



DISTRIBUTED LXI MEASUREMENT SYSTEM SIMPLIFIES AIRCRAFT STRUCTURAL TESTS.

Background

Designing a fatigue test system for an aircraft wing requires a significant engineering investment. The set-up can involve 5000 to 6000 channels of strain gage transducers that must be located at strategic points on the structure. The cost of installing the cables for such a test can be significant because nearly 40,000 connections (eight-wire configuration) must be properly identified, cataloged, attached and tested.

In addition, the test must be performed a considerable distance from the control room; therefore, the system must compensate for measurement errors due to cable loss and noise pickup. To compensate for these effects, test installations typically implement proprietary calibration sequences and correction factors.

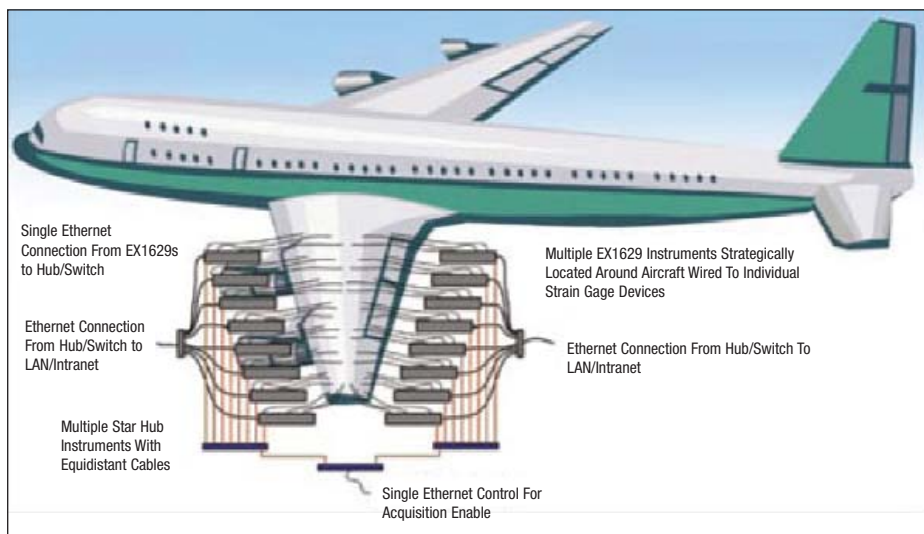
Maintenance and support also are factors because tests of this nature typically span long time periods and are susceptible to errors due to fatigue and accidents. The effects of most of these factors are greatly reduced by placing the instrumentation as near to the test article as possible by implementing a solution based on LXI (LAN eXtensions for Instrumentation).

LXI Solution

Distributed LXI-based instrumentation such as VXI Technology's EX1629, a 48-channel high-performance remote strain measurement unit, greatly simplify the task. Each EX1629 can be placed near the test structure and connected to the test LAN using standard Ethernet cable and networking accessories. The simpler cabling and installation decrease both set-up time and cost.



Aircraft Structural Test Set-up



Highly integrated instrumentation of this type also improves accuracy by incorporating all signal conditioning and excitation sources in a single package. Separate analog excitation sources provide programmable bridge excitation voltages near the test structure, and independent ADCs monitor the voltage applied to the strain gage. The instrument integrates extensive signal conditioning and filtering along with comprehensive self-calibration to further improve system accuracy and reduce test set-up times. Once all the LXI instruments are connected to the dedicated test LAN, a single Ethernet cable can be routed to the control room for data collection and control.

About LXI and the LXI Consortium

LXI is the LAN-based successor to GPIB. The LXI standard goes beyond GPIB to provide additional capabilities that reduce the time it takes to set up, configure and debug test systems by connecting directly to the standard ports on a PC. It also removes the inherent cable length limitations of GPIB. Also, LXI software and drivers simplify test system set-up. LXI also helps integrators leverage the time and effort already invested in system software and architecture.

The standard is managed by the LXI Consortium, a not-for-profit corporation comprised of leading test and measurement companies. The group's goals are to develop, support and promote the LXI standard. LXI's flexible packaging, high-speed I/O, and prolific use of LAN address a broad range of commercial, industrial, aerospace and military applications. Additional information about LXI-compliant products as well as licensing, specifications and consortium membership is available at www.lxistandard.org.



LAN eXtensions for Instrumentation

The Successor to GPIB.

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+1 303-652-2571