



# Helitune

Engineering Rotortuner Solutions

General System Data Sheet

## Rotortuner DASU™

High-performance HUMS Data Acquisition and Storage Unit

**Designed by Aircraft Engineers for Aircraft Engineers**

### Introduction

The Rotortuner Data Acquisition and Storage Unit (RT-DASU™) combines continuous vibration acquisition for up to 64 channels and measurements from multiple digital interfaces, providing an all encompassing HUMS solution for medium and heavy lift helicopters. Uniquely RT-DASU is a key component of the ZF Luftfahrttechnik (ZFL) In-Flight Tuning (IFT) solution.

This ground up product development combines latest technologies to produce a highly flexible and modular architecture, ideally suited for new applications as well as addressing third party HUMS component obsolescence.

### Product Overview

RT-DASU is a permanent fit HUMS solution for helicopters. The self contained unit, interfaces with multiple sensor inputs ranging from oil temperature pickups to high frequency vibration transducers. Flexible build options are available from 16 to 64 analogue input channels. Digital interfaces are also provided to record parameters from data buses such as MIL-STD-1553 and ARINC-429.

Traditional HUMS systems are held back by their inability to capture data from all measurement sensors at once. RT-DASU pioneers a new architecture that measures all sensor data in parallel utilising high speed 24-Bit technology. Conventional HUMS acquisition regimes wait until the helicopter is flying at a particular speed before taking a measurement. Helitune and the University of Bristol have identified that valuable data is being lost. RT-DASU directly addresses this problem with the continuous acquisition of all vibration data, allowing operators for the first time an opportunity to gain a true picture of aircraft health.

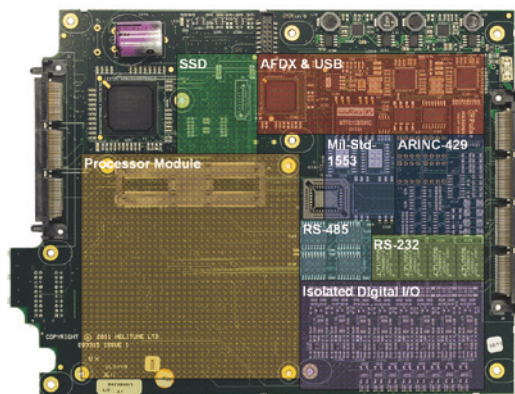
Additionally RT-DASU has been developed to meet the rigorous requirements of DO-160G, DO-178 / 254 (level D) and MIL-704 compliance.



RT-DASU

### Features and Benefits

- Rotor Track and Balance (RTB).
- Vibration Health Monitoring.
- Gearbox, Bearing and Engine diagnostics.
- In-Flight Tuning (IFT) capability.
- Continuous Vibration Acquisition.
- Aircraft and Engine Usage Monitoring.
- 24-bit measurement resolution.
- Advanced RTB solutions featuring MFR™
- Integration with Helitune's RT-Vision database.
- Simultaneous monitoring saves time reduces maintenance & operating costs, cuts carbon footprint and improves availability.
- Environmental qualification to DO-160G.
- Civil Aviation Authority CAP-753 compliant.
- Hardware/Firmware compliance to DO-178 / DO-254 level D.



RT-DASU Digital I/O

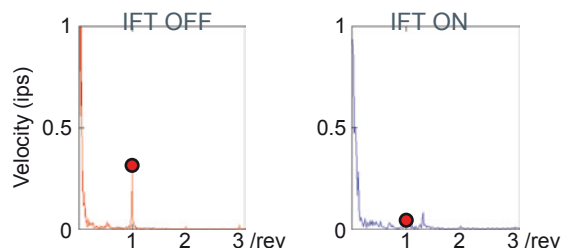
## Technical Specification

Accelerometers	16 (64)	Helitune Flitepad® Interface	Yes
Speed Sensors	4 (16)	Wireless (802.1)	Optional
Trackers	2	Internal Storage	32GB (Solid-state)
Digital Communications:		Dimensions (L x W x H) (mm)	250x180x50 (125)
USB	Yes	Weight	2 (3.5) kg
Ethernet	Yes	Environmental:	
RS232 / 422 / 485	Yes	Temperature	-30 to +70 Deg C
ARINC 429	Optional	DO-160G	Yes
MIL-STD-1553	Optional	Software (DO-178B)	Level D
In-flight Tuning Interface	Yes	Hardware (DO-254)	Level D

## Case Study : In-Flight Tuning Application

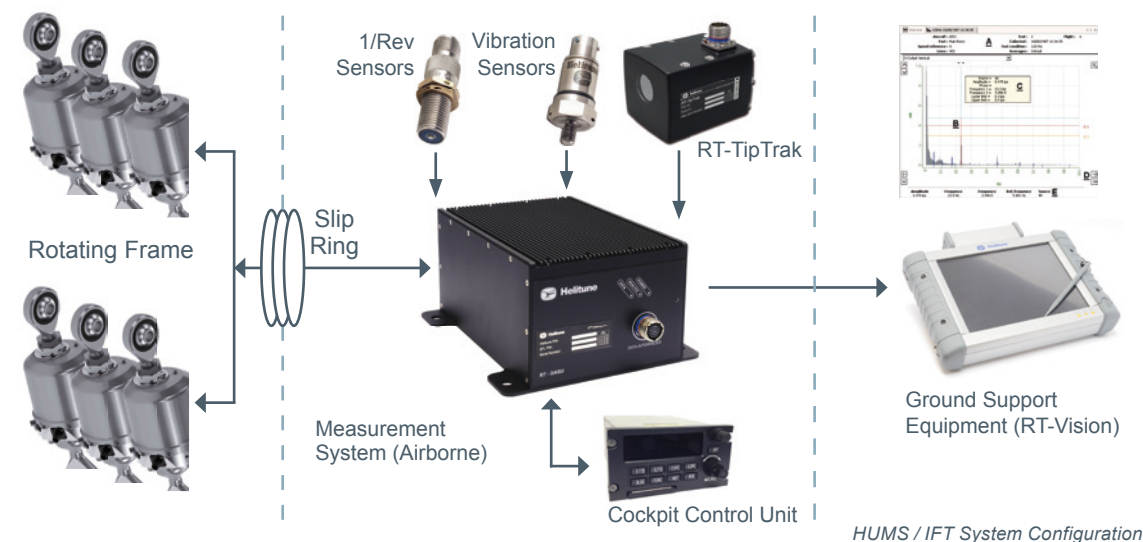
Imagine a time where a helicopter rotor can automatically adapt In-Flight to reduce vibration. That time has arrived with the collaborative development of the ZFL In-Flight Tuning (IFT) system. ZFL have produced a Smart Pitch Rod (SPR®) that is able to change its length in-flight, constantly tuning Rotor Track & Balance (RTB).

The Helitune RT-DASU, RT-TipTrak™ and RT-Vision™ ground station are key components of the IFT system. The RT-DASU as well as performing its HUMS duties, commands the Smart Pitch Rods to change length. Algorithms running in RT-DASU continuously process vibration and track data to optimise RTB, utilising Helitune's Minimum Flight Routine (MFR) solution.



Spectra from wind tunnel test by courtesy of ZFL

The Helitune and ZFL combined technologies deliver a unique aviation industry solution whose benefits include increased accuracy, reliability and safety, greater availability of aircraft and improved operator intelligence; resulting in enhanced helicopter performance and reduced operating costs.



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Helitune's Quality Management System is certified to BS EN ISO9001:2008 and AS9100

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PB-3314-01 Issue 1  
A4

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