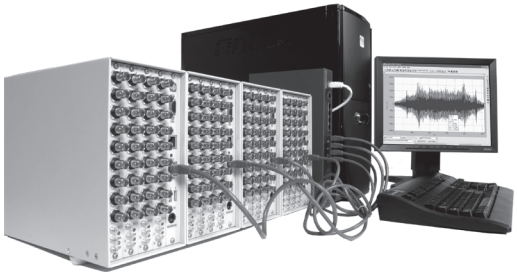
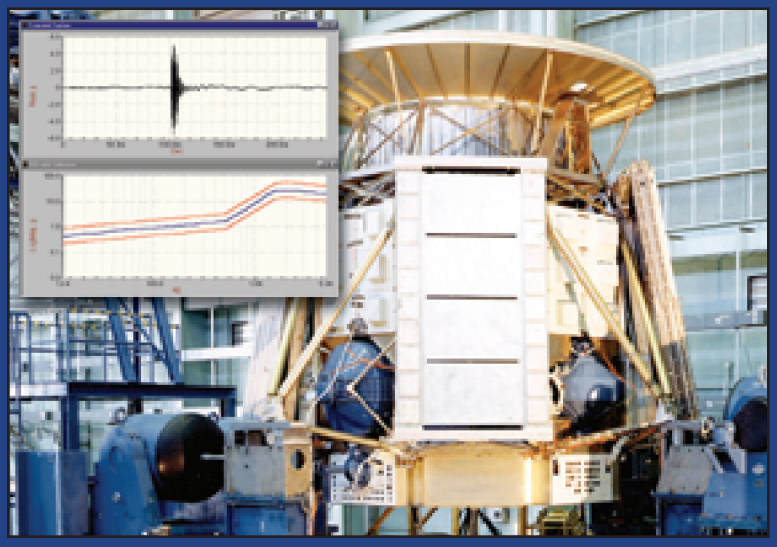
Powerful Software Applications

Environmental Vibration Testing

Engineered for SignalCalc Dynamic Analyzers

Mobilyzer
Savant





Complete Measurement Capability

Simulated vibration environments in the laboratory are used to qualify products during design, to test products against standards, e.g. Mil-std 810 etc., to locate sources of noise, e.g. in squeak and rattle testing and for stress screening, where the failure modes in components are precipitated. SignalCalc analyzers provide a complete measurement capability to support the full range of environmental test applications.

Sine Data Reduction

Sine data reduction is used to measure signals in a sine sweep test under the direction of an external vibration controller. SignalCalc analyzers running sine data reduction may be used as watchdogs on the controller, initiating alarms for the users or aborting a test if specified limits are exceeded. They are also used as a source of extra measurement channels to supplement the controller. The powerful analysis functions and easily customizable graphical user interface features of SignalCalc analyzers enable easy comparison of measurements with those taken by the controller.

Most sine reduction systems detect frequency by sampling a COLA channel. With SignalCalc Sine Reduction, the COLA signal from the controller can be measured both using an input channel and a tachometer channel allowing the frequency to be detected by the tachometer. Because a counter measurement technique using a tachometer is superior, the instantaneous frequency of the COLA channel can be detected with higher accuracy.

The available analysis modes are Average, Peak, RMS, Filter, or DC. Since the analyzer control mode should mirror that in the controller setup, the Sine Reduction software offers Average, RMSAvg, Maximum and Minimum, and Control modes. Control mode applies only when two or more channels are enabled as control. Users may specify different weighting coefficients for the control channels.

For users who wish to analyze only the fundamental but record sufficient high-frequency information to be able to perform higher harmonic analysis later, the software allows selection of the degree of harmonic oversampling required for post-process analysis. Up to 15 harmonics may be analyzed online as well as during playback.

Alarm and Abort Channels

SignalCalc analyzers offer added safety with the intelligent capability of monitoring a sine or random vibration control test from within an external analyzer which may be equipped with several more measurement channels than the controller. Therefore, users have several more channels that could be used to initiate alarms or abort a test when any channel exceeds specified limits.

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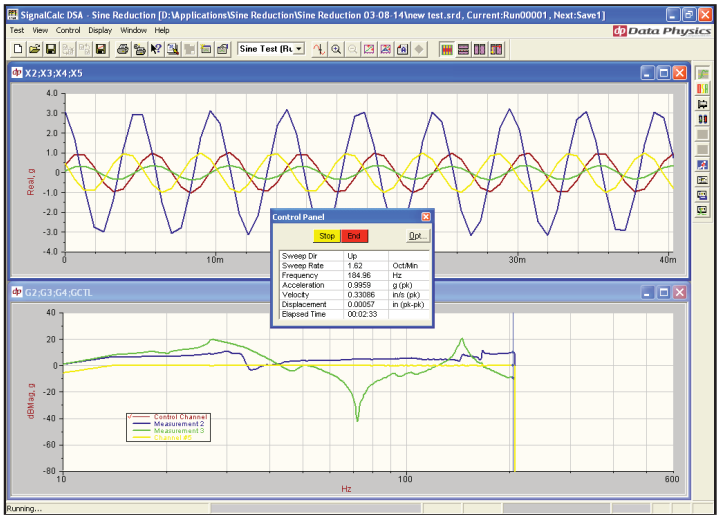

Notching Prediction

Limit channel notching is used to reduce the level of a shaker drive signal in order to keep the vibration levels at a limit channel location within an independent limit profile. The control channel is "notched" automatically to protect a given remote measurement location. SignalCalc analyzers take environmental testing to new heights by providing the capability to predict the nature and amount of notching required. An analyzer can be used to track a low level sine test, and based on levels measured in the various measurement channels the analyzer then predicts the notching required for a full level test.

SRS Analysis

SRS Analysis provides a special type of proportional-bandwidth spectral measurement for transient signals. Each frequency point of a Shock Response Spectrum is the peak response of a second-order filter excited by the input. Each of these filters simulates a base-excited single degree-of-freedom (SDOF) mechanical system. The natural frequencies of these systems are distributed in an 1/Nth Octave manner (with resolution choice of full Octave to 1/24th Octave) and their equivalent viscous damping factor may be selected to be anywhere between 0.01 and 100 percent of critical damping.

This type of spectrum analysis is normally applied to transient earth-motion measurements (or their simulation) to ascertain the survivability of civil structures and critical equipment subject to seismic excitation.

A single signal, capture online, may be analyzed multiple times using different damping factors, spectral resolution and filter placement, as desired. Shock Response Spectrum analysis may also be used to analyze recordings made with the Throughput-to-Disk option, providing test engineers with a very flexible and efficient platform for detailed engineering analysis.

Drop Testing

Drop tests have been commonly used for product fragility assessment, prototype testing, package and cushion evaluation, and compliance with military standards. Working with drop shock facilities, Drop Test provides the user with the ability to capture and display the drop waveforms and perform "Fairing" (or filtering) on the waveforms to better understand and meet the drop test requirements.

Drop Test is an ActiveX implementation created in Visual Basic. Using ActiveX controls, the Drop Test interface launches the any one of the SignalCalc analyzers, sets test parameters, starts and reads measurements performed by the analyzer, and performs special calculations to provide the desired signals for drop testing. These calculated signals are then displayed in the analyzer. This implementation highlights two very important aspects of SignalCalc analyzers. First, their operation can be completely controlled and/or automated from an external windows environment, and second, the incredibly precise measurements available in them can be used to provide the backbone for a multitude of specialized, application specific tests.

In many situations, users will perform Fairing calculations in conjunction with Shock Response Spectrum calculations on the captured waveform. This combination, elegantly offered in a single interface, allows the user to properly evaluate the damage potential associated with the captured drop waveform in both the time and frequency domains. The user can also choose to recalculate the captured waveform using different Fairing parameters and/or different SRS parameters. This feature allows the user to capture a waveform and then try different Fairing and/or SRS parameter values without having to recapture another waveform.

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