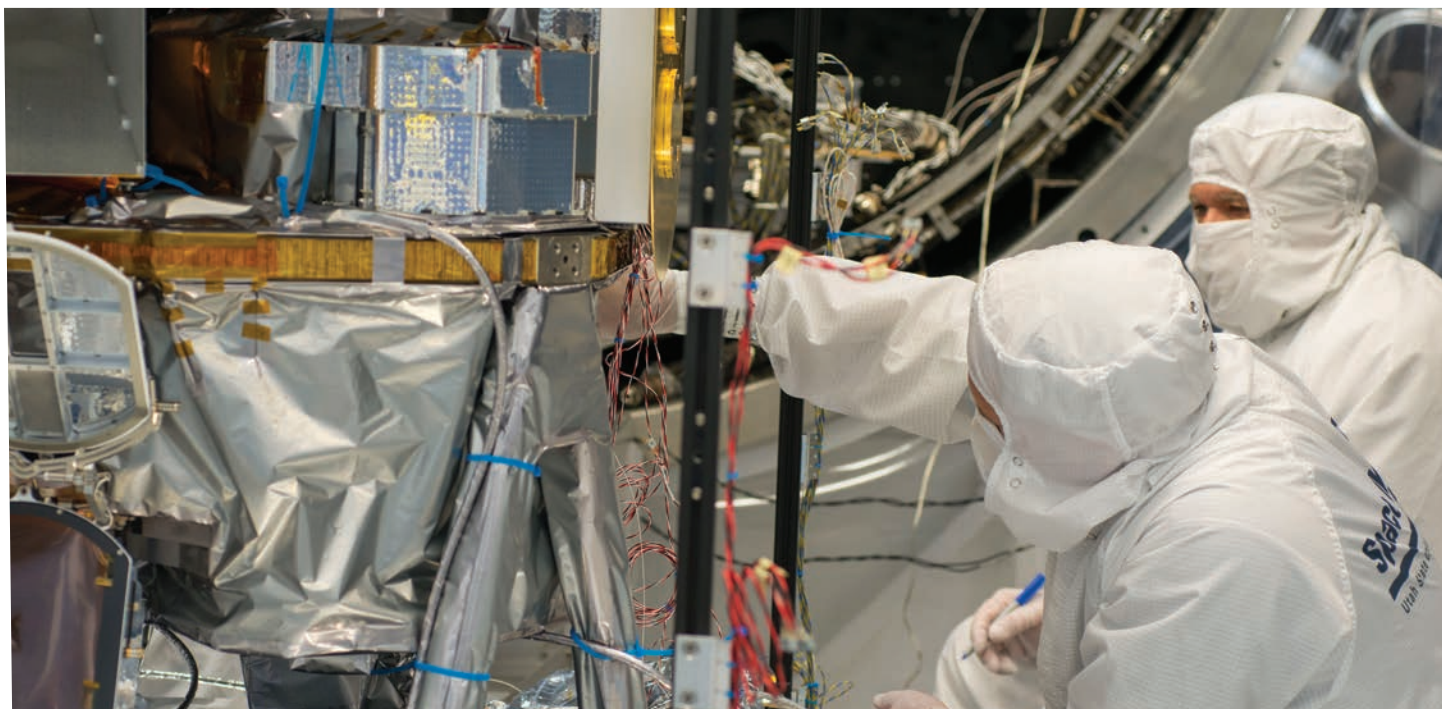


CALIBRATION & TESTING



WHY CALIBRATE?

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

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

WHY CHOOSE SDL?

For over 50 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. SDL's 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. SDL specializes in:

- Detailed test planning
- Design and fabrication of test equipment
- Smooth integration
- Efficient test automation and execution
- Proven approaches for data collection and processing
- Comprehensive data analysis
- Cutting-edge cleanliness control, monitoring, and analysis
- Calibration services offered on site or at customer locations using SDL-owned or customer-provided equipment

Space Dynamics[™]
LABORATORY
Utah State University

CALIBRATION & TESTING

DESIGN, FABRICATION & TEST OF CALIBRATION SYSTEMS

- IR, visible, and UV
- Cryogenic- and vacuum-compatible

ENVIRONMENTAL TESTING

- Thermal-vacuum testing
- Vibration, shock
- EMI/EMC
- Altitude testing (temperature and pressure)

SENSOR CHARACTERIZATION TESTING

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

MEASURE & 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 and irradiance
 - Response linearity with uniformity corrections
 - Nominal/outlying pixel identification
- Polarization sensitivity

TEMPORAL RESPONSIVITY PERFORMANCE

- Short-, medium-, and 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 and is capable of performing calibrations for several customers simultaneously with appropriate firewalls in place to assure confidentiality. Many 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 and irradiance calibrations

- MIC1, MIC2, MIC3, and MIC5

THERMAL VACUUM CHAMBERS

Simulate the space environment and enable sensors to reach in-flight temperatures

- THOR, GIFTS, and 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 and is used to characterize sources

- SDL-XR

SPECTRAL CALIBRATION EQUIPMENT

Enables spectral calibrations

- Filter characterization system (FCS), Fourier Transform Spectrometers (FTS), Monochromator