S-PLANE

Simulation
Solutions

S-PLANE delivers high-performance and comprehensive system-wide Simulation Solutions to support system and subsystem development, integration, production, training, and maintenance. Typical functions include acceptance, verification and validation, qualification, and integration testing. Our Simulation Solutions include Software- and Hardware-In-the-Loop Simulation (SILS & HILS).

SILS is used for development and is also integral to S-PLANE's Ground Control Stations (GCS). In the GCS, SILS is used for training purposes and to allow operators to optimise and prepare and rehearse missions prior to execution.

HILS is an essential modern tool for system and sub-system development and for integration and testing of aircraft and their sub-systems. At S-PLANE, HILS supports automated execution of acceptance tests as part of an efficient system engineering tool chain.

Simulation

Solutions

XSIM-HILS

XSIM-HILS is an advanced and comprehensive system-wide hardware-in-the-loop simulator engineered to meet the increasing complexity and performance requirements of modern airborne mission and flight-critical systems. It combines modular hardware, high-performance simulation software and advanced processing power to create a real-time testing environment that accurately replicates real-world operating conditions, including system failure modes. XSIM-HILS supports up to four I/O expansion units, delivering unmatched I/O diversity and capacity. With three I/O configuration variants to choose from, the XSIM-HILS modular architecture integrates seamlessly into almost any simulation system.

XSIM-HILS Libraries

XSIM-HILS includes optional model libraries covering aircraft dynamics, sensors, actuators, propulsion systems, environmental effects and ISR mission payloads, enabling rapid builds of system and subsystem simulations. Users can also develop and integrate their own custom models, offering flexibility for specialised hardware, software, or mission-specific requirements.

XSIM-Workbench

XSIM-Workbench is an application which allows users to develop and operate simulations. Operators can control, monitor performance in real time, trigger events, and download log data after execution. They can simulate various operational scenarios including environmental disturbances and failure modes and conditions. These events can be scripted or triggered live during simulations to evaluate system responses under challenging conditions. XSIM-Workbench also allows users to create and deploy new or updated Simulation Packages to HILS target hardware.

XSIM-Video

SIM-Video is a real-time video simulation appliance that generates and displays simulated video feeds. It receives data from a simulated aircraft and camera payload, creates a visual representation of their operation in a virtual world, and outputs high-quality, low-latency HD-SDI and composite video. This enables users to perform flight tests, train operators and allows for integration testing, in a simulated environment before physical hardware is available.

XSIM-ITS

The HILS Integrated Test Station (ITS) connects integrated aircraft to a HILS in order to put them through their paces without leaving the ground. The ITS is a rugged, transportable 19-inch rack-based unit allowing system integrators to perform detailed HILS during initial, production and post-maintenance integration phases. It is used to power critical aircraft sub-systems, integrates those sub-systems into a simulation environment and provides break-out connections to essential system ports to verify that those critical sub-systems are functioning properly (per specified acceptance test procedures).

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X-KIT Key Equipment

X-CUBE

- The X-CUBE is the core avionics unit of the X-KIT for UAS/OPS conversion
- Function: Flight Control Unit (FCU), Power Distribution Unit (PDU) and Input/Output (I/O) Concentrator
- Support SCP, DFR and TFR internal redundancy with dedicated voting
- Further supports dual X-CUBE external redundancy with failover architecture

X-ADT

- Airborne Data Terminal (ADT)
- Function: Mission Computer, I/O Concentrator, HD-SDI Video Encoder, Data Storage, Ethernet Switch
- Supports S-PLANE's mission software and third-party or custom containerised software
- Interfaces with and manages and controls mission payloads (RADAR, EO/IR, SIGINT, AIS and Direction Finder)

X-RPU

- Remote Piloting Unit (RPU)
- Function: Safety-critical Command & Control Computer, and I/O Concentrator
- Interfaces to Primary Flight Controls (PFC), GCC MFD, Hard I/O (buttons and switches with parallel redundancy) and to data links/tracker

TRACKER+

- Stand-alone GNSS-based antenna tracker for UHF, L-, S- and C-bands
- Function: Long-range Line of Sight Communication (LOSCom) between aircraft and Ground Control Stations (GCS)
- Mesh network enabled

GCC and Paragon

- Ground Control Console (GCC)
- Configured as a Remote Piloting Station, Payload Operating Station, or Engineering Station
- Function: HMI for Paragon, PFD with HUD, and MFD (touch display) for Remote Piloting

Equipment Chains & Products

	AIRBORNE CONTROL	GROUND CONTROL	COMMUNICATION	SIMULATION
NX-FCU	Automation & ISR Mission		Automation & ISR Mission	
X-CUBE	Automation		Automation	
X-ADT	ISR Mission		ISR Mission	
X-RPU		Automation		
GCC		Automation & ISR Mission		
Paragon	Automation & ISR Mission			
X-GDT		ISR Mission	Automation & ISR Mission	
TRACKER+			Automation & ISR Mission	
XSIM-HILS				Automation & ISR Mission
XSIM-Workbench				Automation & ISR Mission
XSIM-Video				Automation & ISR Mission

Contact Details: 9B Cyclonite Road, The Interchange, Somerset West, South Africa, 7130 • Phone: +27 21 851 9282, Fax: +27 86 298 4587, Email: info@s-plane.com

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