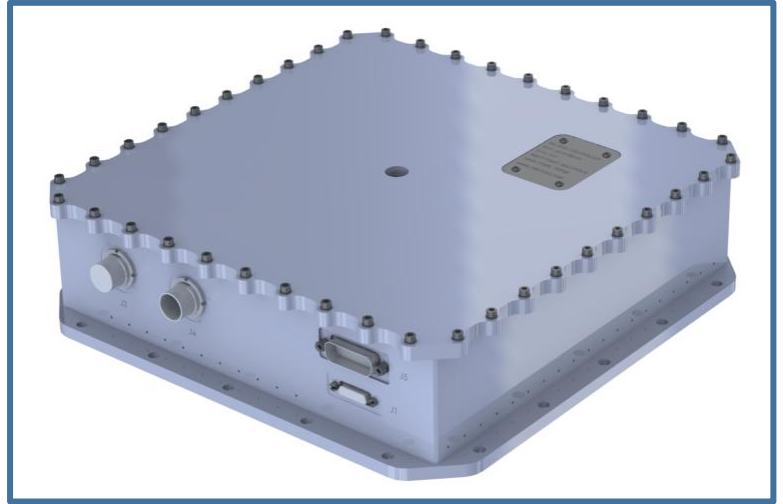


Stirling Convertor Space Controller (SCSC)



The Stirling Convertor Space Controller (SCSC), developed by West Coast Solutions, is a complete and self-contained, space-compatible, radiation hardened electronic controller for use with Stirling Convertors such as the Sunpower Robust Stirling Convertor (SRSC).

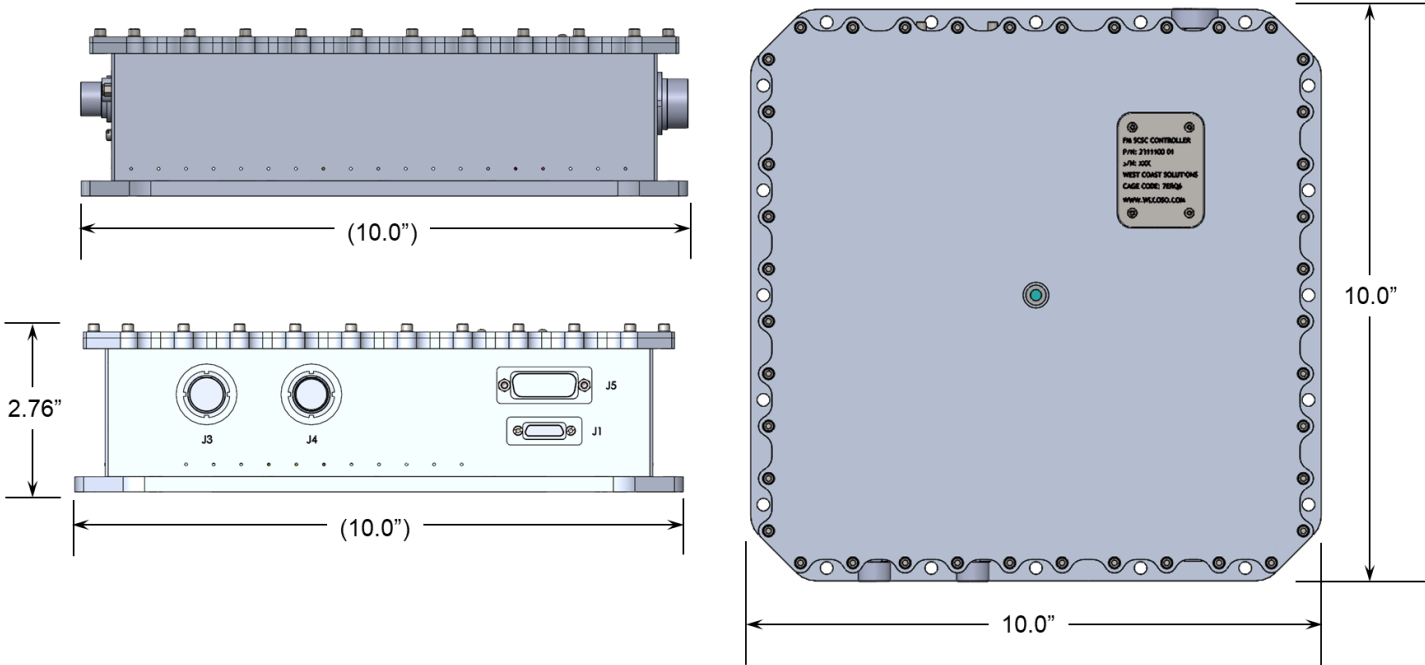


The SCSC includes circuitry and control logic required to fully and safely control the Stirling Convertor during startup, operation and shutdown operations. SCSC receives and conditions AC power from the Stirling Convertor while providing regulated output to downstream loads. The system is capable of providing both constant voltage and constant current output, in addition to battery charge control. SCSC also includes dual / redundant shunt regulators such that excess generated power can be dissipated in external resistive shunts. Additionally, SCSC is capable of vibration measurement, processing and control via drive of an active vibration balancer mechanism. SCSC will undergo environmental qualification testing to TRL 6 by Q1 2026.

- High reliability, radiation hardened space design to be qualified to Technology Readiness Level 6 by Q1 2026
- Capable of full Stirling Convertor control including motoring, stall, steady-state operation, and hot-end temperature control
- Capable of providing constant voltage / current output in addition to battery charge control
- Dual resistive shunt controllers for dissipation of excess generated power
- Includes vibration measurement circuitry and logic in addition to a dedicated active balancer drive for vibration cancellation purposes

Results ... Delivered.

Stirling Convertor Space Controller (SCSC)



Summary of SCSC Specifications

Specification	Value
Convertor Input Capability	Terminal voltage/current/power to 28 Vrms/10 Arms/100 W
Bus Output	Regulated 22 – 36 V, CV / CC / Battery Charge modes
Excess Power Shunt Capability	Up to 100 W for each of the two shunts
Efficiency (Stirling Convertor to bus)	~83% incl. Tare (70 W _{ac} Convertor input, 58 W _{dc} output to bus)
Vibration Balancer Drive	Up to 10 Vrms / 1.5 Arms
Vibration Sense	100 pC/G accelerometer, maximum input of ± 20 G
Envelope / Mass	10.0" x 10.0" x 2.76", ~3.4 kg for main controller chassis
Thermal Management	Conductive cooling through mounting surface
Operating Temperature Range	-20 °C to +60 °C
Storage Temperature Range	At Least -40 °C to +75 °C
Random Vibration	GEVS Spec for Component Qualification (14.1 grms)
Shock	GEVS Component Test SRS for Standard Electronics
Radiation Hardness (TID)	All components ≥ 75 kRad
Radiation Hardness (SEE LET)	All components ≥ 75 MeV-cm ² /mg
Command and Control Interfaces	RS-422
Temperature Sensor Support	2x type-N (Convertor hot end) + 8x type-K thermocouples

Results ... Delivered.