Data Sheet

SYNOPSYS®

Saber Scope

Mixed-signal Graphical Waveform Analyzer

Overview

Simulators are powerful tools in design, but they can generate so much data that critical information you need can become elusive. Your challenge is to evaluate the design and get important information quickly and accurately. In analog design, it's vitally important to visualize these results and manipulate them in numerical or graphical form. In the past, many waveform viewers made it a chore to graph data in a meaningful way, making it difficult to do all the analysis you need.

Before creating the Saber® Scope Graphical Waveform Analyzer, Synopsys invited designers to write their wish lists for a next-generation waveform analysis product. Synopsys then had designers evaluate Saber Scope repeatedly over an 18-month period. The result is the industry's premier product for graphical waveform analysis of analog and mixed-signal design.

Benefits

- Perform post-processing of analog and digital simulation results
- Automatically annotates graphs with design information–with true WYSIWYG graphics, including arrows, shapes and text.
- Annotate graphs with 50 types of measurements for immediate visual feedback on your design's performance.
- Save and restore graphs for further editing–entire Saber Scope session can be saved and restored, letting you pick up where you left off.
- Streamline designs through Saber Scope's tight integration with Synopsys' Saber® Designer family and third party design frameworks. As an introduction to Saber Scope, the following takes you through the steps of a brief, yet typical, session.

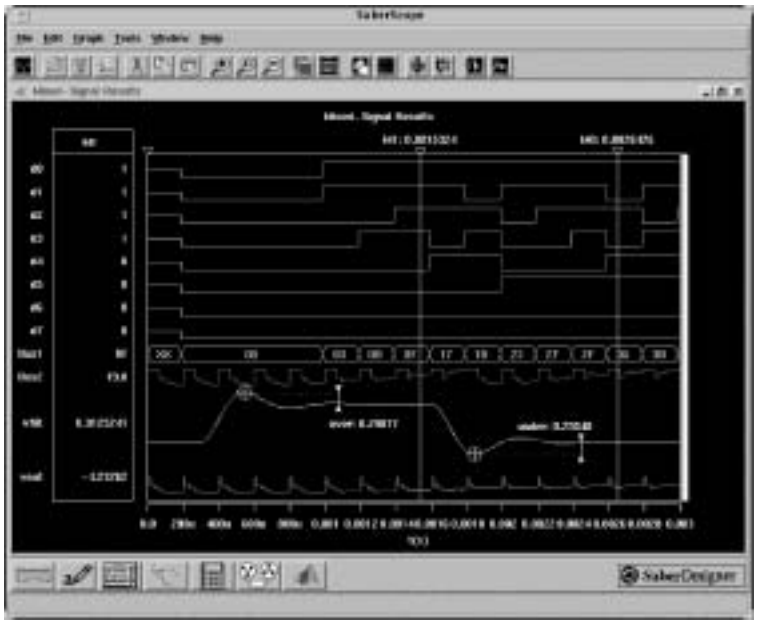
Begin with Signal Manager

A Saber Scope session typically begins when you select signals for graphing and analysis. Saber Scope's Signal Manager lets you start your work by helping you navigate simulation output files. The Signal Manager lists signal names with indentation to indicate the design's hierarchy. You can easily double-click on signal names to expand or collapse lists of lower-level signals—particularly helpful in IC or system designs that can have hundreds of signals. You can filter the list to show only signals with units of voltage, current, torque, etc.

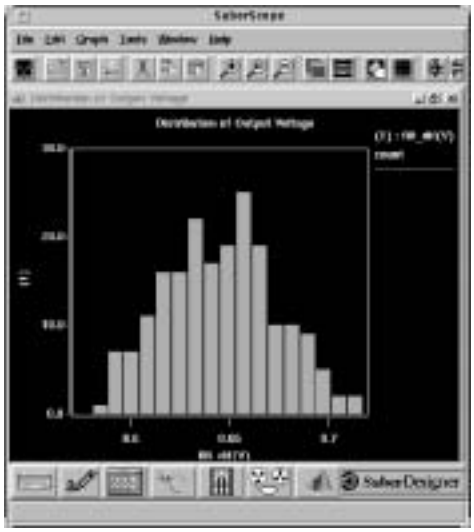
The Signal Manager makes it easy to open multiple output files so that you can compare results generated in different sessions.

Graphing Signals

For analysis of simulation results, you can choose from a wide variety of graph display formats to suit your needs. When viewing analysis in the frequency domain, you can easily switch between Bode, Nichols and Nyquist diagrams. Graphs automatically display signals' units, including electrical, mechanical, hydraulic, etc. Viewing analysis in the time domain can be done using analog graph views, or trace views for looking at a large number of digital, analog and mixed-signal results in a stripchart-like trace window.



Saber Scope results.



Saber Scope can display, graphically, the results from Monte Carlo simulations to show effects of component variation.

Compared to other analog waveform viewers, Saber Scope offers greater flexibility in viewing digital waveforms. Signals can be displayed as bits, buses or registers in binary, octal, decimal, hexadecimal or floating point representations. Buses can be viewed in typical timing diagram format or can be shown as a "stepped' waveform—useful when you want to view a bus or register value as an integer—when comparing the digital input to a digital-to-analog converter with its analog output signal.

Saber Scope also makes it easy to look at the results of analysis that generate multiple runs, such as Monte Carlo analysis or parametric variation analysis available in the InSpecs® family of products. Just select the name of the signal, bring up the pop-up menu and then choose whether you want to look at multiple or individual runs. Each curve is automatically annotated with parameter values.

Interactive, Graphical Measurement

Displaying simulation waveforms is just the beginning of analyzing your design. You want to know whether your design met specifications. Was the rise time fast enough? Was the overshoot too high? Saber Scope's Measurement tool lets you quickly select a signal and perform one of over 50 analysis on it. Saber Scope is unique because the Measurement Tool is fully graphical and interactive. The result of the measurement is annotated directly onto the diagram. You can even see the cross hairs indicating where the measurements was applied. You can also interact with a measurement by double clicking on it. For example, you could rapidly change the rise time measurement from 10-90% to 20-80%.

Measurements can also be used to generate new waveforms. For instance, if you want to see a plot of how a voltage-controlled oscillator's output frequency changes as a function of input voltage, you can measure the frequency of the VCO output and automatically produce a graph of output frequency vs. input voltage. In turn, you can measure the slope of this signal.

Waveform Calculator

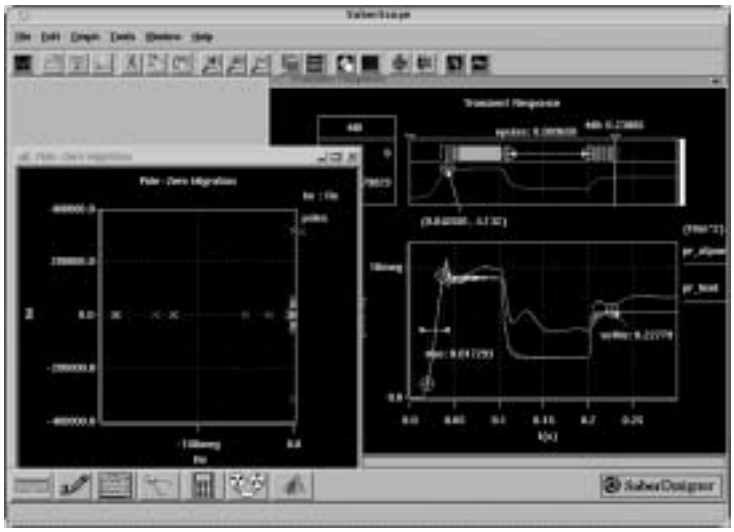
Synopsys' Waveform Calculator tool allows you to quickly specify whether you want to use algebraic notation or RPN with the click of a button. You can select signals from the Signal Manager or any graph and paste their names into the registers of the Waveform Calculator. The keyboard of the calculator lets you enter numerical values or perform operations on the signals. With the Waveform Calculator, you can:

- Build complex expressions interactively.
- Use over 70 different mathematical functions, including logical operations on digital waveforms.
- Easily store expressions for later use.
- Program the calculator to include any number of expressions.
- Graph waveforms directly from the calculator.

Tailor Graphs to Complement Your Individual Style

You've created your graphs, done your calculations, and now want to take care of the fine points. Saber Scope lets you modify the axis labels—including the color and font of the text—plus, change the color and style of the curves on the graphs and move the graph legend. To edit any label in Saber Scope, simply point the cursor where you want to insert text and start typing—you don't need to go to a form.

Saber Scope's Draw tool enables you to annotate graphs with freeform text, arrows, lines, and squares so you can draw attention to your findings. You can even add bitmap images, like your company's logo, to your graph. And with "text variables", Saber Scope will automatically annotate predefined fields onto graphs, such as your name, or time & date stamps.



Saber Scope offers unparalleled ease-of-use in measuring results and annotating the measurements on the graph.

Time:
Falltime, Risetime, Slew rate, Period, Frequency, Duty cycle, Pulse width, Delay, Overshoot, Undershoot, Settle time

Frequency:
Lowpass, Highpass, Bandpass, Stopband, Gain margin, Phase margin, Slope

Statistics:
Maximum, Minimum, Range, Mean, Median, Standard Deviation, Mean + 3 standard deviation, Mean – 3 standard deviations, Histogram, Yield, Dpu, Cpk

Levels:
X at Maximum, X at Minimum, Peak to Peak, Topline, Baseline, Amplitude, Average, RMS, AC Coupled RMS

General:
At X value, at Y value, Delta X, Delta Y, Length, Slope, Local Max/Min, Crossing, Horizontal level, Vertical level, Point marker

Measurements available in Saber Scope.

Flexible Printing

Saber Scope gives you flexibility in printing. Page layout forms help you specify paper size and graph alignment, letting you create oversize graphs spanning several pages. You can print using popular file formats, including PostScript®, PCL5 and HPGL2. You can also export using popular office automation formats including JPEG, GIF, and TIFF, MIF, for inclusion in documents or presentations.

Save Time with Advanced Save and Restore

With most waveform analysis products, each time you begin a session you must start from scratch, spending valuable time searching for data files, rearranging windows, etc.

Saber Scope, however, lets you save an entire session. Arrangements of windows, complete graphs, open plot files, calculator contents and macros, etc. can be restored from your last session, allowing you to continue your work without interruption. Saber Scope also gives you two other options for saving your work. After you create a graph, Saber Scope lets you save any number of graphs, complete with annotations, text variables and measurements. Then, in a later session, you can quickly restore a graph, modify it, or use it as the basis for a new graph. Also, during a design cycle you may want to define a standard set of graphs and measurements you would like repeated. For this purpose, Saber Scope incorporates graph outlines that let you save axis range labels, annotations, text variables and measurements to new sets of waveforms.

Design Process Integration

You can run Saber Scope by itself as a post-processing tool, or as an integrated member of the Saber Designer design suite. It runs seamlessly within Saber® Guide or can be invoked from the design editor Saber® Sketch, and Frameway™ Integrations.

Integration between Saber Designer applications is natural. You can cross-probe from the Synopsys framework design by selecting a net on the design and viewing the corresponding waveform in Saber Scope. Drawings, annotations and symbols can be freely copied and pasted between Saber Designer applications.

Saber Scope also has a waveform reader API (applications programming interface) which allows a 3rd party to integrate Saber Scope to be used to read results from other simulation products. This means that a design team can have a single waveform analysis tool for all their simulation results, minimizing training and support costs.

Platform Support

- Popular Unix
- Linux
- Windows Platforms Supported

For more information about Synopsys products, support services or training, visit us on the web at www.synopsys.com, contact your local sales representative or call 650.584.5000.

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