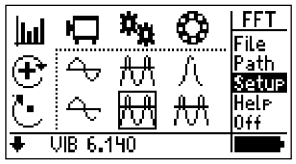
PRÜFTECHNIK

TechNote #CM2: VIBSCANNER®

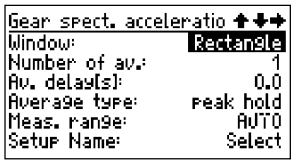
Two methods to capture the resonance frequency of a structure

Method 1:

Capture the resonance frequency with Free Run in the spectrum measurement.



Select the setup



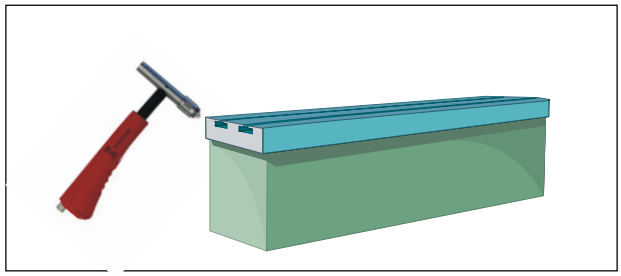
Edit the setup settings

Setup in the VIBSCANNER

- Select a spectrum measurement setup:
  Acceleration / 5kHz Fmax / 3200 lines

- Edit the measurement setup as follows:
  Window: Rectangle
  Number of av.: 1
  Av. delay[s] 0.0
  Average type: peak hold

- Start the measurement and excite the structure with gentle taps from your modal hammer.

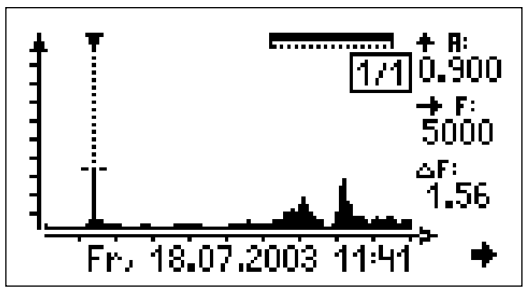


Excite the structure with a modal hammer

Notes:
In order to get the right amplitude range with the VIBSCANNER, hit the structure with the hammer while VIBSCANNER is autoranging.
Modal hammers have different tips to excite frequencies in different frequency bandwiths. The softer the tip the lower the frequency.

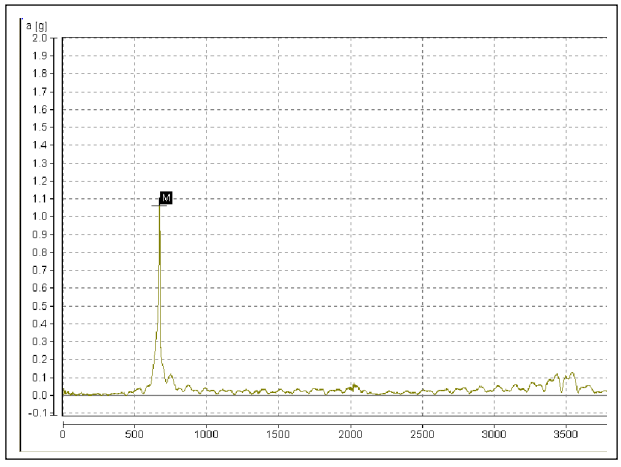
- Store the data in VIBSCANNER.

- Load the spectrum into OMNITREND with the 'Upload multimode to PC' function.



Measured spectrum in the VIBSCANNER display

The resonance frequency in the spectrum shown on the right is 672 Hz.



Data evaluation and documentation in OMNITREND

Method 2:

Time waveform can be used as an alternative method to capture the resonance frequency of a structure. This method allows you to catch the maximum vibration level. The impact can be recorded in the VIBSCANNER time waveform module. In OMNITREND the spectrum should be calculated with no averages.

Setup in the VIBSCANNER

- Select a time waveform measurement setup with measurement type 'Acceleration'

- Edit the measurement setup as follows:
  Max. Frequency: 1000 Hz
  Meas. time: 1000 ms

- Start the measurement and excite the structure with gentle taps from your modal hammer.

Notes:
In order to get the right amplitude range with the VIBSCANNER, hit the structure with the hammer while VIBSCANNER is autoranging.
Modal hammers have different tips to excite frequencies in different frequency bandwiths. The softer the tip the lower the frequency.

- Store the data in VIBSCANNER.

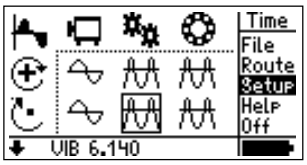
- Load the time waveform into OMNITREND with the 'Upload multimode to PC' function.

- Open the time waveform in OMNITREND

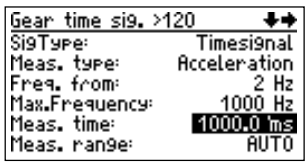
- Click on the 'FFT icon in the tool bar to open the 'Calculate FFT' tab.

- Configure the FFT calculation as follows:
  - Power spectrum
  - 800 lines
  - Recangular window

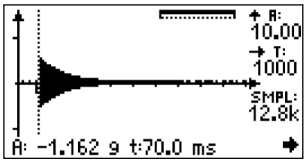
The calculated resonance frequency in the spectrum shown on the right is 669 Hz.



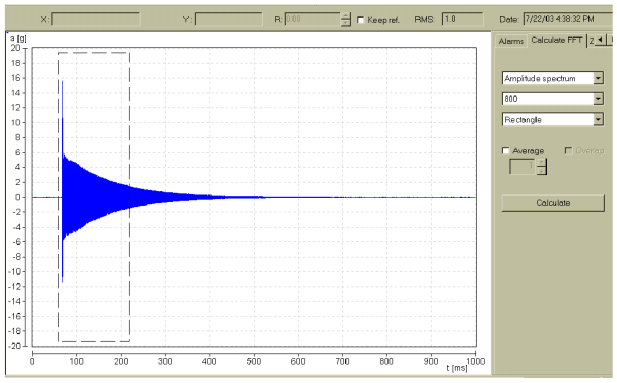
Select the setup



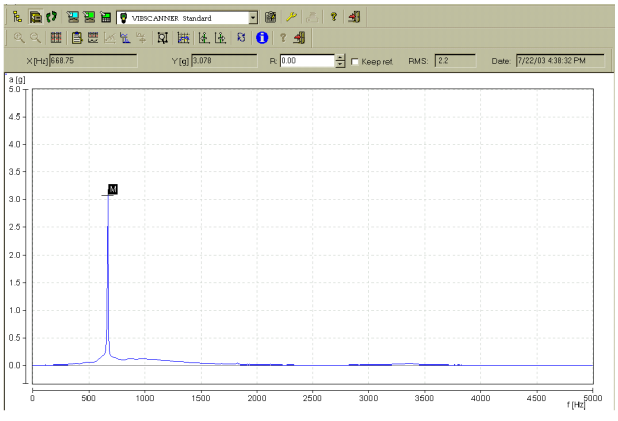
Edit the setup settings



Measured time waveform in the VIBSCANNER display



Settings for the FFT calculation in OMNITREND



Calculated FFT spectrum

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