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A WORLDWIDE LEADER IN PRECISION MEASUREMENT SOLUTIONS

PBS-4100+

The latest evolution
in aircraft engine maintenance



The latest evolution in aircraft engine maintenance

The 4th generation of the PBS-4100+ sets the standard in turbine engine vibration analysis and balancing. Using the latest technology, the 4th generation PBS-4100+ continues to build on the field proven 35-year legacy of the industry's leading vibration analysis and balancing tool.

Small, lightweight, fast working and ruggedly built, the 4th generation PBS-4100+ is a truly portable solution contained in a new, high-visibility case. To further support mobile operations, the 4th generation features battery power that can provide up to 4 hours of continuous use on a single charge.





4100+ sets the standard in turbine engine vibration analysis and balancing

If you have worked with earlier models of the PBS family, you will recognize the same familiar, expert functions and workflow for vibration diagnostics, surveys, balancing, and maintaining historical engine data. The 4th generation unit is completely compatible with earlier PBS systems.

With traditional methods, it can take multiple time and fuel consuming engine runs to determine an approximate balance solution. Other "automated" balancing systems require you to manually enter readings or to guess which specific balance weights to use. The PBS-4100+ system is the only system that automatically collects and stores vibration data for future reference, calculates precise balance solutions, and determines the specific balance weights and balance weight locations – sometimes in as little as a "single shot" using the built-in influence coefficient method. Fuel and time savings over conventional balance methods can be up to 80%!

The associated WinPBS software provides intuitive and easy-to-interpret balancing solution diagrams that directly indicate to the user what balance weights are required, and where they are required.

Balance solutions developed by the PBS system can be more accurate than can be consistently obtained using traditional methods. In fact, the balance solutions developed by the PBS-4100+ improve its ability to develop future balance results. Influence coefficients developed from each run are successively integrated into future balances to obtain the most accurate solution possible in the least amount of time.

PBS-4100+ new features

Portability

- Battery-powered Data Acquisition Unit – up to 4 hrs of battery operation.
- Lighter, rugged and more compact 2-in-1 laptop with clam shell and tablet support.

Expanded Functionality

- 3rd tachometer input added to support three-spool engines and geared-reduction fans.
- Frequency range extended to 25 kHz, to support turboshaft and APU testing.

Usability Enhancements

- Streamlined vibration survey and balancing processes.
- Never worry about misconfiguring engine parameters again with new engine backup & restore capability.
- Quickly confirm that cables and Data Acquisition Unit are functioning properly with new Cable Check function.

Familiar Functionality

- Many WinPBS functions have been updated based on user feedback.
- Workflows remain unchanged, facilitating smooth migration from previous PBS models.

What the PBS-4100+ does

Vibration Surveys

Quickly assess the current condition of your engine by using the WinPBS vibration survey functionality. A variety of intuitive and informative display formats provide PBS users a wealth of information that can be viewed in real time, or after the fact in the system Data Viewer.

"One-Shot" Trim Balancing

Gone are the days of multiple engine runs, polar graphs, and handwritten solutions! The PBS can quickly characterize the rotors in your engine, allowing for highly accurate single run balance solutions. Automated reports are generated providing users a clear picture of how well balanced the engine is.

Trim Balancing using Trial Weights

Fine tune your PBS' characterization of the engine using trial weight balances to develop "influence coefficients" that can be utilized for quicker future balances.

Vibration Diagnostics

The PBS-4100+ system has tools specifically designed to help you quickly identify the sources of vibrations and take the appropriate corrective action before a potential catastrophic failure.

Spectral Analysis

Pinpoint the exact sources of vibrations and solve tough diagnostics problems with the integrated spectral analysis of the PBS system.

Tachometer Signal Conditioning

With its unique tachometer signal conditioning circuitry, the PBS 4100+ can accept speed signals from all engine types and tachometer generators. Phasing (1/REV) information can be derived from all types of odd-tooth signals, including long, short, and offset (phase) tooth embedded signals. An external 1/REV output for outside equipment is provided.



BONUS FEATURE

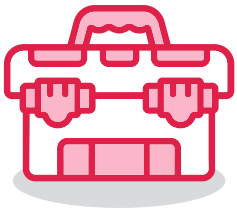
Perform self-calibration with the 1510A Signal Generator

Why choose the PBS-4100+?



Multiple Data Views

While the system is collecting data, users may view the data in several different formats. These data displays include tables, bar graphs, x-y plots, waveforms, vibration surveys, strip charts, frequency spectrums, and waterfall spectrums.



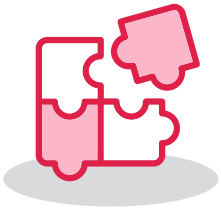
Durable and Portable

WIth its rugged exterior design and battery-powered use, the PBS-4100+ is an ideal solution for on-wing engine vibration analysis and balancing. Enabling engineers to perform troubleshooting and diagnostics easily.



Sophisticated Trim Balancing

The elegance of the PBS-4100+ series is the concealment of the science behind a simple user interface. When vibration levels need to be reduced, the WinPBS Balancing Wizard gets the job done quickly and accurately. Trial weight and stored influence coefficient (“one-shot”) balancing methods are both supported.



System Expandability

The PBS-4100 series is capable of expansion to meet your future vibration analysis and balancing requirements. MTI Instruments, Inc. is consistently developing new software updates and engine files to keep you flying.



Cyber Secure Software

The WinPBS software is updated to provide users and their data with a high level of protection from potential cyber security threats that lead to downtime and lost data.

The PBS-4100+ system is the only system that automatically collects and stores vibration data for future reference



Data Storage, Retrieval, and Reporting

Any data acquired with the PBS-4100+ can be saved and viewed at a later date, printed or transferred to other computers. All balancing and diagnostic information is stored by engine type and serial number for easy reference. Detailed reports provide complete information on every balance operation, including data readings, trial weights, and balance solutions.

Software Configurable Tracking Filters

Up to 7 unique tracking filters can be configured for each vibration channel. These filters can be used to track rotor synchronous components and other frequencies of interest. Default filters are used to correlate vibration content to the spools in the engine. User-defined filters can track possible faults on gearbox accessories. These tracking filters can eliminate the need for thousands of dollars of hardware and free up valuable rack space.

PBS-4100+ | ready for action

MTI's latest generation of PBS-4100 systems joins earlier versions in serving the U.S. military on the flight line and in test cells for all the following engine types:

- F100-100, 35, -135, -119, -200, -220, -229
- F101-102
- F103
- F108
- F110-100, -129, -132, -400
- F117-100
- F118-100, -101
- F404-102, -400, -402, -F1D2
- F414-400
- J52
- J79
- J85
- TF30
- TF33-3, -5, -9, -102
- TF33-7, -100
- TF34-100A, -400B
- TF39-1C

The PBS-4100 product line has been proven on the following commercial engine types:

- ALF502
- Ariel 1C2
- BR700
- CF34 Series
- CF6-6, -50, -80
- CFE738
- CFM56-2, -3, -5, -7
- CFM LEAP Series
- GE90
- GP7000, GP7200
- GMA3007
- HF118
- JT3D Series
- JT8D Series
- JT9D Series
- JT15D Series
- LF507-1F, -1H
- PT6
- PW100 Series,
- PW110 Series
- PW120 Series
- PW2037/2040
- PW4000 Series
- PW Gear Turbofan Series
- RB211-22 Series
- RB211-524 Series
- RB211-535 Series
- Spey 511, 512
- Tay 610, 611, 620, 650, 651
- TFE731-2, -3, -5
- Trent 720
- Trent 800
- Trent 900
- Trent 1000
- Trent XWB
- T-700
- T-56
- T-55
- T-64
- GE38
- V2500-A1, A5

APU PLATFORMS:

- Honeywell APU 131 Series (-9A, -9B)
- Garrett Honeywell 85-129 series
- Honeywell 331-2x0 series APU
- PWC APS3200

AERODERIVATIVE INDUSTRIAL TURBINES:

- GG4
- FT4
- GG8
- FT/PT8
- FT4000
- LM1500
- LM2500
- LM5000
- LM6000

DON'T SEE YOUR ENGINE TYPE LISTED?



MTI Instruments will collaborate with you and build your custom engine configuration

Both On-wing and Test Cell

Are you a Test Cell Operator? The PBS-4100 is available in two different models.

You may choose a lightweight system (PBS-4100+) to be used on-wing (engine test on aircraft) and a test-cell version (PBS-4100R+) intended for use in a production or overhaul facility. The principal of operation of both systems are identical.

The PBS-4100R+ Is a standard for test cells globally and is supported by nearly all of the test cell data systems by the major test cell integrators.





Product Specifications

Laptop Computer	Panasonic Toughbook CF-33 (2 in 1 PC)
Data Acquisition Unit (DAU)	Power: Internal Li-Ion battery pack + AC Adapter Battery Life: 4 hrs (typical) Weight: 14.4 lbs (6.5 kg) Dimensions: 1.8 x 11.4 x 12.3 in (4.6 x 30.0 x 31.2 cm) Durability: 4 ft drop on any side
Vibration Measurement	4 Input Channels 0 to ±10 Volts Peak 5 Hz to 25 kHz
Speed Measurement	3 Input Channels 1/REV, N/REV, and Odd-Tooth types (long, short, offset) 100 mV to 200 Volts Peak-Peak 150 to 100,000 RPM
Balancing	One Shot (stored influence coefficient) or Trial Weight Up to 20 speeds, 4 channels, and 2 planes simultaneously
Included Software	150 to 100,000 RPM

System Components and Parts



DAU (in DAU carrying case)

Note: DAU power supply is enclosed in cover



Laptop (in laptop carrying case) & Laptop Power Supply



Printed User Manual



Vibration Adapter Cable



Ethernet Cable

Resources for Your Success

Training

- Customizable 2 or 3 day hands-on training examining the 4-step process to minimize engine vibration levels.
- Your technicians will be proficient at setting up and running the tests and subsequent actions required to optimize operational performance and safety of your engines.
- FAA approved curriculum to earn either 16 or 25 hours of credit towards AMT Awards program

Service Packages

- Maximize the useful life of your MTI product to keep performance at peak condition.
- Promotes regular service checks with calibrations to identify wear and tear issues earlier.
- Reduce service down time with priority support and avoidance of lengthy PO processes.



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