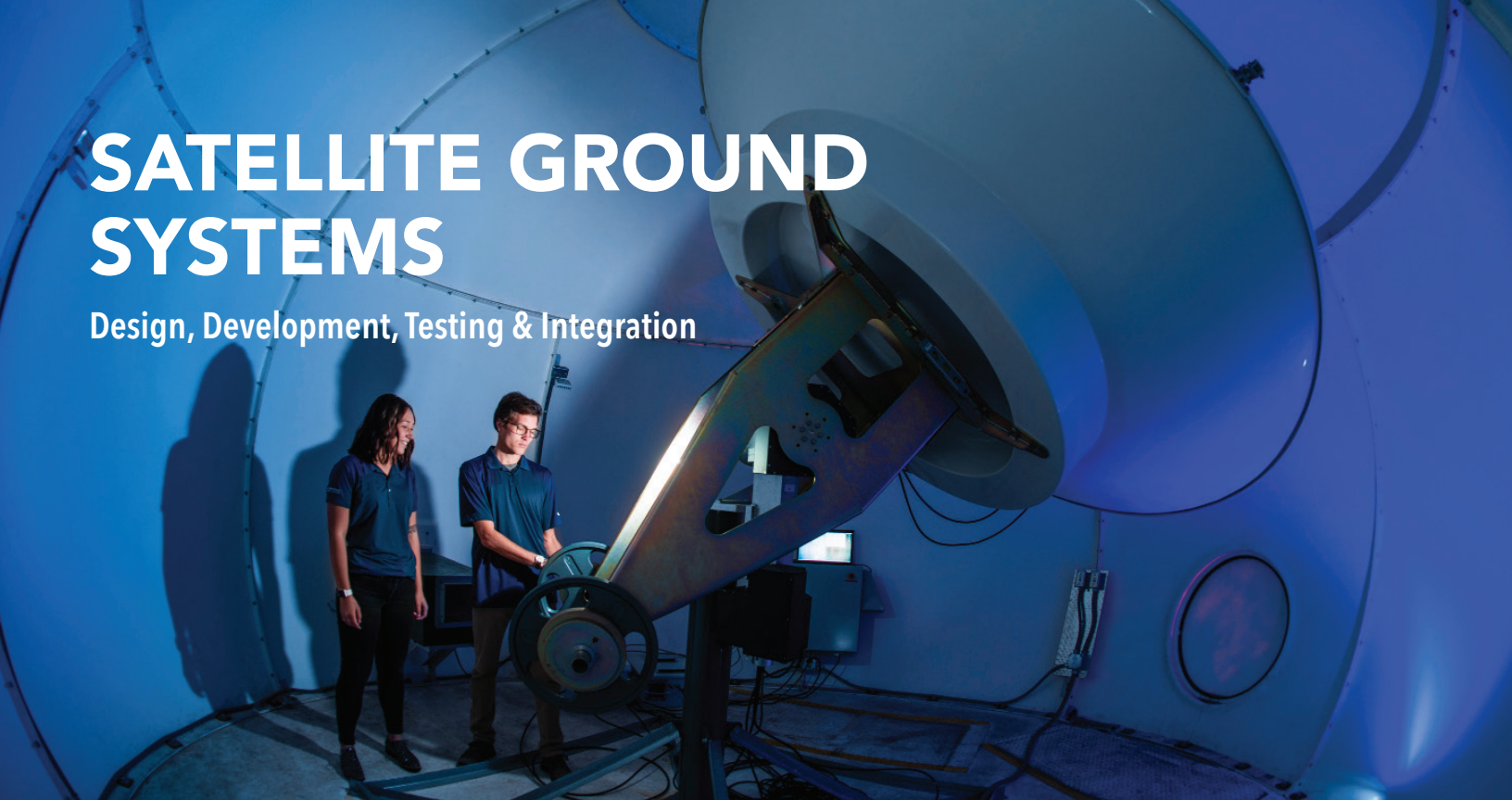# SATELLITE GROUND SYSTEMS

Design, Development, Testing & Integration

Even the most advanced flight vehicles require a comprehensive ground approach. The Space Dynamics Laboratory (SDL) provides complete ground system development and support. Our experienced team designs, tests, integrates, and operates ground systems, ensuring the readiness of all system components for mission success.

SDL has invaluable experience integrating mission operations, ground terminals, and spacecraft through highly modular and configurable systems. SDL's software manages communications between these stations and includes antenna pointing, satellite tracking, software-defined radios, pass scheduling, system health and status monitoring, and automated terminal operations. Built on common web standards and messaging protocols, the software is easy to deploy and operate. The coordinated communication it provides minimizes the manpower and expense of supporting multiple missions simultaneously.

The ground systems team at SDL is experienced in ground compatibility testing and can accommodate a variety of ground networks. SDL also assists with system integration, secure cloud deployment, accreditation, and administration, offering customers complete system implementation and management from a single expert partner.

Maximum component configurability for cloud or on-premises deployment.

On-Orbit Operations | Signal Processing | Encryption | Processing Packetization (CCSDS) | Mission Operations Software | Ground System Control

FEATURES

MISSION MANAGEMENT

- Ground resource management
- Secure/classified cloud configuration & management
- Ground network monitoring
- Modular, distributed software design
- NIST 800-53 compliant code analysis & reporting
- Unlimited rights to Government with no licensing fees
- Flight heritage with Government customers

END-TO-END INTEGRATION

- Ground hardware integration & control
- MC3, KSAT, AWS ground network compatibility
- Front-end processor design & integration
- Hardware/software encryption & data encapsulation integration
- Physical network connectivity

SOFTWARE-DEFINED RADIO (SDR)

- SDR development; commercial & open-source SDR integration
- Graphics processing unit (GPU) parallelization
- Over-the-air radio frequency (RF) testing
- Multi-band frequency operations & testing
- OQPSK, GFSK & GMSK waveforms
- Software Doppler adjustment & testing

SATELLITE GROUND SYSTEMS Design, Development, Testing & Integration

WHY CHOOSE SDL?

As a University Affiliated Research Center (UARC) and trusted agent of the Government for over 60 years, SDL is in a unique position to provide independent assessment, respond quickly to evolving requirements, and develop solutions that include Government unlimited rights.

GROUND SYSTEM SOFTWARE

SDL's ground system software is distinctive for ease of use. Through a simple client interface, mission operators can define operational procedures, schedule satellite passes, and connect with ground terminals to perform live space-to-ground contacts. Operators can easily uplink commands and obtain telemetry data without the need to understand the underlying complexity of the ground network.

Several existing radio ground terminal networks are currently supported. The flexible and extensible software design supports the addition of new hardware and ground systems to active ground networks, supports additional ground networks, and can leverage multiple ground networks simultaneously.

SDL's interface provides secure communication between spacecraft and ground systems, ensuring that data is passed from satellite to operator without interpretation, manipulation, or decryption.

ISO 9001 COMPLIANT

SDL developed its ground system software suite in compliance with ISO 9001 registered Quality Management System software development procedures. These procedures include a documented method to control and verify software development to ensure that the finished product meets specified requirements within schedule and budget.

This is accomplished through measurable benchmarks and traceability using the following:

• Feature-driven agile development
• Formal inspections & peer reviews
• Static & dynamic code analysis
• Formal validation & acceptance tests
• Automated regression tests
• Managed configuration control & change processes
• Deficiency tracking & reporting

Transportable ground hardware stack.

Expert software capabilities and support.