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Weight Optimization Using Lightweight Data Acquisition Nodes

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Instrumenting an aircraft for applications such as Health and Usage Monitoring (HUMS) or Operational Loads Monitoring (OLM) requires the installation of a significant number of sensors to measure vibration and/or strain. The data from these sensors must be gathered to a single point i.e. the LRU that is performing the core function of the HUMS or OLM application. This requires cables, typically shielded twisted pairs that can contribute a significant amount of weight to the aircraft. This weight gain is undesirable, particularly for small vehicles such as UAV's and rotorcraft. In this paper ACRA CONTROL introduces a small; lightweight Remote Data Acquisition Unit (RDAU) that provides interfaces to the common sensor types for HUMS and OLM applications. It performs synchronous sampling, and transports the acquired data over Ethernet to the line replaceable unit (LRU) performing the core function of the application. Example applications and installations will also be comparatively analyzed to highlight the opportunity to achieve weight savings through the use of an RDAU for the remote aggregation and transport of data.

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Ключевые слова:

Содержание

Abstract
Introduction
Weight reduction
Installation gains
Ethernet
Conclusion