United Electronic Industries / AMETEK

APPLICATION STORY

SIM.SPACE & UEI • Unified Digital Simulation and Dynamic HIL

WORKING TOGETHER TO BUILD THE FUTURE OF SPACE TEST SYSTEMS

Sim.Space is a cutting-edge simulation and testing company specializing in the development of dynamic digital environments for aerospace and defense applications. Their mission is to unify simulation, testing, and operational readiness through advanced digital twin technology and Hardware-in-the-Loop (HIL) systems.

To achieve this, Sim.Space developed the Hybrid Lab—a Unified Digital Simulation and Dynamic HIL environment that integrates Software-in-the-Loop (SIL), Model-in-the-Loop (MIL), and HIL testing. This infrastructure allows engineers and operators to work within a consistent simulation framework, reducing training overhead and increasing system reliability.

Sim.Space's needed a flexible and configurable I/O backbone for their HIL and digital twin systems to support real-time simulation and telemetry-driven updates.

UEI RACKtangles in Sim.Space Systems. Photo courtesy of Sim.Space.

THE IMMEDIATE CHALLENGES

1. A high-performance, modular HIL platform capable of interfacing with satellite subsystems and ground control hardware.
2. Real-time data acquisition (DAQ) and control to support dynamic simulation scenarios and digital twin updates.
3. Seamless integration of telemetry inputs for predictive maintenance and operational optimization.
4. A scalable system architecture that supports rapid prototyping and iterative testing across multiple mission profiles.

PATHWAYS TO SUCCESS

☑ Sim.Space selected UEI's 12-slot RACKtangle® chassis to serve as the core of their Hybrid Lab. The RACKtangle's extensive I/O options—including analog, digital, serial, and CAN interfaces—enabled Sim.Space to connect with a wide range of satellite components and ground systems.

UEI's 12-Slot RACKtangle I/O System

- [x] Using UEI's flexible API and real-time capabilities, Sim.Space was able to synchronize simulation scenarios across SIL, MIL, and HIL environments. This consistency allows engineers to validate designs using virtual prototypes and transition seamlessly to hardware testing without rewriting code or reconfiguring systems.

- [x] The digital twin infrastructure built on UEI hardware receives real-time telemetry updates, enabling predictive maintenance, battlefield optimization, and risk mitigation for satellite operations. UEI's rugged design and long-term availability guarantee ensure that Sim.Space's systems remain reliable and scalable for future missions.

END RESULT

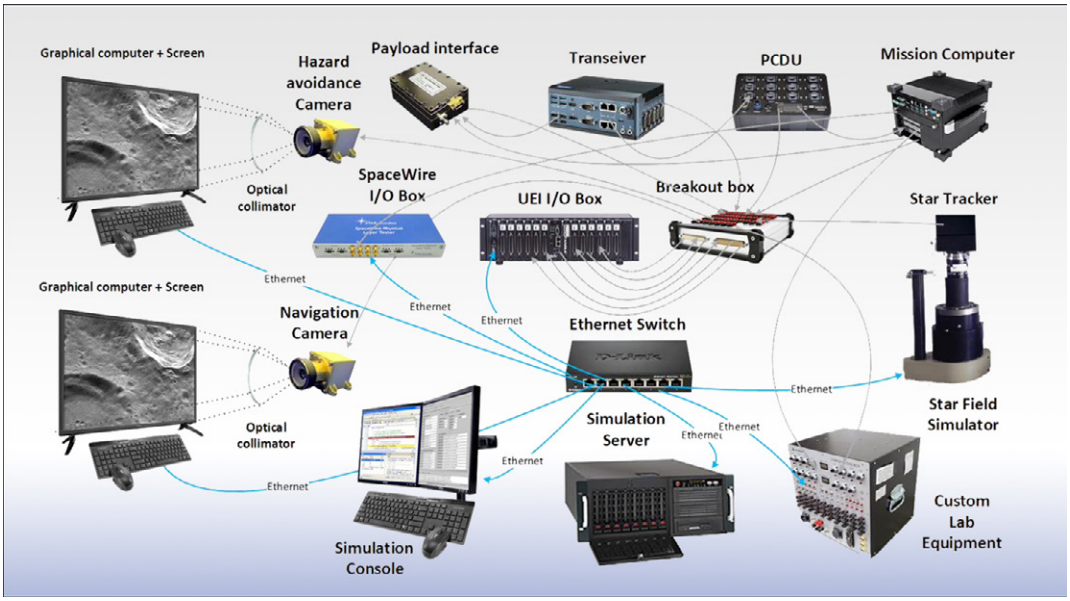
"WE AT SIM.SPACE HAVE BEEN INTEGRATING UEI EQUIPMENT IN MANY SUCCESSFUL HIL SIMULATIONS FOR ALMOST 10 YEARS NOW AND ARE VERY HAPPY WITH IT."

- ASAF LEWIN | FOUNDER AND CEO | SIM.SPACE

GREAT PARTNERSHIP. OUTSTANDING SOLUTIONS.

[WIN] Sim.Space's Hybrid Lab is now a cornerstone of their simulation and testing ecosystem, supporting satellite development, mission rehearsal, and operational training.

[WIN] With UEI's RACKtangle at the heart of the system, Sim.Space continues to push the boundaries of digital simulation and aerospace innovation.



Example of a Sim.Space HIL Hybrid Lab Topology.

Chart courtesy of Sim.Space.

[WIN] UEI's engineering support and versatile hardware platform have empowered Sim.Space to deliver a unified, dynamic simulation environment that meets the demands of modern aerospace systems.

ASK US HOW UEI CAN DO THE SAME FOR YOUR COMPANY!

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