

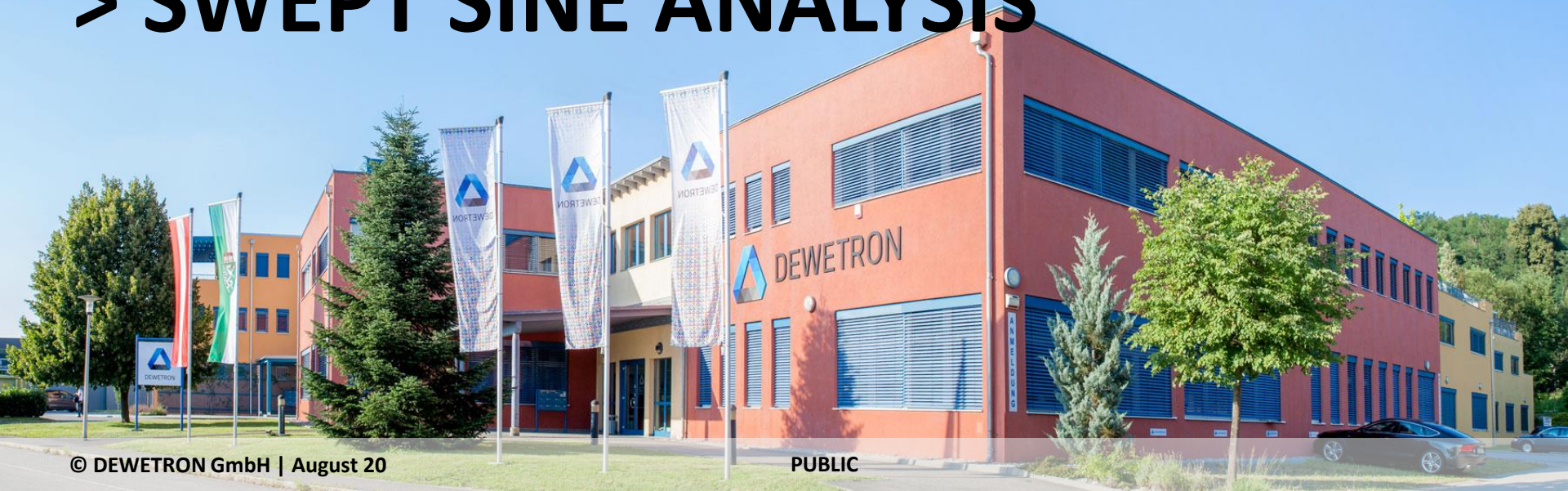
THE MEASURABLE DIFFERENCE.



DEWETRON

▼

OXYGEN TRAINING > SWEEP SINE ANALYSIS





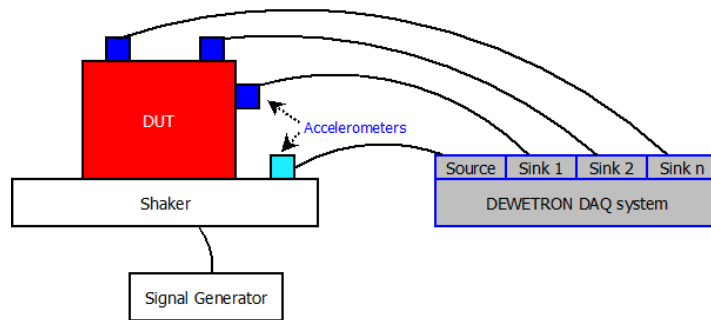
DEWETRON

GENERAL PURPOSE

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 displays the DEWETRON software interface. On the left, a channel list shows various channels under different nodes like LocalNode and RemoteNode. A red circle '1' highlights a checkbox next to the 'Input' channel. Another red circle '2' highlights a checkbox next to the 'Input_LP' channel. At the bottom left, a red circle '3' highlights the '+' button. In the center, the 'Add Channel - Swept Sine Analysis' dialog box is open. It has several sections: 'Basic Math' with fields for Formula, Statistics, Filters, and FFT; 'Advanced Math' with options for Power Group, Order Analysis, and Swept Sine Analysis (highlighted with a red circle '4'); 'Data Sources' with options for Ethernet Receiver and Example Plugin; and 'Data Transfer' with an Ethernet Card option. At the bottom right of the dialog, a red circle '5' highlights the 'Add' button. The background shows a tree view of the system with nodes like TRIONet, TRION-BASE, and TRION-2402-dACC-6-B.



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 settings)

REFERENCE CHANNEL

Reference channel ①

Detection Threshold ② %

SWEPT SINE ANALYSIS OPTIONS

Mode ③

Start frequency ④ Hz

End frequency Hz

Step size ⑤ Hz

Periods ⑥

INPUT CHANNELS

Show selected channels only

All Search...

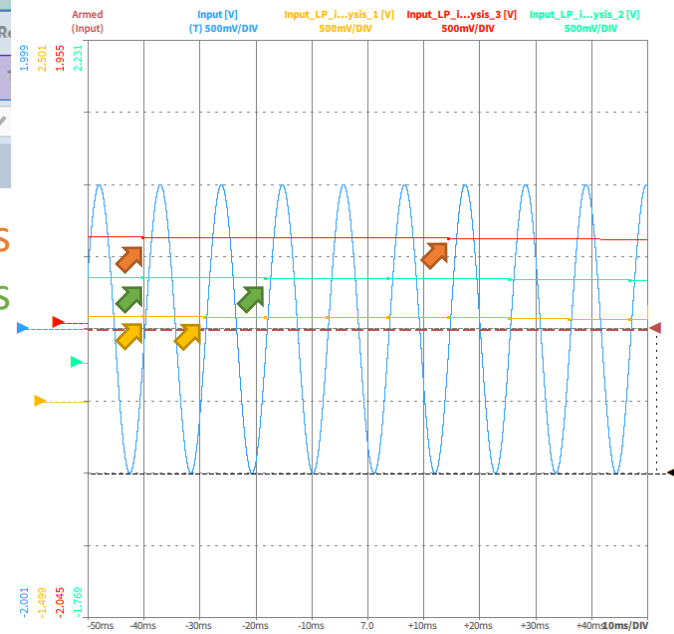
<input type="checkbox"/>	Name
<input checked="" type="checkbox"/>	LocalNode
<input checked="" type="checkbox"/>	Filters 1
<input checked="" type="checkbox"/>	Input_LP
<input type="checkbox"/>	[Re]
<input type="checkbox"/>	[Im]
<input type="checkbox"/>	[Amp]
<input type="checkbox"/>	[Phase]








OUTPUT CHANNELS

Enable immediate value channels ⑧

Enable Bode diagrams ⑨

5 Periods
2 Periods
1 Period



SweptSineAnalysis_1	
F_fund Fundamental Frequency	
Input_LP_iRMS Immediate Fundamental RMS	
Input_LP_iPhi Immediate Fundamental Phi	
Input_LP_iUFRMS Immediate Unfiltered RMS	
Input_LP_RMS Fundamental RMS Bode	
Input_LP_Phi Fundamental Phi Bode	
Input_LP_UFRMS Unfiltered RMS Bode	

- > 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 : $20 * f_{\text{max}}$
- 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...

	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

