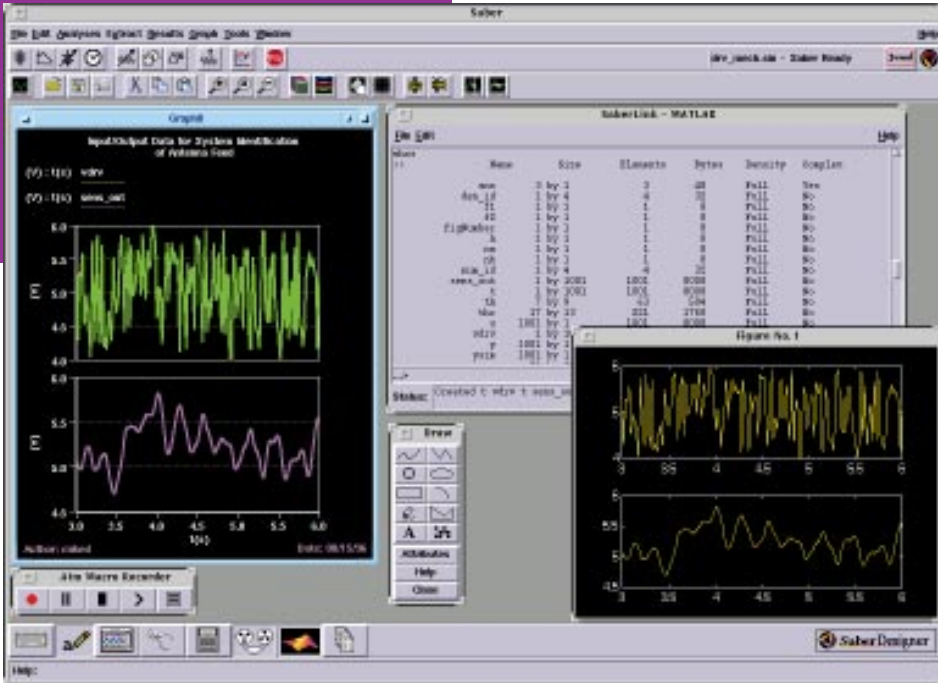


SaberLink™

Analysis Interface to MATLAB®



- Seamless integration of MATLAB into SaberDesigner™ environment
- Perform advanced control system design, DSP design and system identification within SaberScope™ or SaberGuide™
- Interactive, two-way interchange of simulation results and matrix data
- Provides direct access to MATLAB command line

Overview

The Saber® simulator has set the standard for simulation of mixed-signal and mixed-technology designs. However, many of today's advanced designs are first evaluated and specified using higher-level, mathematically-based modeling and simulation products, such as the MATLAB technical computing environment and SIMULINK simulation environment from The MathWorks, Inc. SaberLink accelerates top-down design by linking SaberDesigner to MATLAB/SIMULINK.

Now, it's easier to leverage Saber's superior mixed-signal and mixed-technology simulation capabilities with SIMULINK's strengths in control system modeling and simulation. Combining these strengths allows design teams to work together more effectively, resulting in faster times-to-market.

MATLAB — Industry Leader in Engineering Analysis

In industry and education, MATLAB has become the *de facto* standard for numeric computation and visualization.

MATLAB is used for researching and solving practical engineering and mathematical problems in uses that include:

- General purpose numeric computation
- Algorithm prototyping
- Special purpose problem solving in automatic control theory, statistics and digital signal processing
- Data visualization in a wide range of disciplines using 2-D and 3-D graphics

Using MATLAB in SaberDesigner

With SaberLink, a MATLAB button appears in the SaberDesigner application tool bar, like the Waveform Calculator or Signal Manager. To access SaberLink, click on the MATLAB icon. This automatically invokes MATLAB. A new window appears within the SaberDesigner application containing a command line for direct entry of MATLAB commands in native syntax. A scrollable window allows viewing of previously entered MATLAB commands or the output from the MATLAB session. A SaberLink status window notes operations being performed through the interface.

SaberLink allows data to be transferred between a SaberGuide or SaberScope session and MATLAB. To do this, select a variable in MATLAB and paste it in a SaberScope graph window or the SaberDesigner application's AIM command tool.

To transfer data from SaberScope to MATLAB, simply use the mouse cursor to select a waveform in a graph window and paste it in the MATLAB window by clicking with the middle mouse button.

Valuable information can be transferred between MATLAB and the SaberDesigner application, including:

Saber simulation results in time domain or frequency domain —

This allows input/output data from a circuit simulation to be transferred. Using MATLAB's System Identification capabilities, a behavioral model, such as a transfer function, can be generated from that data. Other benefits include

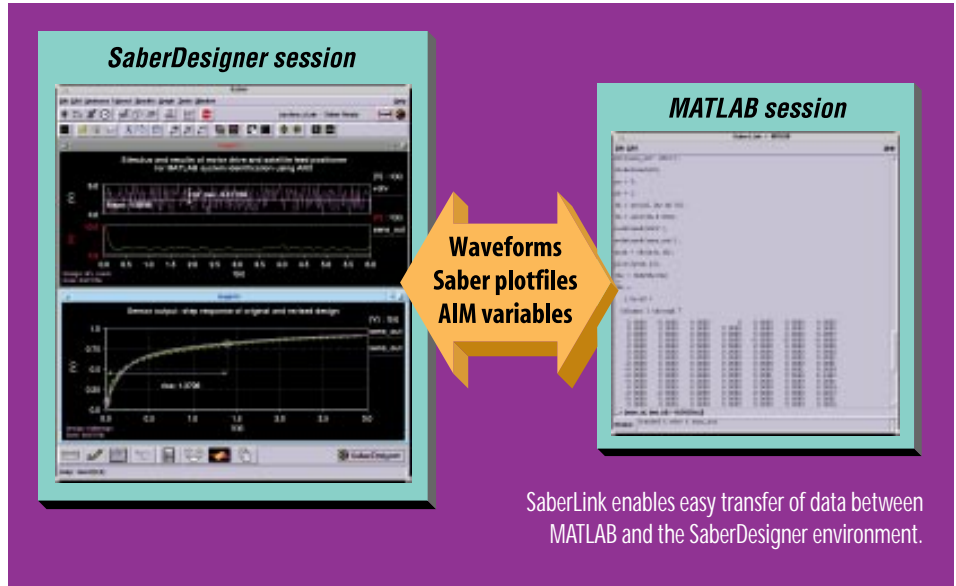
the ability to perform advanced signal processing and higher order spectral analysis on Saber data in MATLAB.

MATLAB matrix data and SIMULINK simulation outputs — Benefits include easy comparison of MATLAB and Saber results and the ability to analyze MATLAB data via waveform post-processing in SaberScope. MATLAB data can also be used to set Saber template parameters.

Automated Tasks Through Unified Scripting

All of Analog's SaberDesigner products are based on the AIM scripting language. All operations performed through its graphical user interface are executed as AIM commands. Using its integral Macro Recorder, scripts can be easily captured from an interactive session. Through SaberLink, SaberDesigner operations and MATLAB commands can

be logged into a single, merged script that can be rerun in later sessions. This enables the ability to quickly automate sequences of tasks involving both Saber and MATLAB.



SaberLink enables easy transfer of data between MATLAB and the SaberDesigner environment.

Applications

SaberLink opens up a wide range of applications for Saber users who are familiar with MATLAB. Once Saber simulation results are transferred to MATLAB, the full power of those products can be used to perform further analysis and design.

Digital Filter Design

When using Saber to analyze a system requiring a digital filter, results of the Saber analyses can be transferred to MATLAB. Signal processing features can be used to perform spectral analysis on Saber time-domain or frequency-domain simulation results. MATLAB can also be used to compute filter coefficients for an IIR or FIR filter. If a digital filter is added to the Saber schematic, SaberLink can be used to copy the filter coefficients. As the design is tuned, SaberLink allows the creation and running of macros that automate design iteration. Results come quicker.

Stimulus Creation in MATLAB

A script in MATLAB can be run to generate an array of time points. Next, a combination of various sinusoidal

components is created. This can yield, for example, a fairly complex stimulus to a communications circuit. The resulting array can then be written to a plotfile and be connected to a Saber design as stimulus.

Design Tuning

A script can be developed to run a Saber simulation. Results would then be transferred to MATLAB for evaluation. The design can be altered in Saber and iterated upon until performance characteristics are achieved. Waveforms from MATLAB can be easily imported into SaberScope, where they can be compared from the different simulation runs. Alternatively, simulation results can be exported from Saber to MATLAB for manipulation.

Other Uses of the SaberLink Interface:

- Advanced Signal Processing
- Classical or Modern Control System Design
- Systems Identification
- 3-D Graphing of Saber Results in MATLAB

Ordering Information

SaberLink	Part No. - AS03
Prerequisite: SaberScope	Part No. - AA02
Required from The Mathworks, Inc.:	
• MATLAB 4.2 or higher	
Recommended:	
Saber Simulator	Part No. - AA02
Analog Model Synthesis	Part No. - AM09
Saber Spectral Option	Part No. - AA03
InSpecs Professional	Part No. - AA11
Linear Systems Analysis	Part No. - AA12
Supported Platforms:	
• HP700 with HP-UX 9.01 through 10.03	
• Sun Solaris 2.4 and 2.5	



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