

Automotive
Energy & Power Analysis
Aerospace
Transportation
General Test & Measurement



Modal Analysis

Modal Analysis is needed in every modern construction. The measurement of system parameters, called modal parameters, are essential to predict the behavior of a structure.

These modal parameters are needed also for mathematical models. Parameters like resonant frequency(s), structural damping, and mode shapes are experimentally measured and calculated.

DEWETRON provides a hard and software solution which is adapted to your application. Starting up from 8 channels used for maintenance, service and troubleshooting till up to 1000 channels used for complex structures.

The easy-to-use software is suitable for professional and occasional users.

Key Features

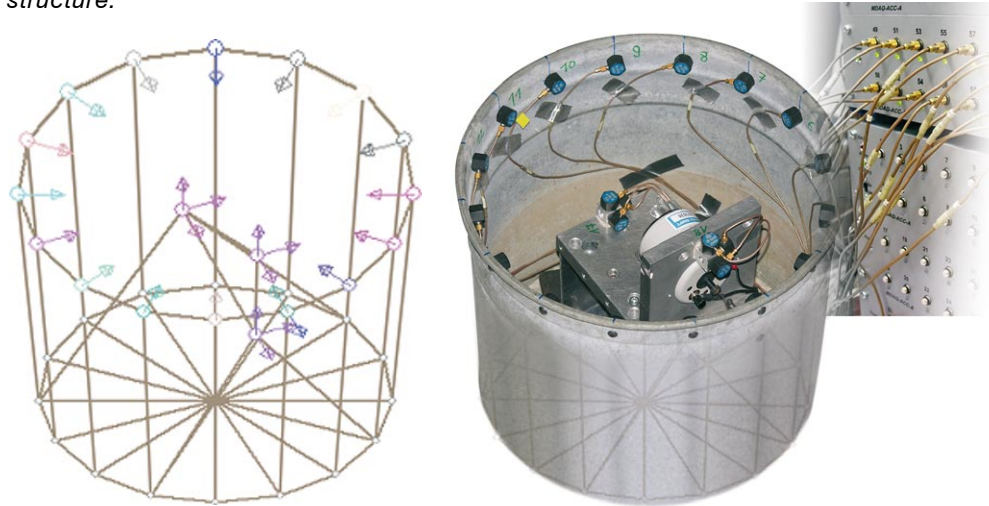
- SISO, SIMO, MIMO configurations
- Spectral ODS
- Geometry editor
- Mode indicator function MIF
- Circle fit analyze tool
- Function generator up to 16 channels
- FRF from stored time data
- Triggered-, free-run measure mode
- Roving hammer excitation support
- Unv-file export for modal packages (ME-Scope, ...)
- Animated FRFs
- Up to 1000 channels linked over NET

Re-inventing Data Acquisition

worldwide
DEWETRON
www.dewetron.com

Overview

To measure a FRF of a structure basically two channels are needed. One channel is used to measure the excitation force, which could be an Impact hammer or a shaker. This excitation force excites the structure, and at least one acceleration sensor measures the response of the structure. Out of that the transfer characteristic (FRF) and the modal parameters are calculated. To determine the structure you have to measure several points to get the whole system identified. This could be done either with one response or up to hundred or thousand channels depending on the complexity of the structure.



Channel Setup

In the channel setup the excitation-, and the response channels are defined. DEWETRON amplifiers support the state of the art TEDs interface which gives the maximum comfort especially at high channel count.

NUM	LIBRARY	GROUP	AMPLIFIER	TYPE	PHYSICAL UNITS	SCALE	OFFSET
0	Used	Excitation	DAQP-ACC-A	500 mV_10 kHz	- [N]	1	50
1	Used	V1	DAQP-ACC-A	500 mV_10 kHz	[g]	6	Zero
2	Used	V1	DAQP-ACC-A	500 mV_10 kHz	[g]	5	Zero
3	Used	Z1	DAQP-ACC-A	500 mV_10 kHz	[g]	5	Zero
4	Used	V2	DAQP-ACC-A	500 mV_10 kHz	[g]	5	Zero
5	Used	V2	DAQP-ACC-A	500 mV_10 kHz	[g]	5	Zero
6	Used	Z2	DAQP-ACC-A	500 mV_10 kHz	[g]	5	Zero
7	Unused	A17	Direct		-0.05		0.05

The FRF Setup provides all parameters needed for the measurement

- Free run, triggered mode
- Average
- Excitation window length
- Response decay
- Trigger levels
- Overlap

Also the channel definition according to structure is done in the FRF setup. A structure could be imported from any other software with unv. file format or created with the included geometry editor.

Frequency span: 2000
 Number of lines: 200
 Calculation method: H1
 FRF MENU: Free run / Triggered
 Averaging mode: Linear
 Excitation window length: 50
 Response decay: 100
 Pretrigger: 5
 Trigger level: 0
 Stop conditions: Stop on overload, Stop after 5 avgs.
 Channel range: select channel

Channel	Excitation	Excitation
Response	Point index	13+
AI 1	13+	H13+13+
AI 2	23+	H23+13+
AI 3	33+	H33+13+
AI 4	43+	H43+13+
AI 5	53+	H53+13+
AI 6	63+	H63+13+
AI 7	73+	H73+13+
AI 8	83+	H83+13+
AI 9	93+	H93+13+
AI 10	103+	H103+13+
AI 11	113+	H113+13+
AI 12	123+	H123+13+
AI 13	133+	H133+13+
AI 14	143+	H143+13+

Point Maker: Nodes, TraceLines, Objects
 Num. Of Nodes: 2, 2, 2
 Delta: 1, 1, 1
 Offset: 0, 0, 0
 Rotation Angle: 0, 0, 0
 Create With TraceLines: Create
 CIRCLE: Radius: 10, Num. 13 Noes: 0, Offset: XY, Plane: Z
 Create

Measurement



The prepared measurement screen will give you all the control possibilities for either running or triggered FRF.

Channel Overload Indicator

Phase Coherence RE-Img

Transfer Curve

The tool bar provides all important and necessary functions which are needed during the measurement. At Single Input Single Output (SISO) measurement either the excitation or the response could be moved, because sometimes it is easier to move the excitation than the response. DEWETRON supports both types of this measurement.



Analysis

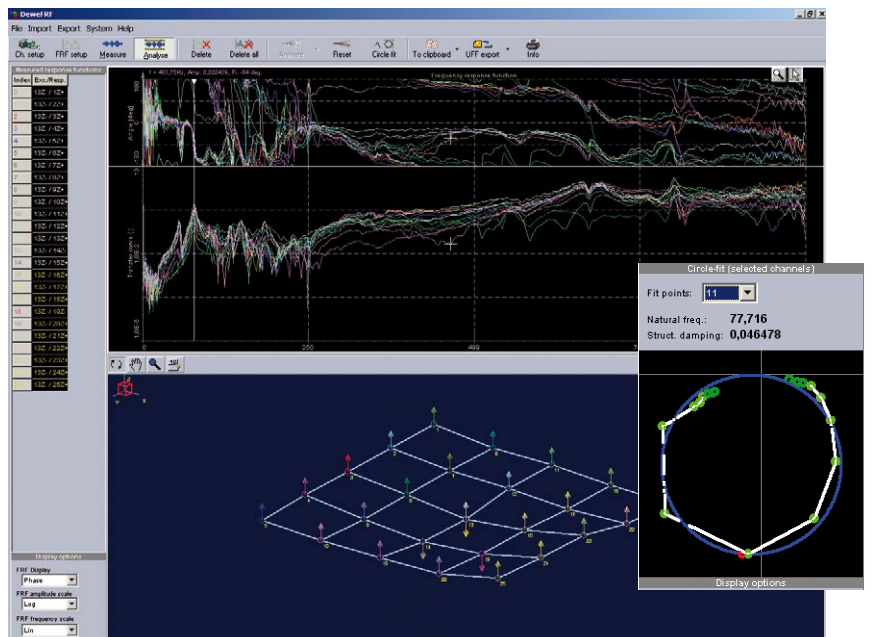
In the analyze screen the FRF spectra are shown together with the geometry.

The included analyze tools like

- animation of the geometry,
- Circle Fit,
- MIF

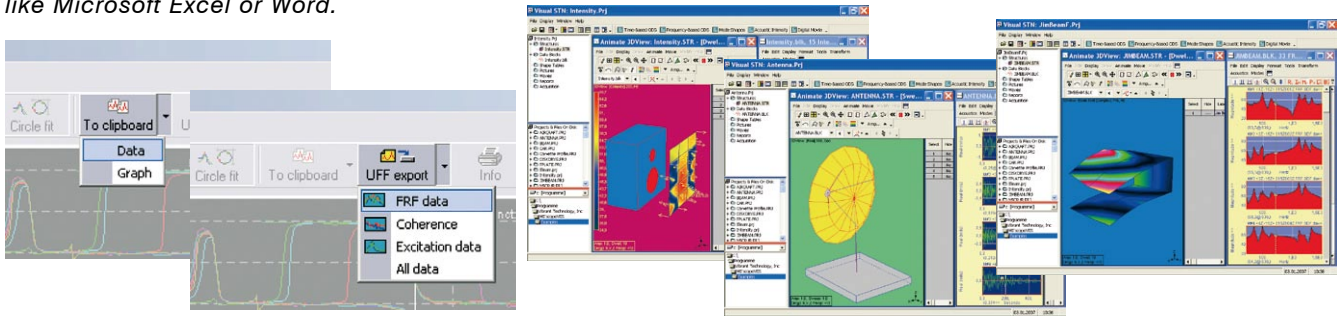
are provided to determine the results immediately.

In case of an error the spectrum could be re-measured immediately. This saves time and money. Display options could be set according to the needs, Phase, Coherence, Re-, Imag, are only a few possibilities which could be set.



FRF Export

For further investigation and analyses in modal packages like ME-Scope the FRF data, coherence and excitation can be exported to the UFF (Universal File Format) – or simply copied to clipboard – and used in standard applications like Microsoft Excel or Word.



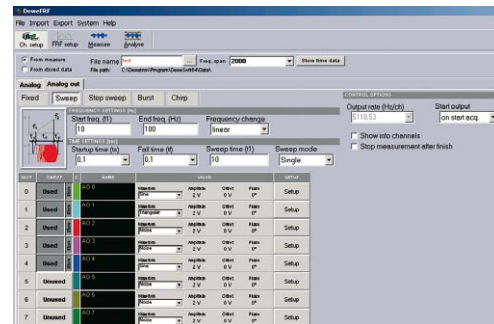
Function Generator

For a running FRF the structure is excited with a shaker. Here either one shaker or multiple shakers for big structures are used. The shaker(s) have to be controlled mainly in amplitude, phase, waveform and frequency. DEWESoft offers an integrated function generator up to 16 Channels which is fully software controlled.

Various time patterns like

- Fixed
- Sweep
- Step sweep
- Burst
- Chirp

are configurable for any application.



Technical Data Function Generator

- Up to 16 channels
- 16 bit D/A +1 mV to +-10 V
- Watchdog
- Frequency resolution 1 mHz with 10 ppm
- Phase adjustment 0,05°
- Smooth change for shaker control
- Sine, square, triangle, ramp, noise,..
- Up to 1 MHz D/A rate SNR>80 dB, THD<0,05%
- Arbitrary output/file replay
- Fix frequency, lin/log SWEEP, CHIRP, BURST Mode or STEP sine

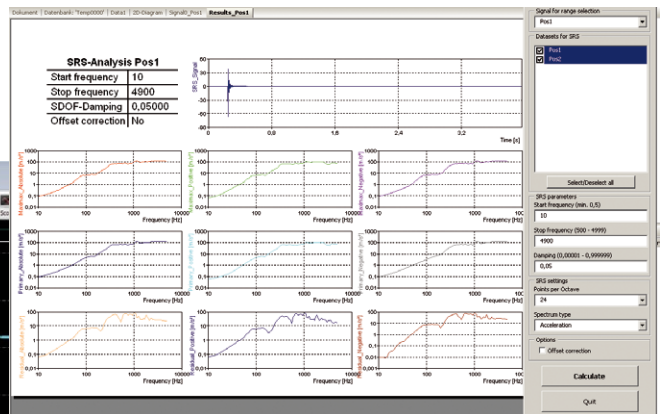
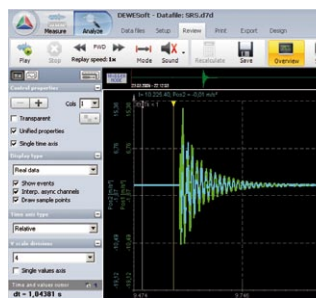
Hardware Requirements

- ICP®-Inputs
- Orion1624 Series AD card
- DEWETRON Option FG
- DEWESoft Option FRF
- DEWESoft Option SRS

Shock Response Spectrum (SRS)

The shock response spectrum shows the maximum responses of a series of uniformly damped single-degree-of-freedom (SDOF) systems caused by a shock waveform applied on the structure. After setting damping, resolution (12,24,48,96/octave) and primary section of the spectra are calculated out of the time domain signals.

The time domain signals are recorded with DEWESoft and exported to FlexPro.A prepared SRS-Script with user interface supports a convenient straight forward procedure for fast results.



Please ask for your customized solution!

DEWETRON Ges.m.b.H. • Parkring 4 • A-8074 Graz-Grambach
Tel (0043) 316 3070 0 • Fax (0043) 316 3070 90 • sales@dewetron.com

