



# Sine VIEW VR 610

SINE VIBRATION CONTROL SOFTWARE

## Easy test entry

Frequency/amplitude breakpoints in an easy to read table form. Operator can select to control constant or ramped acceleration, velocity or displacement. Automatically calculate and enter the frequency of intersection between any combination of constant acceleration, velocity or displacement lines. Up to 200 separate frequency/amplitude breakpoints can be entered, allowing entry of virtually any test spec.

## Sweep type

Either linear (Hz/minute or minutes/sweep) or logarithmic (octave/minute, decade/minute, minutes/sweep) sweeps can be specified.

## Test duration

Test duration can be entered in terms of length of time, number of sine wave cycles or number of sweeps.

## Tone tests

Sequences of fixed-frequency tones of a specified acceleration, velocity or displacement can be run. Looping functions allow easy entry of repeating tone sequences.

## Control channels

The control signal can be a single input channel, or configured as average or extremal combination of from 2 to 16 input channels.

## Sine Resonance phase Track & Dwell control-SRTD-(Optional) VR645

Transmissibility peaks can be automatically detected from a sine sweep and then dwell tests run at the detected resonance frequencies for a specified time duration or number of sine wave cycles. In a sine dwell test, the controller can automatically track the resonance frequency to keep the output on resonance even when fatigue damage causes the resonance frequency to shift.

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## Configurable safety limits

The controller can be configured to abort if the controlled acceleration goes above or below the desired level by a operator-configured number of dB. Abort limits can also be enabled for individual monitoring channels. Drive limits can be configured to protect from overdriving your shaker in cases of failed accelerometers.

## Tracking filters

Input channels have individually selectable tracking filters to remove harmonics and out-of-band noise from the measurements. The tracking filter bandwidth and signal averaging is user configurable.

## Data Storage

All of the test data can be stored to the disk for later retrieval. Data storage can be done manually, or programmed to automatically save at user-defined intervals.

## Stepped-frequency tests (Optional) VR 612

Stepped-frequency sine tests such as those used in MIL-STD-167 are supported. The on and off duration and the step size are programmable.

## Multi-channel Notching (Optional) VR 614

Automatically notches the control channel demand to pass by resonance points you don't want to overdrive.

## Large Numerical Readout

A configurable large numeric readout displays the current test frequency and channel amplitudes.

## Manual Control

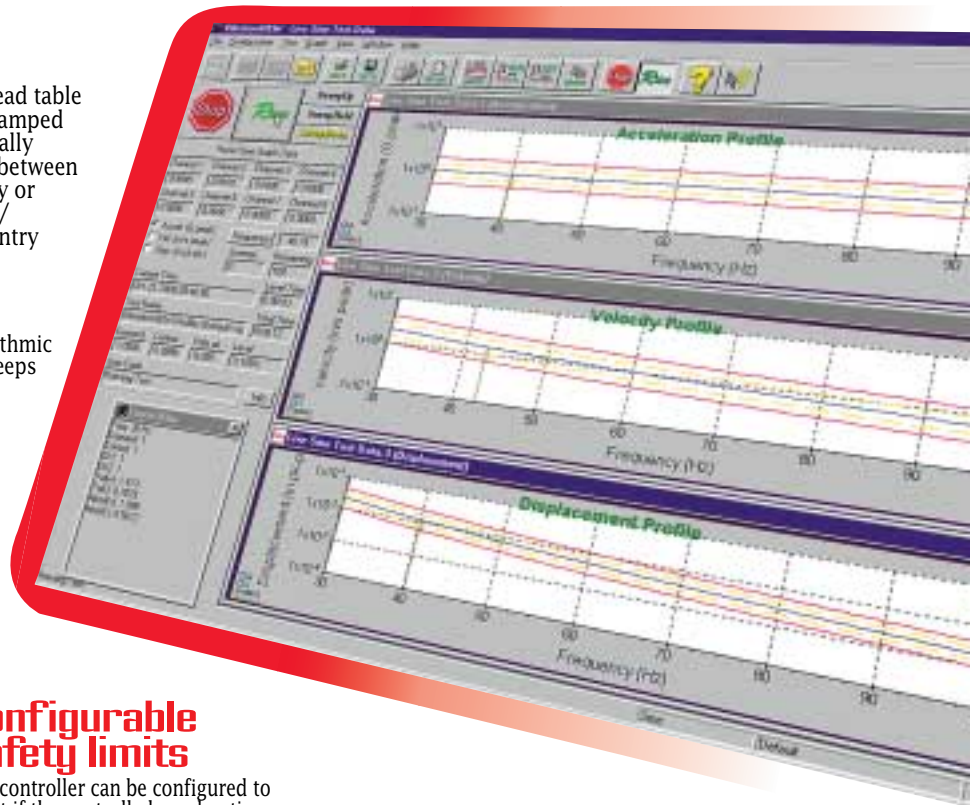
The frequency sweep and amplitude level can be manually controlled through the mouse.

## Reference Output-COLA (Optional) VR 611

The second output channel supplies a 1-volt constant amplitude reference signal. The phase of this signal relative to the main output can be fixed at any phase or set to shift at a configurable rate. This signal may be used to trigger a strobe light or other measurement device requiring triggering lock with the output signal.

## Data plots

A multitude of graphical display options are available, including peak acceleration, peak velocity, peak-to-peak displacement, output drive, channel-to-channel transmissibility and phase as a function of either frequency or time. Graphs can be easily auto-scaled or zoomed and cursors displayed. Data and text annotations can be easily placed on the graphs, with data values updated live as the data changes.





# SINE VIEW

RESONANCE  
SEARCH TRACK  
and DWELL SINE  
TEST MODE (optional)

## 8500 TECHNICAL SPECIFICATIONS

Sine performs closed loop control of swept sine vibration. The digital control algorithm provides time and frequency calculations using floating point math calculations, resulting in frequency changes as small as 1 millionth of a Hertz to produce a smooth and continuous sweep. As fine of resolution as you get with the old analog control systems.

## PARAMETERS

**Frequency range:** DC to 20,000 Hz. Up to 4000 Hz standard; High Frequency Option to extend to 20,000 Hz.

**Dynamic range:** 100 dB typical.

**Loop time:** 2 msec typical.

**Control response time:** 10mS to 10 sec.

**Digital tracking filter:** Proportional from 1% to 100% of output frequency.

**Sweep type and rate:** Linear from zero to 6000 Hz/min or logarithmic from zero to 100 octaves/min.

**Drive frequency resolution:** As fine as 0.000001 Hz.

## PROFILE

User specified table of breakpoints for acceleration, velocity, and displacement segments.

**Breakpoints:** Up to 1000 amplitudes of A, V, or D, constant or slope changes at defined frequencies.

**Abort/alarm:** High and low profile limits specified either universally, or independently at each breakpoint in dB with respect to reference.

**Profile View:** The desired profile is graphed and updated as you build it. The test maximum peak acceleration, peak velocity, and peak to peak displacement values are displayed. Values are highlighted in red if they exceed the shaker parameter values selected.

**Engineering units:** English, SI, Metric, mixed, user defined.

## SCHEDULE

User defined schedule of levels that are automatically performed. Sine resonance table can be defined before the test or during the test.

**Number of levels:** 1000.

**Level types:** Sweep from frequency A to frequency B, sweep back-and-forth through profile, constant frequency, wait for operator intervention, wait for timed interval, resonance table generation & dwell frequency selection (optional), level looping (with nesting up to 10 levels), phase tracking to hold resonance frequency.

**Scheduling level duration types:** Time, sine wave cycles, sweeps.

## SAFETY FEATURES

**Input Signal Checks:** Rapid detection of loss of control signal, input overload, open loop, and other situations requiring a shutdown. Non-control channels can be used with rms monitor limits also.

**Shutdown:** Shutdown can be requested by operator or the program can shut the test down. Shutdown is at a smooth rate. Emergency stop is instantaneous.

**Find the Resonance Points:** Set the test to generate a sweep, and then identify the top 10 resonance points.

**Pick the Resonance Points:** After the resonances are identified, the operator can select which ones to run, and the duration of the test.

**Phase Dwell:** The dwell can be at a constant frequency, or a phase dwell, which shifts the frequency to keep the resonance at a maximum condition, based on the phase between two channels.

STEP TEST  
MODE (optional)

**Frequency stepping test:** Cycle on/off for user-specified time at discrete frequencies. Linear or logarithmic frequency step rates.

**Multi channel notching limits:** Limits profile automatically based.

COLA OUTPUT  
(optional)

**Level:** 1 Volt peak constant amplitude signal.

**Shift:** Operator-controllable phase or frequency shift from output signal's frequency.

DRIVE NOTCHING /  
LIMITING

This option links to all Random and Sine family software to provide additional safety for fragile test articles or components.

The Automatic Drive Notching feature can be used to set acceleration limits on the input channels in any of the Random modules (i.e., Random, SoR, RoR, or SRoR) or the Sine modules (i.e., Swept Sine and RSTD). Any channel can be enabled as a Limit channel. Each limit channel has a corresponding Limit Profile. Both the limit channel input spectrum and Limit Profile can be viewed during a test. If any input channel exceeds its limit during testing, the drive output (at that frequency) will be reduced (notched) until the input channel does not exceed its limit.

*Subject to change without notice.*

8500

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