DEWESoft®

ROTATING MACHINERY

BALANCING

PRODUCT DATA

BAL2019 - V1.1.

BALANCE YOUR ROTORS WITH EASE. AVOID DEFECTS AND REDUCE DOWNTIME.
ENSURE SMOOTH OPERATION AND LONG MACHINERY LIFETIME.

INTRODUCTION

Balanced rotors are essential for the smooth operation of rotating machinery. Unbalance will create high vibrations, reducing machine life and causing material defects. The Dewesoft Balancing solution is a powerful tool to eliminate unbalance on-site and reduce downtime. It ensures fast and simple setup and configuration, ease of use and is a good value for money.

Powerful software and handy Dewesoft instruments, make up a smart tool to reduce any imbalance of rotors - preventing excessive loading of bearings and reducing the risk of tear and fatigue failure. Balancing is crucial when it comes to optimizing machining-process quality and increasing the lifespan of machine tool components. Dewesoft Balancing module can be used in a configuration as simple as one ACC+ input and can be expanded to several instances of dual-plane balancing modules.

APPLICATIONS

Rotating machinery - either driving or being driven - is a major and critical component of many mechanical systems in the industry; aerospace and automotive, oil and gas, power generation, waste treatment, process industries and in many other applications.

Engines, power trains, turbines, pumps, compressors, electric motors, etc. can be evaluated and maintained by performing balancing.

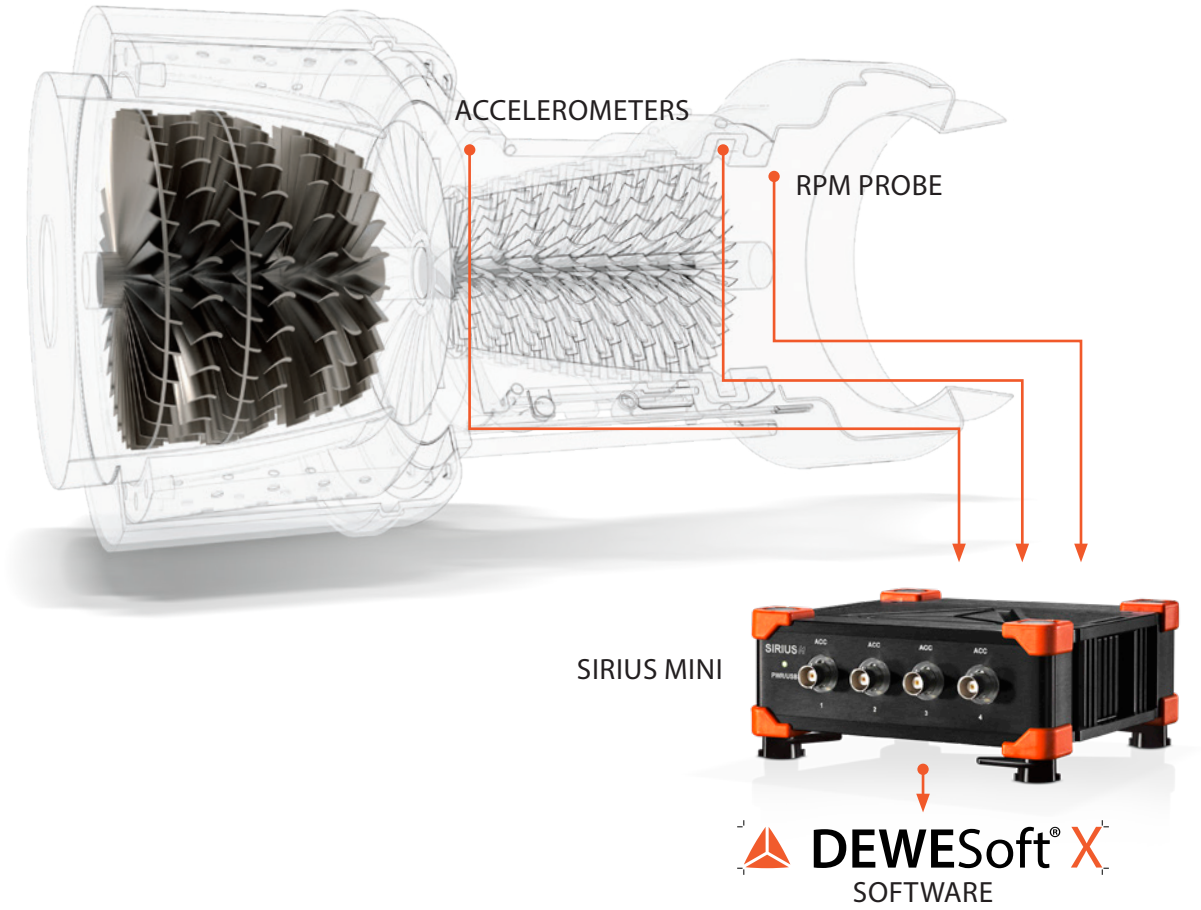
- Dynamic, on-site balancing of rotating machinery
- Trim balancing using stored rotor data (influence coefficients) from balancing measurements
- Single plane (narrow disc) or dual plane (long shaft) balancing.

FUNCTIONALITY

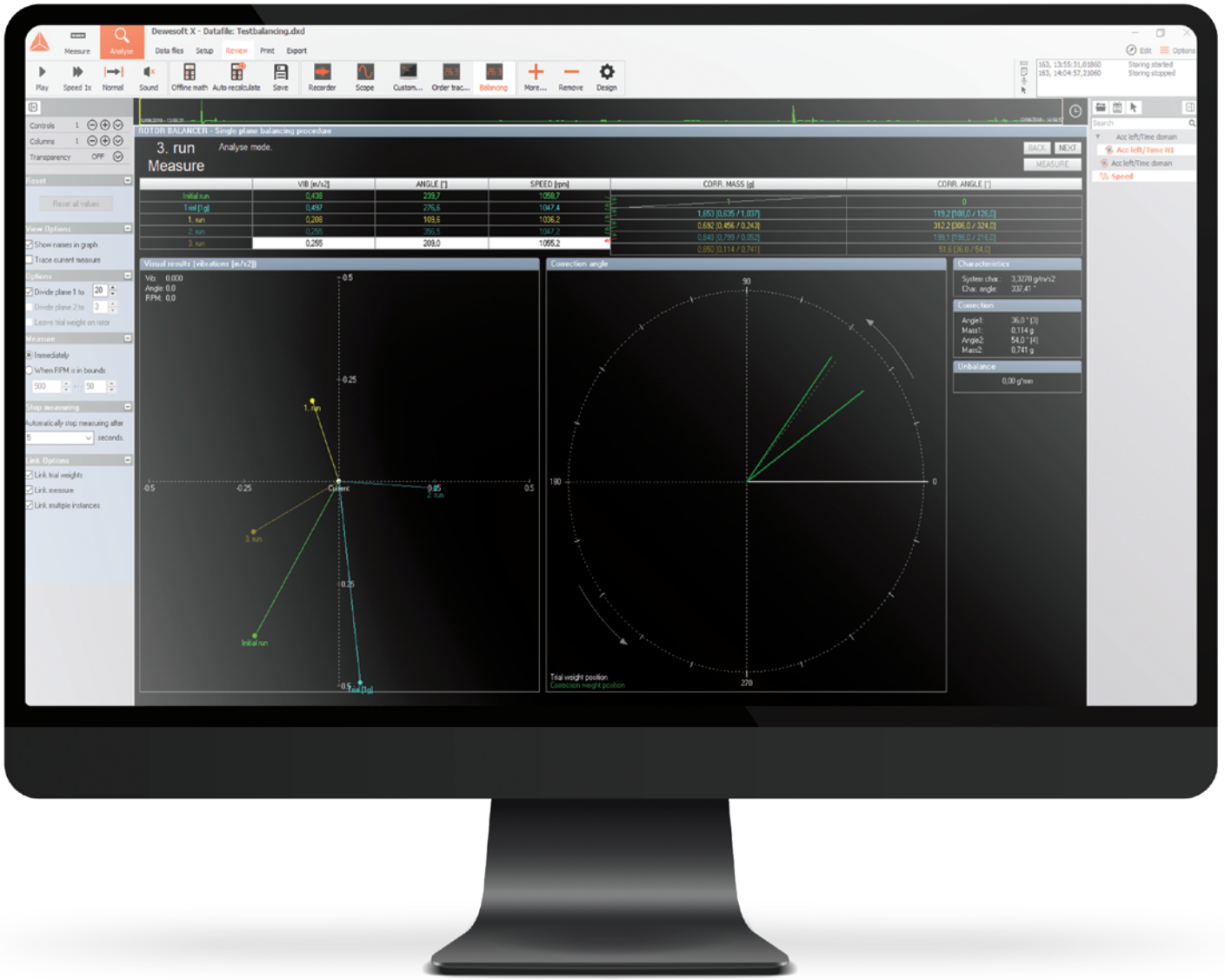
Unbalance in a rotor is the result of an uneven distribution of mass, which causes the rotor to vibrate. The interaction of an unbalanced mass component with the radial acceleration due to rotation generates a centrifugal force. Since the mass component rotates, the force also rotates and tries to move the rotor along the line of action of the force. In most cases the rotor unbalance is related to the first order, the rotational frequency. The vibration will be transmitted to the rotor's bearings, and any point on the bearing will experience this force once per revolution.

Balancing aims to eliminate or minimize vibrations related to the first order. When balancing, the initial operating state is measured, a trial weight of the known mass is then added, the position and mass of the counterweight are calculated, the trial weight is removed and finally, the calculated weight is attached to the right angle, to cancel out the imbalance.

Depending on the machinery, single or dual plane balancing is used. Selecting one plane or two planes balancing generally depends on two factors. One of the factors is the ratio of the length of the rotor (L) to the diameter of the rotor (D). The other factor is the operating speed of the rotor.



FUNCTIONALITY



WEIGHT SPLITTING

Option to split needed balancing weight into equidistantly spaced points, for example, holes on the rotor or turbine blades.

REPEAT A STEP

In case of a mistake, while balancing, you can return to the last good known position and proceed from there.

SINGLE OR DUAL-PLANE BALANCING

Single plane (narrow disc) or dual plane (long shaft) balancing can be performed.

STEP BY STEP PROCEDURE

Guided steps for flawless operation including easy setup of angle sensor with live preview. Multiple modules can be combined for multi-axis balancing to save time and improve the quality of balancing.

RICH VISUALIZATION

Results from all runs are displayed. Live visualization of the unbalance vector is available to evaluate the stability of measurements.

INITIALIZE WITH SYSTEM CHARACTERISTICS

When system characteristics of a particular shaft are known, there is no need to repeat the trial weight run; characteristics are entered, and the correction mass calculated immediately.

SPECS

DAQ SYSTEM - SIRIUS ACC TYPE INPUT		
Inputs		
Input types	Voltage, IEPE	
ADC Type	24bit delta-sigma dual core with anti-aliasing filter	
Sampling Rate	Simultaneous 200kS/sec	
Ranges (Dual Core Low Range)	**±10V (±500mV)**	**±500mV (NA)**
Input Accuracy (Dual Core)	±0.1% of reading ±10(1)mV	±0.1 of reading ±1(NA)mV
Dynamic Range@10kS (Dual Core)	140 dB (160 dB)	135 dB (NA)
Typ. SNR@50kS (Dual Core)	107 dB (125 dB)	100 dB (NA)
Typ. CMR @ 50Hz/1kHz	140/120 dB	140/120 dB
Gain Drift	Typical 10 ppm/K, max. 30 ppm/K	
Offset Drift	Typical 0.5 µV/K + 2 ppm of range/K, max 2 µV/K + 10 ppm of range/K	
Gain Linearity	<0.02%	
Inter Channel Phase-mismatch	0.02° * fin [kHz] + 0.1° (@ 200 kS/sec)	
Channel Cross talk	>160 dB @ 1kHz	
Input Coupling	DC, AC 0.1 Hz,1Hz	
Input Impedance	1 MΩ (270kΩ for AC coupling ≥ 1Hz) in parallel with 100pF	
Overvoltage Protection	In+ to In-: 50 V continuous; 200V peak (10msec)	
IEPE mode		
Excitation	2, 4, 8, 12, 16 or 20mA	
Compliance voltage	25 Volt	
Output Impedance	>100 kΩ	
Sensor detection	Shortcut: <4Volt; Open: > 19Volt	
Additional Specifications		
Input connector BNC	BNC	
TEDS support	IEPE mode only	

SOFTWARE: DEWESoft X3	
Recommended	
Processor:	Intel Core i7 with 4 Cores (3rd generation or higher)
RAM:	8 gigabyte (GB)
Hard drive:	Solid-state drive (SSD)
Graphic card:	Compatible with DirectX 11
Display	1280x720 (HD Ready)
Operating system:	Windows 10 64-bit
*Actual requirements may be different due to specific setup configuration.	

TYPICAL CONFIGURATIONS

BASIC Balancing:

- 1x SIRIUS MINI 3xACC 1xACC+
- 1-4 x I1TI-500g-1 accelerometer
- 1 x DS-TACHO2 RPM probe
- Dewesoft X3 DSA license

ADVANCED Balancing:

- 1 x R1DB Dual core 6xACC, 2xACC+
- 8 x I1TI-500g-1 accelerometer
- 2 x DS-TACHO3 RPM probe
- Dewesoft X3 DSA license

RELATED PRODUCTS

- FFT
- Bearing analysis
- Torsional vibration
- Order tracking
- Sound Level Meter

DEWESoft®

LEARN MORE:

dewesoft.com/applications/rotating-machinery/balancing

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