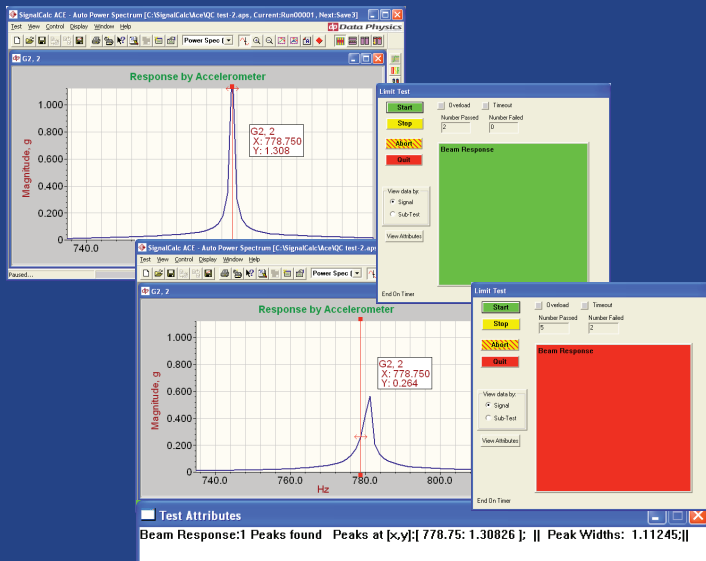


Production Testing and Condition Monitoring

Engineered for SignalCalc Dynamic Analyzers

- ACE
- Mobilizer
- Savant



Production Testing and Condition Monitoring

SignalCalc analyzers go far beyond the traditional confines of sound and vibration testing. The incredible computational power and diverse measurement capabilities of these instruments make them ideally suited for a variety of production test applications where automated quality control is required, as well as process and machine condition monitoring, where a variety of parameters need monitoring in order to predict or understand component failure and system upsets.

Quality Control

Parameters such as surface finish, dimensions and various forms of non-destructive testing such as ultrasonic inspection are usually adequate for quality control of parts making up a larger system. Controlling the quality of complete systems and complex electronic components requires more evolved methods involving noise and vibration measurement during operational testing. This is particularly true when the satisfactory response of a system to some external stimulus maybe critical in order for it to be accepted. SignalCalc QC delivers advanced quality control tools that use any of the powerful measurement capabilities of the SignalCalc Dynamic Signal Analyzer family. For instance, the QC package may use the magnitude of a transfer function computation between input force and response acceleration to enable pass/fail testing. A common application is one where the Demodulation suite is used to ensure that no significant amplitude and/or phase modulation exists when a gear box is operated at maximum rated load.

Flexible and Rapid Tolerance Limit Development

SignalCalc QC provides two convenient methods of establishing comparisons between "good" and "bad" test items. The first

method involves comparing a measured signal against upper and/or lower limit signals previously defined by the user. The second method involves comparing the statistics on a given signal (RMS, Max, Min, peak to peak or average) against scalar limits. For quality control applications involving impact testing, as is often done on turbine blades, users may test the response signal(s) following a hammer impact for natural frequencies and damping characteristics. SignalCalc QC uses User Signals for signal comparison. **User signals** may consist of base signals in the analyzer SignalMap, previously measured signals or signals imported in the form of ASCII text files. Limit signals can then be easily created with reference to any of the user signals defined. You may make this signal a number of dB greater or smaller than the existing signal, make it a % larger or smaller than the current signal, or increase or decrease the existing signal by a number of engineering units. Editing of limit signals by the user is made just as easy by allowing any given limit signal being displayed in the analyzer to be manually selected and "dragged" and redrawn to different amplitudes or spectral widths. SignalCalc QC Advanced option makes the complex task of assigning appropriate limits for a given test simple yet sophisticated. Using this feature, users may select one or more signals for statistical evaluation of their individual signal statistics, which are also definable.

The program then "trains" itself to establish appropriate limits for a given type of test by evaluating a number of pre-tests. Users may of course, modify the recommended statistical limits once an initial idea is obtained by this powerful option.

Test Sequencing and Automation

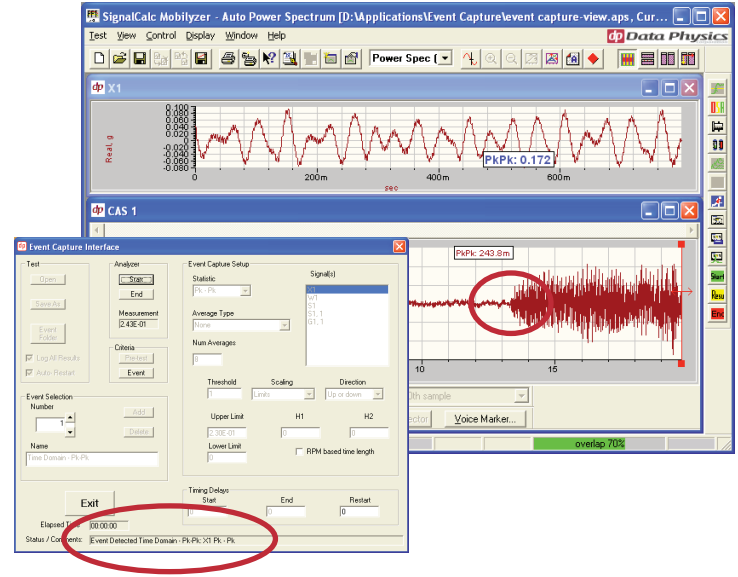
SignalCalc QC allows you the ability to design up to 32 different tests to be performed simultaneously. It is therefore possible to break a test up into a number of sub-tests. With this method, an overall pass/fail, or the pass/fail status of each sub-test may be reported. Using Boolean arithmetic and the sub-test feature, you can establish conditional Pass/Fail criteria. The SignalCalc QC program can also communicate with PLCs and other external platforms via an RS-232 interface. The system may also be configured with a switch closure output capability using either an ISA, PCI or USB relay card. Messages indicating a product passing or failing can therefore be easily transmitted to company wide systems, and a variety of production line systems may be actuated or stopped following a certain relay state being set.

Event Capture

Event Capture enables data recording control and automation using the powerful signal processing functions of the analyzers and a variety of statistical calculations for each signal in the SignalMap.

Event Definition

Event Capture offers complete flexibility and control over the definition of "events." Time and frequency domain signals, including frequency response functions, may be used to characterize the nature of a given process. Event Parameters include absolute levels being exceeded, % or dB change in a signal or statistical σ limits (RMS or peak). Additionally, the level that triggers an event may be averaged using exponential, peak or stable averaging. The frequency domain peak amplitude between specified frequencies or even RPM based limits may be used to define events, making this utility unmatched in its ability to truly identify complex problems and record raw data for further analysis. When statistical limits on selected signals are exceeded, the data available in the circular recording buffer is written to the hard disk. The program can be set to re-arm itself and go back into surveillance mode, waiting for the next event or stop. The auto restart feature is particular useful for continuous monitoring applications, where a process or machine may be monitored round the clock, with raw data following the occurrence of undesirable operational conditions available for offline analysis. A manual restart is also available.



Capturing an Event

Advanced Trigger/Record Controls

Users may specify the amount of pre-trigger delay prior to an event for the recording, or even define the minimum length of data capture following the triggering of an event. A convenient auto-start test allows users to wait until specified start criteria are sensed before auto-starting the event detection process. Finally, the system may be instructed to ignore isolated events and capture only repeated events, eliminating false triggers.

Event Capture brings to process and condition monitoring the ability to harness simultaneous multi-channel signal processing, highly evolved statistical definitions of event triggers, robust data recording along with the high sampling rates and unmatched dynamic range of SignalCalc analyzers - all in one easy to use package.