET Threshold	100 kRad (>75 MeV-cm2/mg)
Orbit/Mission Support	Lunar, Deep Space
EMI/EMC Filter	Not Included
PHYSICAL	VALUES
Dimensions (packaged)	8.5" x 8.4" x 3.3" 21.5cm x 21.2cm x 8.3cm
Mass/Weight	5.1 lbs 2.3 Kg
Available EEE Classes	Level 2/3 per EEE-INST-002
Available Hardware Models	EDU/EM/FM

### EXPORT RESTRICTIONS

Export of Motiv Motor Controllers is controlled under Export Control Classification Number (ECCN) 9A515.x and is available for sales in the countries listed in Group A:5.

