DEWESoft®

MODAL TEST AND ANALYSIS

MODAL TEST IS BUILD WITH THE USER IN MIND. IT'S POWER COMES FROM EASY IMPACT HAMMER OR MODAL SHAKER SETUP, INTUITIVE MEASUREMENT AND QUICK ANIMATION OF RESULTS.
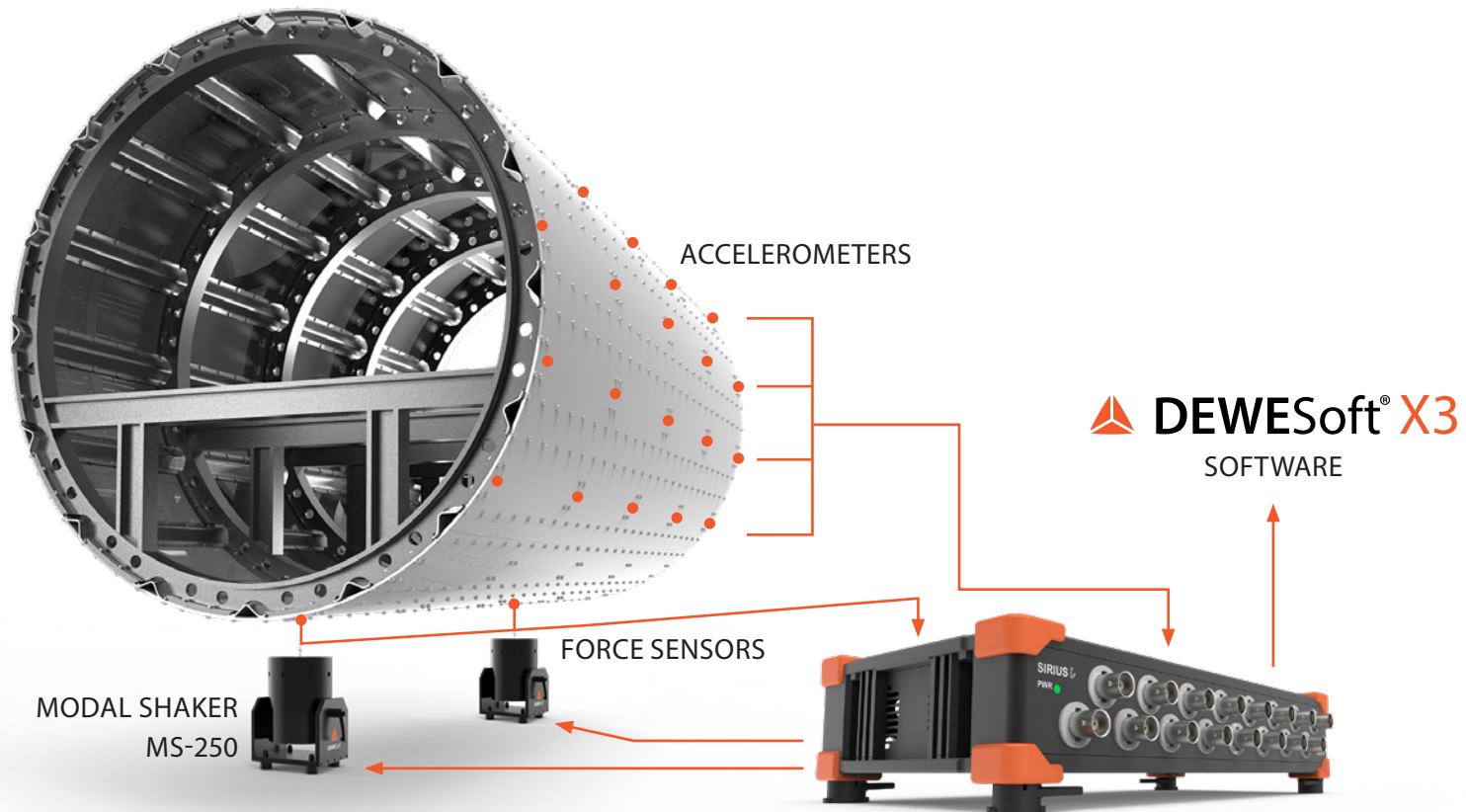
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INTRODUCTION

Modal analysis is an indispensable tool for understanding the behaviour of structures. Dewesoft Modal Test performs classical acquisition of Frequency Response Functions (FRFs) by using impact hammer or shaker excitation. Impact hammer operation mode allows movement of either excitation hammer or response sensors during measurement, thus enabling measurements with only one or multiple acceleration sensors. Working on a big structure it is possible to do the measurement in parts and merge multiple data files in post-processing. Transfer functions can be animated during acquisition or later in post-processing. Geometry can be imported via standard UNV format or can be drawn with our UNV Geometry Editor.
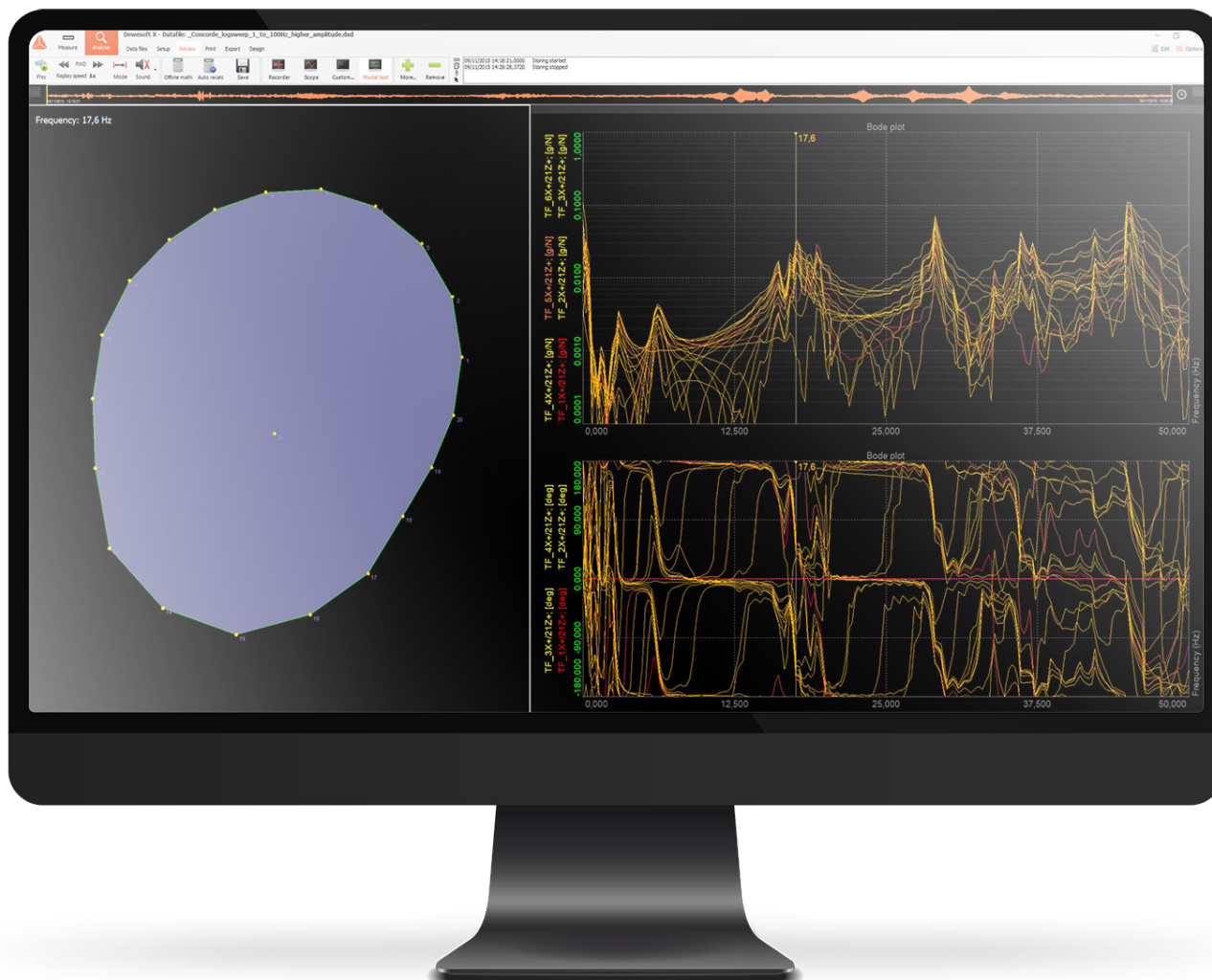
Dewesoft offers a complete easy to use solution with analyzer, sensors and software offering rich visualization and animation of results. Based on SIRIUS, a versatile USB data acquisition system, scalable channel count and Dewesoft X software it offers powerful data processing capabilities which can be performed parallel to the Modal Test measurement.

FUNCTIONALITY

- **Impact hammer excitation:** Experimental Modal Analysis: Impact hammer testing is ideal for small and light-weight structures.
- **Shaker excitation:** Experimental Modal Analysis: Shakers have an advantage over the impact hammer as they can supply more energy, and thus enable testing of larger structures.
- **Operating Deflection Shape Analysis (ODS):** ODS allows visualization of the vibration patterns of a machine or structure in operation mode as influenced by its own forces.
- **Advanced Modal Analysis using ME'scope:** Full compatibility with ME'Scope in terms of time and frequency data transfer between Dewesoft and ME'Scope. This allows deep analysis using state-of-the-art local and global modal parameter extraction techniques, different mode indicator functions and analysis validation tools.

ACCELEROMETERS

DEWESoft® X3
SOFTWARE

FORCE SENSORS

MODAL SHAKER
MS-250

MERGE DATA FILES
Perform measurements per parts and merge results in analyse mode, e.g. to ease measurement of large structures.

ORDINARY MIF
Preview natural frequency locations with Ordinary Mode Indicator Function.

GEOMETRY BUILDING
Customize geometry inside Dewesoft UNV Geometry builder or Import from standard UNV format.

ANIMATION
Animate structure with one click of a button. User can animate each coordinate system axis separately or all at once.

FAST SETUP
Use additional helper functionalities to build the setup in more complicated cases, e.g with a lot of channels and groups.

EXPORT TO UNV
Export data to a UNV format, the industry standard for Modal Analysis, or other formats.

DAMPING AND EXACT FREQUENCY
Estimate viscous or structural damping and exact frequency of the mode using Modal circle.

H1, H2 FRF ESTIMATOR
Estimate Frequency response function via H1 or H2 method to minimize noise on input or output.

STOP AFTER
Automatically stop measurement after a predefined number of averages was acquired.

SIMO ANALYSIS
Utilize the standard SIMO (Single Input & Multiple Output) method.

AVERAGING
Benefit from Linear, Peak and Exponential averaging.

WINDOWING
Enjoy all classical windows for excitation and response data: Excitation, Response, Hanning, Hamming, Blackman, Flat Top, Triangle.

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
MODAL TEST BASIC:

- DEWESoft X3: DSA Licence
- SIRIUSm-4xACC: Sirius mini, 4 Channels
- 1x IH-500N-1: Series Impulse Hammer
- 1x I1A-50G-1: Series Miniature Accelerometer

MODAL TEST ADVANCED:

- DEWESoft X3: DSA Licence
- SIRIUSi HD - 16X ACC, 16 input channels
- 1x IH-500N-1: Series Impulse Hammer
- 5x I3A-50G-1: Series Triaxial accelerometer

SHAKER MODAL TEST:

- SIRIUSi-8xACC, 8xAO: Sirius, 8 Channels, 8 Analog outputs
- 1x Dewesoft modal exciter MS-20
- 1x 1051V1 (44N): Force sensor
- 1x I1A-50G-1: Series Miniature Accelerometer
- 2x Dytran 6011A series Cable (0,9m - 15m)