Virtualization of CONOPS integrated HIL testing for aerospace applications

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Abstract:

Aerospace Systems are becoming increasingly software defined. Resulting explosion of embedded software presents new challenges for system designers due to increase number of test scenarios. Product design teams are increasingly moving towards connecting physics driven modeling and simulation approach with data driven test and validation practices. This method allows modeling operational environments and the interrelationships of assets with accurate, dynamic, physics-based simulations to validate system designs under MiL and HiL environment with respect to the mission's outcome.

With hardware-in-the-loop (HIL) simulation testing, engineers test critical components like electronic control units (ECUs) and line-replaceable units (LRUs), running these components through complex scenarios. A traditional approach of uses ideal or analytical link budget parameters in ECU/LRU testing. A physics derived accurate Link Budget parameter that considers operational awareness of all critical parameters through Digital Mission Engineering ensure very accurate validation of ECU testing.

Open Loop / Closed Loop STK Integration with NI PXI