

MINIATURE DAQ FOR FLIGHT TESTING

The latest data acquisition units are delivering custom capabilities with commercial off the shelf accessibility

// KAREN DANIELS



Rapidly advancing technology is at the forefront of many aerospace and defense programs. One critical challenge has been the capability to test these evolving technologies quickly and cost-effectively. Hypersonic armaments, rapid advancements in drone technologies and rotorcraft developments such as eVTOL are just a few examples that push current testing capabilities.

Each new platform, material, or flight capability requires validation. This creates engineering challenges at a component level, as well as for the overall structure, to ensure integrity, efficacy and safety. Once simulation testing is complete and physical testing has begun test engineers look for data acquisition systems that can provide

accurate measurements in-situ. The latest smaller, faster and higher-flying aircraft have to be developed within extremely strict time, cost, and performance parameters. Additionally, harsh test environments require data acquisition technology that can keep pace over land and sea.

These demands have driven the need for versatile, ever-smaller, more cost-effective data acquisition units (DAU). Diversified Technical Systems (DTS) is meeting those needs with game-changers such as the SLICE6 AIR miniature COTS data acquisition unit.

Huy Nguyen, aerospace and defense sales manager at DTS explains, "We are at a point where everything is getting

smaller, cheaper, and lighter. The pace of development is so fast and demands so restrictive, that today's data acquisition units must be small enough, rugged enough, and versatile enough to work with all these new platforms. The capacity to accurately measure variables in such a broad range of technologies is part of what makes SLICE6 AIR so unique."

FEATURE-RICH AND SMALL

Fully optimized for low size, weight and power (SWaP), SLICE6 AIR features universal sensor support to collect a wide range of analog signals including shock, vibration, temperature, and voltage. The rugged enclosure measures a mere 42 x 42 x 13mm in size so it can be embedded near points of interest that were previously inaccessible due to limited space and without altering test dynamics. It also supports both real-time streaming in IRIG-106 (CH10 or TmNS) and has 16GB memory for store-in-place recording.

But it's not just size and versatility that matter. "The ability to cost-effectively test new systems and platforms is paramount to the continued growth and success of these developing technologies. The fact that SLICE6 AIR is COTS helps," continues Huy. "Time is always a critical cost factor. Lead times matter, test set-up time matters, and engineers often have limited time to access the test vehicle."

SLICE6 AIR also offers flexibility because it can be used standalone, networked, or integrated into existing Ethernet-based FTI. For captive carry applications it can even be integrated on the test article before installation onboard the flight vehicle.

Beyond the miniature size and ruggedness, the SLICE6 AIR has numerous features that make it well suited for aerospace testing. The six-channel modules can quickly expand to support up to hundreds of channels. SLICE6 AIR supports variable sampling rates for long duration or high-rate short duration testing, and it is MIL-STD-810G rated for temperature, altitude, shock, and vibration.

The SLICE6 AIR is an easy deployable data acquisition solution to support modification or compatibility testing, and the success of this unit is exemplified by the broad range of applications for which it's currently being used. In everything from destructive testing to UAVs/drones, ejection seats, space capsules, and fixed or rotary wing testing, the SLICE6 AIR is expanding test possibilities. As a closer look example, the unit's ultra-small size allows it to be installed directly on rotors near the sensors. The built-in signal conditioning eliminates the need for running analog sensors through slip rings,

1 \ \ SLICE6 AIR data acquisition units are optimized for size, weight and power (SWaP). In addition to 16 GB memory for onboard recording, SLICE6 AIR also supports real-time streaming in IRIG-106 (CH10 or TmNS)

"TODAY'S DATA ACQUISITION UNITS MUST BE SMALL, RUGGED AND VERSATILE"



2



3

thereby eliminating noise and reducing cost and time; all factors common in rotating measurements. Huy adds, "Successful testing requires more than just a really good data acquisition unit. It's important to have something that is usable off the shelf which can be adapted to many scenarios. What's unique about SLICE6 AIR is that it doesn't require customization or multiple vendor components. That's also important when it comes to cost and lead time."

A DYNAMIC HISTORY

Access to the latest technology is necessary to support both current and future development projects. Without the best tools, the ability to innovate and develop more advanced technology can be compromised. DTS developed the SLICE6 AIR based on their SLICE6 data acquisition system. Jim Shaw, DTS director of sales and marketing, who has an extensive background in aerospace comments, "Our SLICE6 unit was created for the US Army

vertical load blast manikin. When aerospace and defense agencies took notice, we realized that an airborne version was needed - and the SLICE6 AIR was born."

DTS explains that its job is to provide engineers with innovative test and measurement solutions that help redefine state-of-the-art. Jim sums it up by saying, "SLICE6 AIR allows customers to push the limits of what is possible in testing."

Karen Daniels is a freelance writer for DTS

2 \ The 6-channel module works standalone, an IEEE 1588 compliant Ethernet switch allows PTPv2 daisy-chaining for higher channel counts

3 \ Each miniature SLICE6 AIR data acquisition unit includes a microprocessor, excitation, signal conditioning and universal sensor support for full and half-bridge



SLICE6 AIR
 Shown Actual Size
 42 x 42 x 13 mm
 50 grams



SWaP-optimized SLICE6 AIR data acquisition units deliver custom capabilities with COTS accessibility. Designed to collect analog sensor data on test articles with size and mass constraints, the rugged miniature SLICE6 AIR is taking flight testing to new heights.

Fixed Wing / UAV / eVTOL / Rotorcraft / Ordnance / Launch Vehicles

DTS
 www.dtsweb.com

© 2020 DTS