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FLEX

Flight Software Framework

OVERVIEW

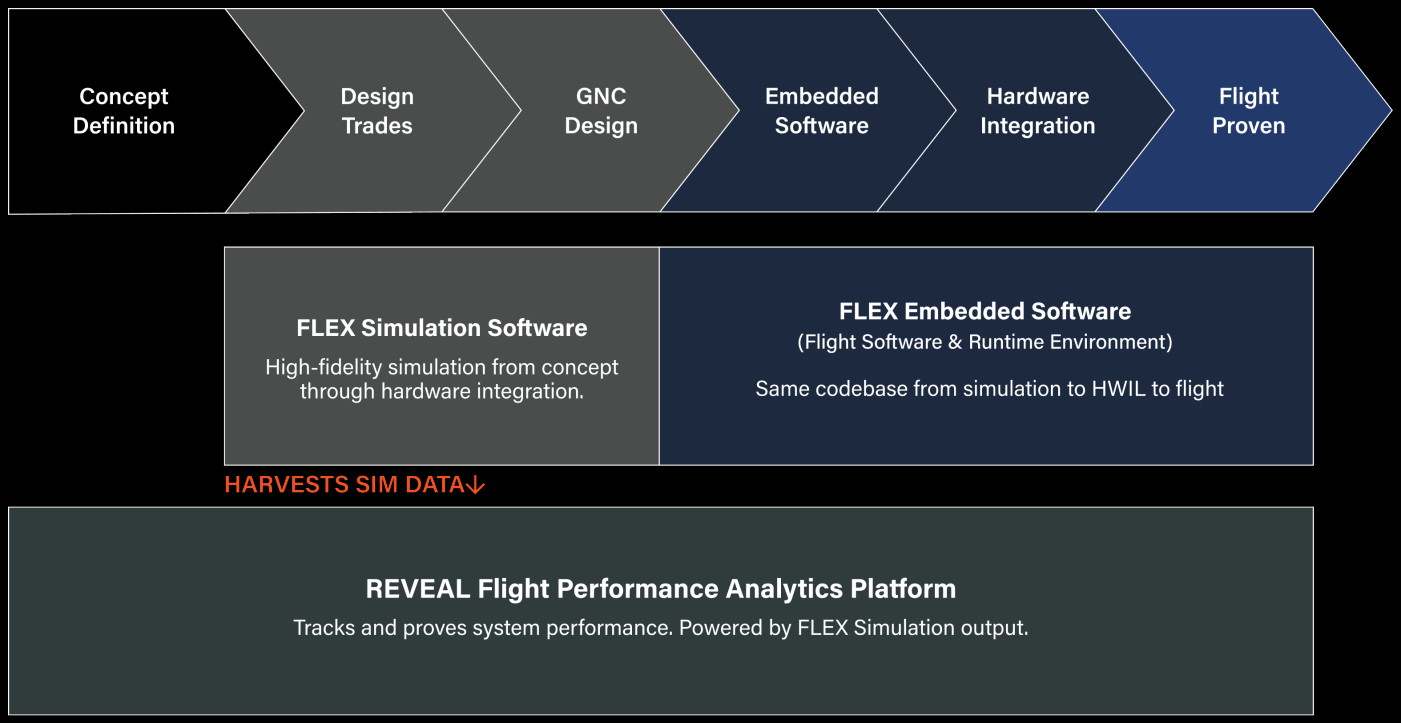
Most programs spend months building flight software infrastructure before writing a single line of guidance, navigation, and control (GNC) code. The FLEX framework provides a validated GNC foundation in a single codebase that runs in simulation, software-in-the-loop, hardware-in-the-loop, and flight. Integration risk surfaces early, when it is cheapest to fix, so programs reach first flight faster.

Key Features

01	One Codebase, Simulation to Flight	FLEX Simulation Software is built on the same FLEX Embedded runtime that flies the vehicle. A single codebase spans software-in-the-loop (SIL), hardware-in-the-loop (HWIL), and first flight, so integration problems appear in simulation instead of on the range.
02	High-Fidelity Simulation from Concept Forward	A 6-DOF model library spanning satellites, launch vehicles, missiles, hypersonics, and UAS supports SIL and HWIL testing early and often, backing design decisions with high-fidelity data from concept definition through hardware integration.
03	30,000 Simulation Hours a Night	REVEAL Performance Analytics harvests data from large-scale Monte Carlo runs and tracks key performance parameters, identifying performance gaps before SIL and HWIL, when they are cheapest to fix.
04	Built-In GPS-Denied Navigation	FLEX Embedded Software fuses data from the vehicle's native sensors through a multi-sensor Extended Kalman Filter (EKF), enabling navigation without GPS and without any external signal.
05	Deterministic and Processor-Agnostic	FLEX Embedded Software is hard real-time and MISRA-compliant, runs across customer-specified processors, and ships preinstalled on BRAIN flight computers.

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ScavengerNav GPS-Denied Navigation

Works with the FLEX framework to deliver positioning in Anti-Access/Area Denial (A2/AD) environments, day and night, without GPS or datalink.

APPLICATIONS

UAVs & CUAS Interceptors

Missiles & Hypersonics

Loitering Munitions

Spacecraft & Launch Systems

Avionics and software currently shipping to multiple defense and space customers and partners.

BUILT FOR

- GNC performance beyond what microcontroller-based architectures can deliver
- Autonomous operation requiring deterministic, verifiable flight control
- Aggressive development schedules with limited tolerance for integration risk
- GPS-denied or communications-degraded navigation
- Collaborative swarming with autonomous teaming algorithms alongside deterministic flight control



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GuideTech, LLC
Kansas City, KS | Tucson, AZ

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www.guide.tech
info@guide.tech
(1) 435-359-2440