

**Honeywell**

# **VIBRATION MONITORING/ HUMS DATA ANALYSIS SERVICES**

Provides Honeywell's engineering services  
and analysis tools



# Data Analysis

Honeywell has a series of software products and services to meet the various user needs – whether it is the maintenance technician at the aircraft reviewing data just collected on a flight, the quality manager reviewing the performance of an aircraft over time, or the vibration monitoring VM/HUMS manager responsible for an entire fleet of aircraft.

**Honeywell's HUMS products are focused on the collection, processing, and interpretation of data generated by the various components within an aircraft's drive train, engines, gearboxes, shafts, fans, rotor systems and other dynamic components. In all cases, vibration data can be viewed in the field at the platform, within the test cell or any other user/operator locations. With Honeywell's data services, a more detailed analysis can be performed by any skilled technician with access to a computer. This will allow for improved aircraft readiness, better maintenance decisions, and safer operations.**

## Server-Based Software Tools

Honeywell provides ground-based software tools for the end user to review aircraft condition and health status, review trending and perform analysis to generate maintenance actions.

Honeywell's tools provide a robust web-based file server for the analysis of user data and integrating into a Safety Management System (SMS). Data downloaded from the aircraft is uploaded to the Honeywell server, and backed up. The server allows the user access to all their aircraft data from anywhere in the world, and is protected such that only the user or their authorized representatives can access the data files. This allows a user to perform trending and/or prognostics by forecasting impending problems.

Preventative maintenance can be identified by automatically screening data to detect events or faults, reducing unplanned maintenance and operating costs.

Honeywell software tools were built for rotor smoothing, vibration diagnostics, and engine health monitoring. Fault specific Condition Indicators (CIs) are calculated and displayed from basic exceedances to complicated Gear and Bearing algorithms that use data fusion and neural networks.

## Honeywell Professional Services

For an annual fee, Honeywell provides server access and engineering data services to the users and operators of our VM/HUMS equipment. Services vary from providing server access for storing and backup of collected data, to full engineering data analysis and reports. Honeywell provides the user with logistics and maintenance analysis, fleet management, technical support, remote monitoring and fleet-wide monitoring.

Honeywell software tools enable a higher level analysis for earlier detection of faults and better maintenance.

### KEY BENEFITS



#### ENHANCES SAFETY

A proactive approach minimizes accidents before they happen. Data signaling potential problems on one aircraft can be used to comprehensively analyze an entire fleet.



#### INCREASES AVAILABILITY

Better maintenance planning means less unplanned downtime, faster turnaround and increased mission readiness



#### REDUCES COSTS

Our tools and services substantially cut maintenance/operating costs in the near term and over the life cycle of the aircraft and avoid costs of spares usage, dedicated test flights and asset recapitalization.



## Tier 1 – Software Tools

Software Tools provide the user with the ability to access Honeywell's web-based server and the data analysis tools allowing the user to upload and store data downloaded from the aircraft, and perform basic data analysis. Software Tools also provide the ability to modify the data collection specifications, create aircraft specific thresholds, customize reports, create diagnostics, generate email alerts, and generate maintenance procedures for use at remote sites.

Engineering Services can be purchased on a per hour basis to support the advanced user (Minimums apply).

## Tier 2 – Honeywell Professional Services

Includes Tier 1 Software Tools plus Honeywell data analysis, including reports to the customer regarding data collected, validation of system operation, anomalies, exceedances and thresholds. Honeywell engineering will perform all of the data analysis and report generation for the user. For the basic set of thresholds and limits that are not available in the Aircraft Maintenance Manual, Honeywell will review the data, collected by user relating to the same type, model and series aircraft, to identify possible additional component thresholds and limits.

Alerts and alarms validation will include validating system operation and exceedances events. The alarms will be analyzed and compiled into False Alarms and Case Studies of Success.

## Honeywell software tools enable a higher level analysis for earlier detection of faults and better maintenance.

The Alarm Analysis will be used to develop updated thresholds and limits.

Advanced Anomaly Detection (AAD) – AAD is included for Tier 2 operators with specific onboard HUMS equipment. The software program uses groups of condition indicators (CIs) to detect abnormal conditions using neural nets which approximate the distribution of CIs. When these are outside of the distribution, they may signal a fault, even if the CI is within its limit (below threshold). The user selects fault and the CIs (maximum of six) and the software generates and displays a scatter plot for each of the CIs based on distribution. The software will also display Asynchronous Frequency Domain or Synchronous Time Averages spectrum plots.

## Data Analysis Services

Honeywell provides data analysis services to the users and operators of our VM/HUMS equipment. Services vary from providing engineering hours to answer questions, to storing and backup of collected data, to full data analysis and reports. Honeywell provides the user with logistics and maintenance analysis, fleet management, technical support, remote monitoring and fleet-wide monitoring.

## Customer Support

Honeywell is dedicated to supporting our customers' needs. Our worldwide customer service is available via phone, fax or e-mail. We can help your organization improve skills in component balancing, engine testing, rotor smoothing, troubleshooting, and data management.

Training courses are provided for all products at the user level and advanced fleet administration/analyst level. Of course, service includes equipment repairs and calibration, for which we have expert in-house teams. Honeywell International representatives support over 180 countries.

### Find out more

Visit us online at: [aerospace.honeywell.com/HUMS](http://aerospace.honeywell.com/HUMS)  
or contact us at the following email address:  
[hums@honeywell.com](mailto:hums@honeywell.com)

### Honeywell Aerospace

1944 East Sky Harbor Circle  
Phoenix, AZ 85034  
[aerospace.honeywell.com](http://aerospace.honeywell.com)

N61-1538-000-000 | 06/16  
© 2016 Honeywell International Inc.

**Honeywell**