

THE MEASURABLE DIFFERENCE.



DEWETRON

▼

OXYGEN TRAINING > SWEEP SINE ANALYSIS



GENERAL PURPOSE

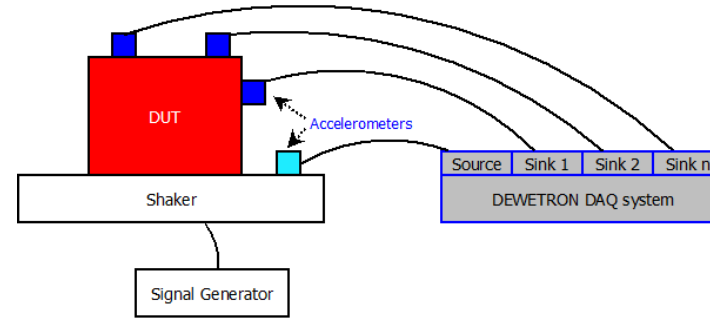


DEWETRON

Analysis Tool for Shaker Applications with Swept-Sine Excitation

Calculates Amplitude and Phase Values of over 100 Channels simultaneously

Analyze Frequency Response from 1 Hz up to 20 kHz





DEWETRON

CREATING A SWEPT SINE ANALYSIS

- 1 Open the channel list and select the checkbox of the reference channel
- 2 Select the checkbox(es) of the input channel(s)
- 3 Press the + button
- 4 Select *Swept Sine Analysis*
- 5 Press the *Add* button

The screenshot shows the DEWETRON software interface. On the left, a channel list is visible with checkboxes for various channels. A red circle with the number '1' highlights the checkbox for the reference channel. A red circle with the number '2' highlights the checkboxes for the input channels. A red circle with the number '3' highlights the '+' button in the bottom toolbar. The main dialog box is titled 'Add Channel - Swept Sine Analysis'. It has a 'Basic Math' section with 'Formula', 'Statistics', 'Filters', and 'FFT' options. An 'Advanced Math' section is also present. Under 'Order Analysis', 'Swept Sine Analysis' is selected, highlighted with a red circle and the number '4'. The 'Data Sources' section includes 'Ethernet Receiver' and 'Example Plugin: Simple file replay'. The 'Data Transfer' section includes 'Ethernet Card'. At the bottom of the dialog, 'Cancel' and 'Add' buttons are visible, with a red circle and the number '5' highlighting the 'Add' button. A status bar at the bottom right shows 'Node "[RemoteNode]" discovered'.



EDITING THE SWEPT SINE ANALYSIS SETTINGS

- ① Reference Channel (shaker output) can be changed here
- ② Threshold in percentage of channel input range
- ③ Frequency response either as RMS or Zero-Peak Amplitude
- ④ Start and stop frequency selection for Swept Sine Analysis
- ⑤ Step size for Swept Sine Analysis
- ⑥ Number of periods of the reference signal after which the calculation is updated
- ⑦ Input channels for swept sine analysis (several selectable)
- ⑧ Optional output of amplitude and phase as time domain channels
- ⑨ Optional output of bode diagram (frequency domain channels)

REFERENCE CHANNEL

Reference channel: Input **①**

Detection Threshold: 1 **②** %

SWEPT SINE ANALYSIS OPTIONS

Mode: RMS **③**

Start frequency: 1 **④** Hz

End frequency: 1000 **④** Hz

Step size: 1 **⑤** Hz

Periods: 1 **⑥**

INPUT CHANNELS

Show selected channels only

All Search... **⑦**

LocalNode

Filters 1

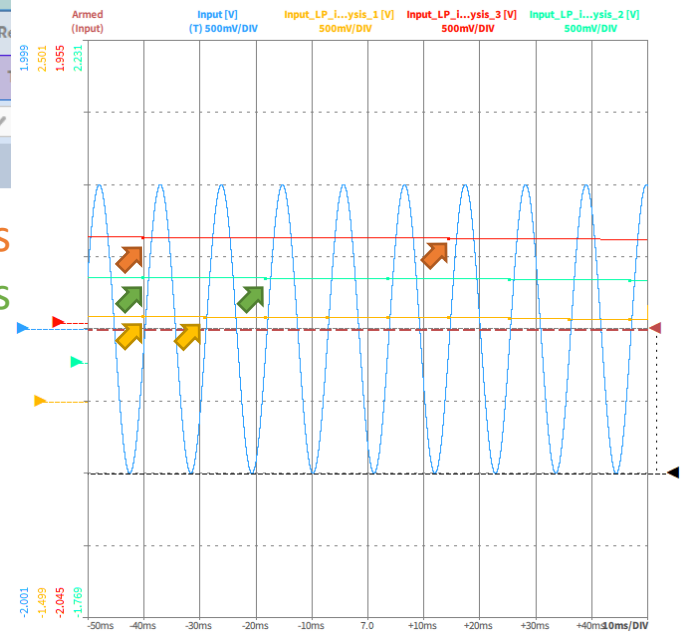
Input_LP

OUTPUT CHANNELS

Enable immediate value channels **⑧**

Enable Bode diagrams **⑨**

5 Periods
2 Periods
1 Period



SweptSineAnalysis_1	
F_fund Fundamental Frequency	Orange
Input_LP_iRMS Immediate Fundamental RMS	Yellow
Input_LP_iPhi Immediate Fundamental Phi	Light Blue
Input_LP_iUFRMS Immediate Unfiltered RMS	Red
Input_LP_RMS Fundamental RMS Bode	Dark Red
Input_LP_Phi Fundamental Phi Bode	Cyan
Input_LP_UFRMS Unfiltered RMS Bode	Green

- > Frequency domain channels:
 - > Ch_RMS: Fundamental RMS frequency response
 - > Ch_Phi: Fundamental Phi frequency response
 - > Ch_UFRMS: Unfiltered RMS frequency response
- > Time domain channels:
 - > F_fund: Fundamental frequency
 - > Ch_iRMS: Immediate fundamental RMS
 - > Ch_Phi: Immediate fundamental Phi
 - > Ch_iUFRMS: Immediate unfiltered RMS
- > Zero-peak instead of RMS selection possible

- Maximum frequency span: 1 Hz – 20 kHz
- Recommendation: Sample Rate : $20 * f_{\max}$
- Resolution 1 – 100 Hz
- Max 10 periods for averaging
- If the sweep does not exactly hit exactly one frequency bin contained in the array, data for the certain frequency bin is filled up by linear interpolation of the two narrowed frequency bins
- If one bin is hit several times, the max value will be stored



EXERCISE

Create a Swept sine Analysis

Reference channel: Sweep from 1 – 1000 Hz

Input channel 1: Filtered Reference channel:
LP-Filter; $f_c = 100$ Hz, 4th order Bessel

Input channel 2: Filtered Reference channel:
LP-Filter; $f_c = 200$ Hz, 8th order Butterworth

SweptSineAnalysis_1

REFERENCE CHANNEL

Reference channel

Detection Threshold %

SWEPT SINE ANALYSIS OPTIONS

Mode

Start frequency Hz

End frequency Hz

Step size Hz

Periods

INPUT CHANNELS

Show selected channels only

All Search...

<input type="checkbox"/>	Name
<input type="checkbox"/>	LocalNode
<input type="checkbox"/>	Filters 1
<input type="checkbox"/>	Input_LP_1
<input checked="" type="checkbox"/>	Input_LP
<input type="checkbox"/>	[RemoteNode]

OUTPUT CHANNELS

Enable immediate value channels

Enable Bode diagrams

