

MODELING & SIMULATION PLATFORM

Redwire's **Advanced Configurable Open-system Research Network (ACORN)** is a modeling and simulation development environment for space system design, integration, and test.

Using a Modular Open System Architecture (MOSA), ACORN offers a scalable, rapidly reconfigurable, closed-loop, end-to-end space system design ecosystem.

ACORN is a complete life-cycle digital engineering tool that provides for risk reduction and mitigation as well as increased mission assurance. The tool also enables significant cost reductions throughout the mission.

ACORN is available for export under the Export Administration Regulations (EAR) via the United States Department of Commerce under ECCN (Export Control Classification Number) 9D515 and 9E515.



APPLICATIONS

- + COTS component modeling
- + Custom component modeling
- + Design Reference Missions (DRMs)
- + Mission concept definition and review
- + Flight software development
- + Satellite component database integration
- + Software benchmarking and test
- + Subsystem/component trades and analyses
- + Spacecraft simulator
- + Hardware-in-the-Loop (HIL) emulator



MARKETS SERVED

- + Component Manufacturers
- + Commercial Suppliers
- + Constellation Developers
- + Payload Developers
- + Space Agencies and Government
- + Spacecraft Integrators
- + Space-enabled Data Analytics
- + Colleges and Universities



FEATURES

- + Dynamic modeling and simulation space environment via high fidelity physics and environment models
- + Design Reference Mission (DRM) focused Configuration GUI with user libraries that provide configuration management and the ability to clone components, spacecraft, and DRMs
- + Dynamic messaging system and built-in APIs allow models or segments of software to be exchanged for user-defined software
- + API for user customization, components integration, and custom models and flight software modes
- + Selection of pre-programmed generic subsystem and component models
- + Attitude determination and control flight software for use on modeled spacecraft
- + Command and control software for simulated pointing and tracking
- + Benchmarking tools and test metrics
- + Multiple physical interfaces supported: RS-422, I2C, MIL-STD-1553b, UART, SPI, SDIO, GPIO, Ethernet, Serial, etc.
- + Out-of-the-box flight scenarios
- + Spacecraft health and status, backplane, and ephemeris data logging
- + Vehicle to ground and vehicle to vehicle line of sight and range computations

CONTINUOUS, SCALABLE ACORN PLATFORM PROVIDES VALUE THROUGHOUT SYSTEM LIFE CYCLE

ACORN-VM/ACORN-S Software-in-the-Loop (SIL)



Unconstrained

- ConOps, DRMs
- FSW Development
- APIs for Third Party App Development

ACORN-R Processor-in-the-Loop (PIL)



First Order Constraints

- Processor Benchmarking utilizing BESSE
- IO External Hardware Interfaces
- Ground C2 Software

ACORN-MT Hardware-in-the-Loop (HIL)



Fully Constrained

- Full Modular, Reconfigurable Satellite Testbed
- Full Development, Integration, & Toolset
- Conduct DRM with HIL

For more information about our space capabilities, contact us at

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HERITAGE

Redwire is a new leader in mission critical space solutions and high reliability components for the next generation space economy. With decades of flight heritage combined with the agile and innovative culture of a commercial space platform, Redwire is uniquely positioned to assist its customers in solving the complex challenges of future space missions. For more information, please visit www.redwirespace.com.

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