BLOOMY®

Automated test solutions for the entire product lifecycle

eVTOL Integrated HIL Test System

Real-time hardware in-the-loop (HIL) test of flight control systems and energy management for eVTOL aircraft

The eVTOL Integrated HIL Test System provides an integrated, closed-loop test environment for dynamic testing of flight control systems and battery management systems for electric aircraft. The system simulates both batteries as well as any control surface activities which may occur during forward flight as well as during transitional flight. The eVTOL Integrated HIL Test System delivers repeatable, cost-effective testing in a fraction of the time needed to create bespoke, custom in-house simulation systems.

BLOOMY®'s premier battery simulator, the 12-cell Battery Simulator 1201, is used in conjunction with industry-standard components from NI, Virginia Panel Corporation, BLOOMY, and others. Control of the simulations of the aircraft, control surfaces, and the batteries is performed using one common test executive to simplify implementation of System Integration Labs (SILs). Scripted tests created using COTS scripting languages ensure that testing is repeatable and efficient.

APPLICATIONS

- System Integration Labs (SILs)
- Development of control laws prior to physical test
- Development, production, or maintenance test
- Environmental Stress Screening (ESS)/Highly Accelerated Life Testing (HALT)

FEATURES

- World-class battery simulation for battery management system test
- Simulation environment for comprehensive flight control system test
- Analog I/O including thermistors, RTDs
- Actuator loads including inductive solenoids, torque motors, and indicators
- Discrete switch signals such as open/ground, open/Vcc, open/closed
- Digital communications including ARINC-429, MIL-STD-1553B, serial
- Simulation-controlled variable DC power supplies and 1Ø/3Ø AC supplies
- ThroughPoint™ Interface Panels with integrated breakout box functionality

SPECIFICATIONS

AVAILABLE SIGNAL CONDITIONING AND COMMUNICATION I/O	
Interface Type	
VDT/Resolver simulation (4W, 5W, 6W)*	RS-422
Thermocouple simulation*	ARINC-429
Thermistor simulation	MIL-STD-1553B
Strain Gauge simulation	IRIG B
Loads (torque motors, solenoid, lamp, etc.)*	Ethernet Test Bus
Discretes (one-wire and two-wire)	DC Power
Differential analog outputs to UUT	AC Power
Potentiometer/variable resistor simulation	
FAULT INSERTION	
*Open circuit fault included.	
Other fault conditions (short to ground, pin to pin short, etc.) optional for all signal types	

BATTERY SIMULATION

CELL CHANNEL SIMULATION	
Simulator Type	Battery Simulator 1201
Number of Channels	12
Channel Type	Sink and Source
Voltage Range	0.0 to 5.0V
Voltage Resolution	0.1mV
Voltage Accuracy (requires remote sense)	±1mV
Current Range	±500.0mA (output derates linearly under 2V)
Current Resolution	0.1mA
Current Accuracy	±1mA
Current Limiting Accuracy	±10mA
Isolation	1000V double/reinforced
CHANNEL READBACK	
Voltage Resolution	0.1mV
Voltage Accuracy	±1mV
Current Resolution	0.1mA
Current Accuracy	±1mA
DIGITAL I/O	
Channels	8 (bidirectional)
Logic Level	3.3V

GENERAL

COMPUTING RESOURCES	
Real-Time Simulation Host	PXIe-based, RTOS, up to 8-Core Xeon
Instrumentation and System Management	PXIe-based, Windows, up to 8-Core Xeon
SOFTWARE ENVIRONMENTS	
Real-time Framework	NI VeriStand
Test Executive	NI TestStand, Python
Data Acquisition and Programming	NI LabVIEW, C/C++
Data Management and Analysis	NI DIAdem
Supported Software Models	C/C++, Simulink, LabVIEW
SYSTEM DIMENSIONS AND POWER	
System Chassis	1- or 2-bay 40U equipment racks
1-bay:	approx. 78”H (w/locking castors) x 23”W x 36”D
2-bay:	approx. 78”H (w/locking castors) x 46”W x 36”D
Weight	Configuration dependent
Power Requirements	Power requirements vary with selected AC and DC power supply options
Emergency Power Off	Standard
Uninterruptible Power Source	Standard for all computing resources
WARRANTY	
1-year warranty on all hardware components, optional extended warranties available	

Call 860-298-9925 or visit
www.bloomy.com

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