

# COMPLETE, REALISTIC SIMULATION OF MISSION-QUALITY SCENARIOS

## Introduction

Reduce risks and ensure mission readiness with comprehensive simulation you can use throughout the entire life cycle of a mission. SimHub is a spacecraft and ground system simulator that enables high-fidelity, scalable simulation; realistic training; and the test and checkout of telemetry, tracking, and commanding (TT&C) systems. With a modular architecture, you can start small and add on, while testing and integrating each time changes are made. As an out-of-the-box solution, SimHub comes ready to test standard operational environments and makes it easy to plan complex scenarios. SimHub is the simulation you need for current and future real-world missions.

## Overview

SimHub is an open-architecture, commercial product offering a highly customizable, physics-based modeling framework used to support system design, development, integration, testing, training, and rehearsals. SimHub offers rapid deployment capabilities providing basic satellite command and telemetry within weeks, not months, enabling earlier development and continuous improvements of ground, bus, and payload systems. This capability is enabled by using command and measurement list (CML) ingestion tools that translate provider information into files, allowing SimHub to produce commutated telemetry streams and validate commanding without any updates to the underlying code. Subsystem models supplement “FlatSat” components, reducing the demand on scarce hardware resources during integration and test cycles. By integrating payload and bus flight software, it enables training of operators early in the life cycle and checkout of procedures before acceptance tests. A fully modeled spacecraft ensures readiness for rehearsal and training of mission scenarios by portraying both nominal and off-nominal conditions. SimHub scales as the system’s requirements scale—shortening deployment cycles, accelerating systems integration, and reducing development and operational risks.

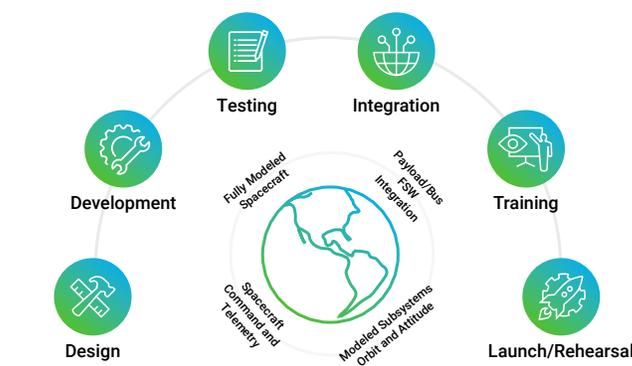
### Key Technical Features:

#### Highlights

- Scalable as mission requirements mature
- Early C2/bus/payload systems development, systems testing, and systems integration
- Early operations checkout and automation testing
- Early operations exercises and rehearsals

#### Benefits

- Facilitates rapid cycles versus waterfall deliveries
- Minimizes rework by finding defects earlier
- Shortens overall system deployment
- Reduces demand for scarce FlatSat resources
- Improves operational team performance
- Reduces mission-readiness risk



Let us help you simplify your next spacecraft/C2 deployment.

## Capabilities

### Simulation Control

Simulation control includes play, pause, and stop controls, as well as simulation duration and speed controls and simulation snapshot controls.

### Thread-Safe Data Sharing

Datanodes are the state data, which is persisted within the simulation, enabling thread-safe communication between models. They are defined for all common data types (int, real, string, arrays, etc.) and decouple direct model-to-model communications, enabling complex systems to be modeled.

### Models

C++ dynamic link libraries (.dlls) enable simulation developers to use predefined code templates to create all subsystems required for the simulation. Completed models determine the dynamics of how the associated datanodes interact, change, and report information to the simulation engine, creating a chain of events with other impacted models.

### Model Controls

These controls provide access to functionality, enabling users to insert parameters or change variables within the loaded models. They also display status back to the user about the underlying functionality within the models.

### Scripting

Cause-and-effect situations can be established for training and rehearsal through scripted state data changes at time-based intervals.

### Alerts, Warnings, Errors, And Out-Of-Limits

A continuous list of all datanodes currently out of the nominal limits are displayed. Limits are defined as green, yellow, or red and have a corresponding visual flag.

### Search Capability

Keyword searches that query the datanodes loaded within the workspaces are enabled. These also provide a visual representation of the value of the datanodes discovered.

### Widgets

These provide the capability to choose from a variety of indicators to graphically display and control datanode values. In addition, display widget styles are customizable. The user may then save customized settings as a style for future use.

### Supporting Functions

These provide system logging, user manager and system status, and real-time asset schedules.



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