



Hellenic Space Dawn

The HSD CubeSat mission is designed to validate Greek space technologies in orbit.

The mission is part of the **Greek National SmallSat Programme**, funded by the European Recovery and Resilience Facility (RRF) and managed by ESA on behalf of the Hellenic Ministry of Digital Governance.

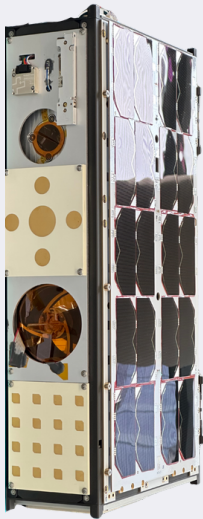
Greece 2.0
NATIONAL RECOVERY AND RESILIENCE PLAN

Funded by the
European Union
NextGenerationEU

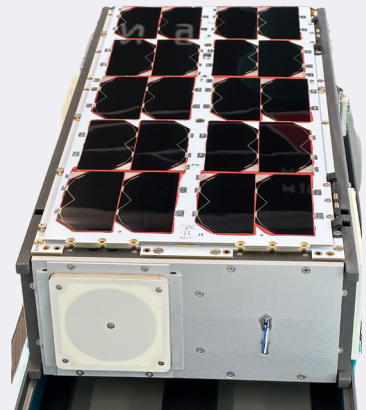
HELLENIC REPUBLIC
Ministry of Digital Governance

esa

Design Overview



- ✓ **2x 8U Structure**
Maximized payload volume.
- ✓ **ADCS Capability**
Guaranteed pointing accuracy.
- ✓ **Dual Communications**
RF and Optical links.
- ✓ **Payloads**
RGB Camera / RF ISL Transceiver
Optical Terminal /
Edge processing unit (HPDP)
HAMSL (Analog Mixed Signal Library)



Earth Observation Applications

- Ship detection
- Coastal and landslide monitoring
- Agriculture and forestry
- Light pollution
- Urban land use monitoring (urban changes, emergency mapping)

In Orbit Technology Validation

- **Dual Communications**
Testing high-speed laser links for satellite-to-ground downlinks.
RF Inter Satellite Link - Testing RF Communication between the two satellites for faster response.
- **On-Board Processing**
Validating next-generation on board Edge processing for real time image compression and data analysis directly on the satellite.

Emtech's Role

As the Prime Contractor, we manage the entire scope of the HSD mission.



Full Mission Leadership & Management

- Project Management and Quality Assurance Management.
- Leading a domestic network of five Greek SMEs and three academic institutions to build national capability.
- ITU filing and conflict resolution.
- Procurement of Service Module, Payloads and Ground Segment components.



Technical Design & Operations

- Designing the overall orbital parameters and constraints for the two 8U CubeSats (Helios and Selene).
- Developing the infrastructure needed to command the satellites and download payload data.



High-Fidelity Simulation & Risk Mitigation

- Building a **Holistic Simulator** modeling the entire mission lifecycle — from the Functional Engineering Simulator (FES) to the Software Validation Facility (SVF) and the Operational Simulator (OPSIM).
- Creating an **E2E Optical Simulator** that simulates the complete optical communication chain to deliver rigorous Bit Error Rate (BER) predictions.



Physical Performance Assurance

- **ADCS Testing:** Utilizing our in-house Helmholtz Coil Facility (magnetic cage and air-bearing structures) to simulate microgravity and orbital magnetic fields. This enables Hardware-in-the-Loop (HiL) testing to verify the sub-degree fine-pointing stability required for laser communications.

HSD Consortium

Integrated Systems Development (ISD S.A.)

- Handles the development of the payloads
- Supplies micro-electronic integrated circuits and high-performance EDGE processing modules
- On-Board Software Development
- Manages the crucial AIT/AIV activities.

HERON Engineering

Responsible for all mechanical engineering aspects.

LEO Photonics

Involved in the development of space optical communication systems.

Geosystems Hellas

Develops all Earth Observation applications and the Payload Data Ground Segment.

Aristotle University of Thessaloniki

Provides support in system simulations and expertise in CubeSat missions.

National Kapodistrian University of Athens

Supports high-performance on-board processing for image compression algorithms.

Hellenic Naval Academy

Contributes to the simulation of optical communication experiments.

