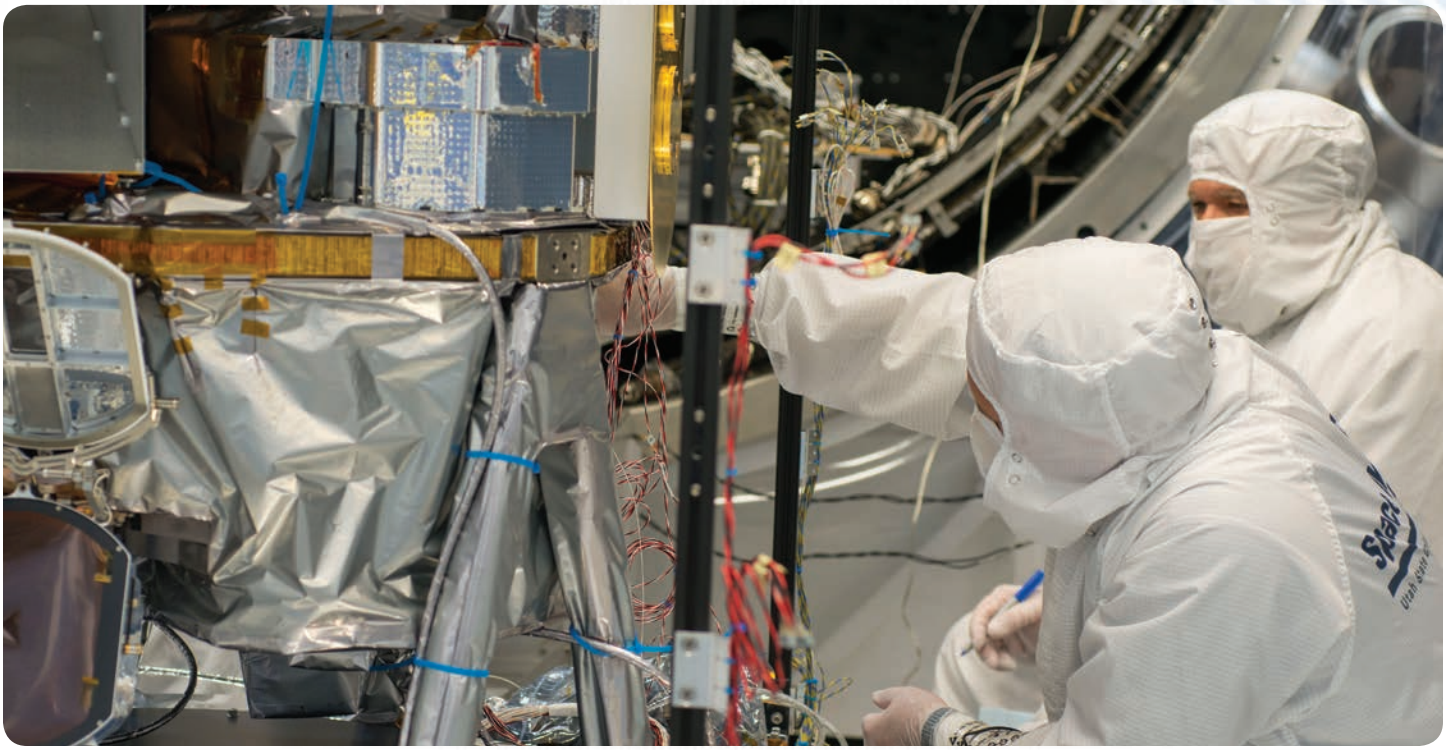
SDL/11-016C

SPACE DYNAMICS LABORATORY

CALIBRATION & TESTING



WHY CALIBRATE?

Once you have designed and built a sensor, it is essential that you calibrate it—especially when it comes to space instruments. Calibration is the only way to translate your raw sensor data into scientific units that can be analyzed for vital information. Science can only occur when you have calibrated data.

In addition, calibration helps you verify that your sensor meets the requirements and helps to identify performance issues under operational conditions before you fly. Thorough calibration testing before deployment significantly increases the probability of mission success.

WHY CHOOSE SDL?

For over 40 years, the Space Dynamics Laboratory (SDL) has built an international reputation as a state-of-the-art calibration and test facility. SDL's highly-educated calibration team specializes in designing, building, calibrating, and characterizing diverse electro-optical sensor systems and associated test equipment for both in-house and customer programs. Our team has been working together for years and knows how to troubleshoot any issues that may arise.

SDL has calibrated many NASA and DoD instruments, including ABIR, AFT, CHIRP, FIRST, GIFTS, MKV, NFIRE, SABER, SOFIE, SPIRIT III, and WISE.

COMPREHENSIVE SERVICES PROVIDED AT SDL

SDL can manage and run every aspect of a full testing and calibration program, from beginning to end. We specialize in:

- Detailed test planning
- Design & fabrication of test equipment
- Smooth integration
- Efficient test automation & execution
- Proven approaches for data collection & processing
- Comprehensive data analysis
- Cutting-edge cleanliness control, monitoring & analysis

SDL can provide any or all of the above calibration services at our facility or customer locations using SDL-owned or customer-provided equipment.

Space Dynamics LABORATORY
Utah State University Research Foundation

SPACE DYNAMICS LABORATORY

CALIBRATION & TESTING

DESIGN, FABRICATION & TEST OF CALIBRATION SYSTEMS
- IR, visible & UV
- Cryogenic- & vacuum-compatible

ENVIRONMENTAL TESTING
- Thermal-vacuum testing
- Vibration, shock
- EMI/EMC
- Altitude testing (temperature & pressure)

SENSOR CHARACTERIZATION TESTING

SDL can determine the following sensor characteristics using our proven data collection and analysis methods:

MEASURE AND VALIDATE SPATIAL PERFORMANCE
- Point-response function (PRF)
- Modulation transfer function (MTF)
- Effective field of view (FOV)
- Optical distortion
- Scatter
- Closely-spaced object (CSO) response
- Ensquared/encircled energy

VALIDATE RADIOMETRIC PERFORMANCE
- Radiometric responsivity
  - Radiance & irradiance
  - Response linearity with uniformity corrections
  - Nominal/outlying pixel identification
- Polarization sensitivity

TEMPORAL RESPONSIVITY PERFORMANCE
- Short, medium & long-term repeatability
- Frequency response

VALIDATE SPECTRAL PERFORMANCE
- Sensor-level relative spectral response (RSR)

SENSOR PERFORMANCE VS TEMPERATURE

FULL SUITE OF TEST EQUIPMENT

SDL maintains a full suite of EO calibration and test systems. We are capable of performing calibrations for several customers simultaneously with appropriate firewalls in place to assure confidentiality. Many of our systems are transportable to customer sites. SDL's calibration systems are traceable to the National Institute of standards and Technology (NIST).

CALIBRATION COLLIMATOR CHAMBERS
Enable spatial & irradiance calibrations
- MIC1, MIC2, MIC3, MIC5

THERMAL VACUUM CHAMBERS
Simulate the space environment & enable sensors to reach in-flight temperatures
- THOR, GIFTS & several smaller chambers

AIRBORNE TEST CHAMBER
Simulates the airborne environment for optical sensors
- Altitude test chamber

EXTENDED-AREA SOURCES
Enable radiance calibration
- LWIRCS, HAES15

TRANSFER RADIOMETER
Transfers calibrations from SDL sources to customer equipment & is used to characterize sources
- SDL-XR

SPECTRAL CALIBRATION EQUIPMENT
Enables spectral calibrations
- Filter characterization system (FCS), Fourier Transform Spectrometers (FTS), Monochromator