

NOVA TEST FACILITY

NANOSAT OPERATION VERIFICATION & ASSESSMENT TEST FACILITY

OVERVIEW

SDL's advanced test facility characterizes and verifies subsystem and system performance of small satellites up to 10 kg. The NOVA test facility provides testing to reduce preflight risk and verify requirements and is designed specifically for Cubesat-sized components and systems. NOVA augments SDL's manufacturing, environmental testing, and calibration facilities, offering comprehensive testing capabilities and expertise for this class of small satellites.



TEST FACILITY •



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CAPABILITIES	FOR TESTING OF:
High accuracy mass properties testing for measurement of mass, center of gravity (CG), and moments of inertia (MOI)	<ul style="list-style-type: none"> • Component mass, CG, and MOI • System mass, CG, and MOI
High accuracy 3-axis magnetic field generation with real-time closed-loop control and zero-gauss chamber for magnetometer calibration	<ul style="list-style-type: none"> • Torque and alignment from torque coils and permanent magnets • Accuracy and alignment of magnetometers
Motor speed, jitter, and torque measurement	<ul style="list-style-type: none"> • Reaction wheel, control-moment gyro, momentum wheel, or similar system characterization and performance
Sun simulator with two axis precision control	<ul style="list-style-type: none"> • Sun sensor system characterization and performance
Solar illumination simulator and NIST-traceable pyrometer	<ul style="list-style-type: none"> • Solar panel power output verification • System testing using self-generated power (test algorithms, controls, interfaces)
Hardware-in-the-loop system testing	<ul style="list-style-type: none"> • Test and verification of system interfaces, algorithms, and flight software



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A key component of the system-level testing is the HWIL simulation; the component test stations must provide high-fidelity models.

Zero-Gauss Chamber



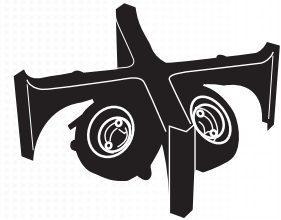
Air Bearing



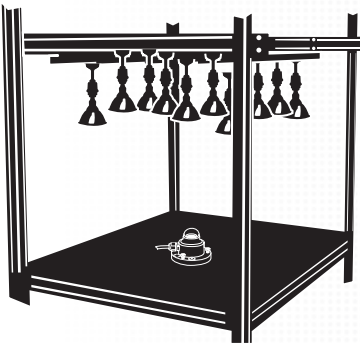
Magnetometer /
Torquer Coil Testing

The magnetic test cell for torquer coils and magnetometers uses a 3-axis Helmholtz cage with a field which can be rotated in real time using closed-loop control to within 10 nanoTesla. The two-meter cage provides a 60-cm working volume. Dual differential magnetometers and a zero-gauss chamber will provide highly accurate results.

The reaction wheel test cell measures wheel speed very accurately using 400 MHz sampling, derives the torque analytically and enables characterization of wheel jitter.



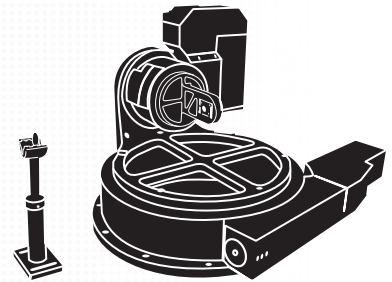
Reaction Wheel Testing



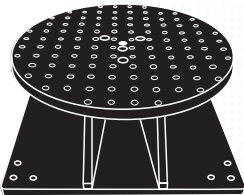
Solar Panel Testing

The solar panel test cell provides a continuous AM0 light source to verify the power output of the solar arrays to a class BBA (IEC 60904-9). A NIST-traceable pyranometer is used to measure the light intensity in the target area.

The sun sensor test cell uses a simulated sun source and a 2-axis gimbal with 0.002° repeatability and 0.01° degree accuracy.

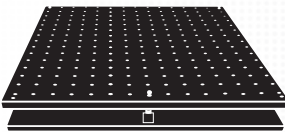


Sun Sensor Testing



Inertia Table

The mass properties test cell features load cells and kinematic mounts to obtain the measurements needed to verify and refine the calculations from the CAD models, and to statically and dynamically balance the spacecraft. Mass can be measured within 2 grams (3σ) and center of gravity to within 1 mm (3σ).



Mass Table



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