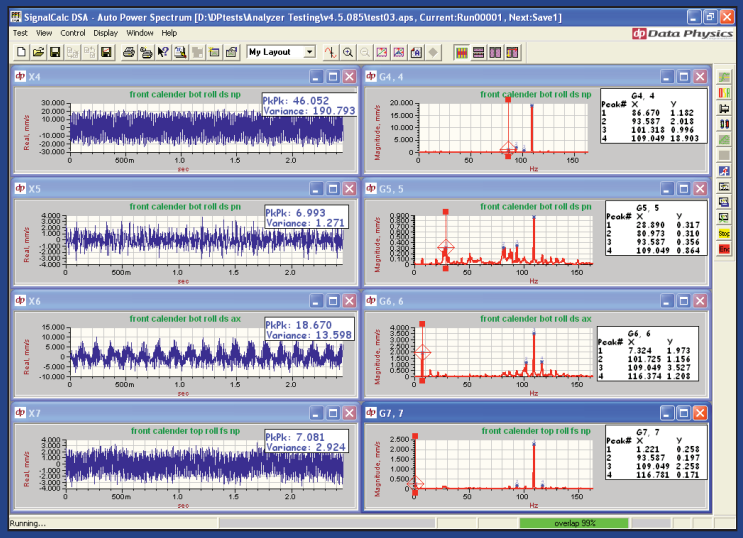
Powerful Software Applications

General FFT Analysis

Engineered for SignalCalc Dynamic Analyzers

- ACE
- Mobilyzer
- Savant



Powerful and Efficient Measurements

SignalCalc Dynamic Signal Analyzers provide a powerful range of functions for fast, accurate and easy to use time and frequency domain measurements. The standard software offers a comprehensive set of measurements including time domain acquisition, transient capture, linear spectra, auto power spectra, magnitude spectra, synchronous average, power spectral density, transfer function, coherence, rpm spectra, correlation, histogram, probability distribution and probability density.

Auto Power Spectrum (APS)

The APS suite is the most widely applied measurement environment by SignalCalc users. Analysis of the last time histories, last linear spectra, last auto power spectra and average auto power spectra can all be made simultaneously in realtime. This measurement mode supports rectangular, flat top, Hann and Hamming window choices for minimization of spectral leakage.

Transfer Function

Transfer function measurements, also called Frequency Response Functions (FRFs) extend the above capabilities by providing cross spectral measurements between all channels and a specified reference channel. Two estimates of the transfer function are provided, Hxy (sensitive to noise on input) and H2yx (sensitive to noise on output). Coherence and impulse response function measurements are also available, making the SignalCalc family of analyzers the complete solution for modal analysis applications.

Transfer function measurements offer force and response window choices in addition to those offered in the APS measurement. Frequency response functions may be directly exported to a variety of commercially available modal analysis packages in their native formats.

Synchronous Average

Synchronous averaging extends APS measurement by providing the ability to average the time histories and linear spectra on all channels. To facilitate this measurement, a variety of acquisition triggers are available: input channel, external positive or negative and tachometer triggers all provide the ability to remove the contribution of asynchronous signal content in a time or spectral average, thereby isolating the contribution of synchronous signal components. This measurement is most commonly used in rotating machinery analysis, where the unique tachometer trigger circuitry and logic provide jitter free triggering.

A major distinguishing feature of this measurement suite is the ability to analyze the overall or total auto power spectra averages on all signals simultaneously along with the synchronous or linear averaged spectra.

Correlation

Cross correlation analysis is used to quantify the degree of similarity between two signals and determine the direction of propagation of random variations, while auto correlation measurements are used to determine if any periodicity exists in seemingly random signals. The Linear correlation method is used for the correlation of random or transient signals, while the Circular method is applied when correlating periodic signals. The software allows computation of normalized (non-dimensional, bounded between ± 1) correlation coefficients which makes it easier for the comparison of different correlation results. The user is offered a choice to remove the mean value before correlation, which is particularly useful when correlation signals contain a large DC component.

Random variations generally manifest themselves in very low frequency ranges. Therefore, if two signals contain relatively high amplitude and dissimilar high frequency periodic components, but similar low frequency random parts, the correlation results will be much poorer than the user may expect. SignalCalc analyzers provide highly customizable low pass, high pass, band pass and band reject filters which can be used to obtain better measurements for a variety of applications. An infinite number of filters may be defined by the user, each easily invoked by a simple interface which is part of the channel input table.

Histogram

SignalCalc analyzers provide a powerful set of statistical measurements including Histogram, Probability Density and Cumulative Distribution measurements. This function is often used to drive shakers in environmental testing. The Gaussian Goodness display, which shows the logarithm of the Probability Density p(x) versus the square of sigma, is a particularly good way to assess the effectiveness of crest factor (peak to rms ratio) in vibration control applications.

Realtime Zoom and High Resolution

Normal frequency domain measurements place the available lines from DC to the full analysis frequency range. Realtime zoom concentrates the same number of lines of measurement over a narrow frequency band resulting in much higher resolution. Zoom can be used to resolve closely spaced modes, improve coherence, or accurately identify frequencies of sinusoids. Users specify a center frequency and zoom bandwidth. Since the center frequency may be arbitrarily specified, this is an excellent way to cause a particular measured frequency to fall exactly on a line.

For measurements where the user simply needs high resolution, SignalCalc analyzers provide up to 25,600 lines of resolution.

Transducer Calibration

SignalCalc analyzers perform transducer sensitivity measurements on command, automatically transferring the resulting sensitivities to a current Test Setup enabling calibration against a known transducer input. Calibration data, once measured, is available for future tests until updated by re-calibration. Calibration also creates a summary text file which records the user input calibrator and sensor information as well as the measured calibration frequency and sensitivity, allowing test engineers complete traceability for ISO and other certification requirements.

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