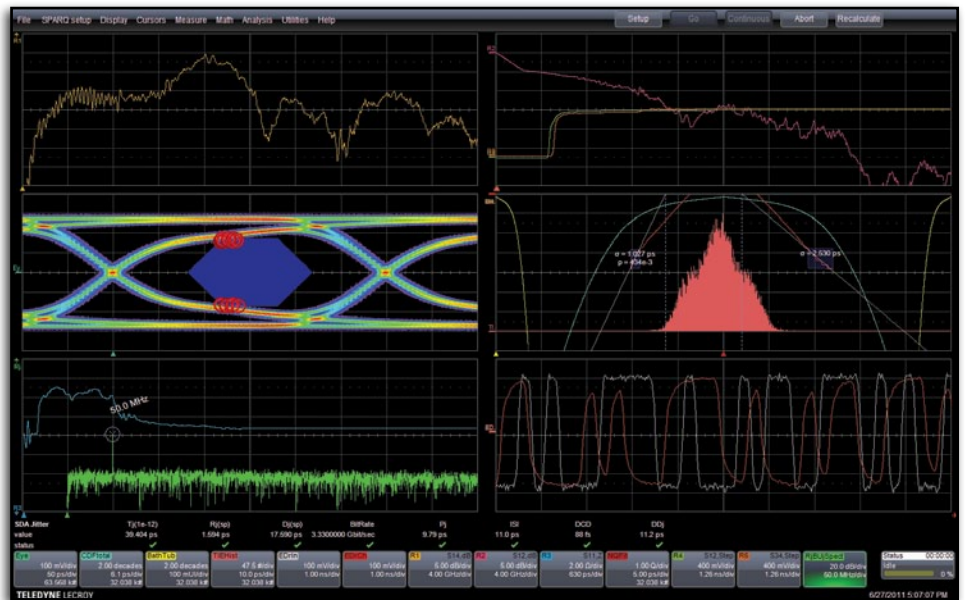# TELEDYNE LECROY
Everywhere**you**look™

Signal Integrity Studio

Key Features

- **Seamless integration with Teledyne LeCroy SPARQ™ S-parameter measurements**

- **Full signal integrity analysis of equalized receiver signal**

- **Fast eye diagramming**

- **Advanced jitter analysis**

- **Co-simulation of measured and/or modeled network characteristics**

- **De-embedding and emulation of channel and fixture responses**

- **Emulation of CTLE, DFE & FFE equalizers and PLL**

- **Available as standalone software with USB license key or as an option installed on a Teledyne LeCroy SPARQ**

Signal Integrity Studio enhances the modeling and simulation capabilities of the Teledyne LeCroy SPARQ application, adding eye and jitter measurements.

End-to-end Signal Integrity Workstation

Signal Integrity Studio combines S-parameter measurements, channel and equalizer modeling and eye diagramming and jitter analysis in a single affordable software package. "SI Studio" is available as a standalone version or as an option for a Teledyne LeCroy SPARQ series network analyzer.

With Signal Integrity Studio, users analyze the effects that impedance mismatches, losses, emphasis and equalization choices have on signal integrity characteristics of a device under test. S-parameters measured from an imported Touchstone file are used to emulate or de-embed a channel. Models for emphasis and equalization and a simulated waveform are configured by the user, and the resulting eye diagram can be viewed and analyzed to provide insight into the eye closure and jitter characteristics of the DUT and receiver design.

teledynelecroy.com/sistudio

FROM MEASUREMENT TO SIMULATION

See Effects of Measured S-parameters Immediately

Signal Integrity Studio works seamlessly with the SPARQ Series Signal Integrity Network Analyzers. S-parameters measured live by the SPARQ link directly to user's configuration for channel and fixture emulation or de-embedding configuration. As the SPARQ acquires new S-parameters, the application rapidly shows the affect of the newly acquired measurements. The SPARQ measures 40 GHz S-parameters with single button press operation at a fraction of the price of a VNA, and is available in 2, 4, 8- and 12-port versions.
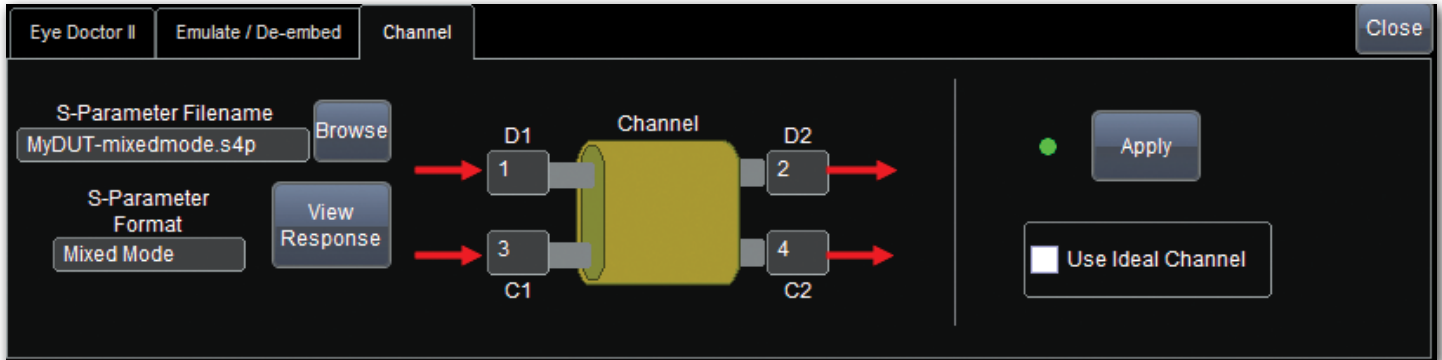
Channels are de-embedded or emulated using either modeled or measured S-parameters.

Simulate Serial Data Patterns with Impairments

Signal Integrity Studio analysis begins with a long serial data pattern output from the built-in simulator. Serial data waveform types include NRZ, RZ, bpNZ and clock. Impairments such as vertical noise, horizontal jitter, overshoot/undershoot, periodic jitter aggressors and ISI can be configured. Waveforms previously saved on Teledyne LeCroy oscilloscopes can be used as a signal source.

SI Studio utilizes a versatile built-in simulator as a signal source

## Seamless Integration with Teledyne LeCroy SPARQ

SI Studio is available as a software option for the Teledyne LeCroy SPARQ. Purchase SPARQ-SISTUDIO along with your SPARQ to give all users who connect to the SPARQ access to Signal Integrity Studio capabilities. When connected to a SPARQ that includes the SI STUDIO option, S-parameters can be measured and immediately used in simulations to study the signal integrity characteristics of a device under test.

Signal Integrity Studio integrates seamlessly with the Teledyne LeCroy SPARQ, providing measurement, modeling and simulation in a single software package.

Determine Optimal Equalizer Settings

Users can open up closed eyes via a simple GUI for configuring pre-emphasis, de-emphasis, continuous time linear equalization (CTLE), feed forward equalization (FFE) or decision feedback equalization (DFE) filters, and standard or customizable PLL settings. Users can configure settings manually, or allow the software to configure automatically.
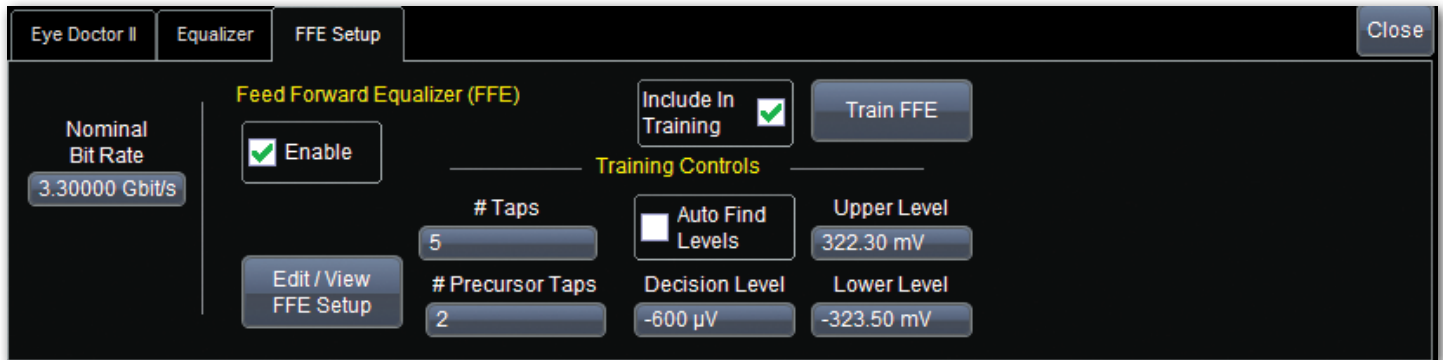

Equalizer and pre/de-emphasis (not shown) are easily modeled via SI Studio's "EyeDoctor II" dialogs.

Rapidly Measure Eye Diagrams

The equalized signal is rapidly sliced into component unit intervals and an eye diagram created that is available for analysis. Users can display up to 11 eye diagram measurements, and perform mask testing to determine if the channel and equalizer settings result in a compliant eye.

Analyze Jitter in Time and Frequency Domains

Signal Integrity Studio has >15 views of jitter to give insight into the affects of jitter aggressors and consequences of signal integrity issues in the design of the channel and equalizer. Jitter analysis includes standard Tj, Rj and Dj dual-dirac model measurements, jitter spectrum, jitter histogram and more.
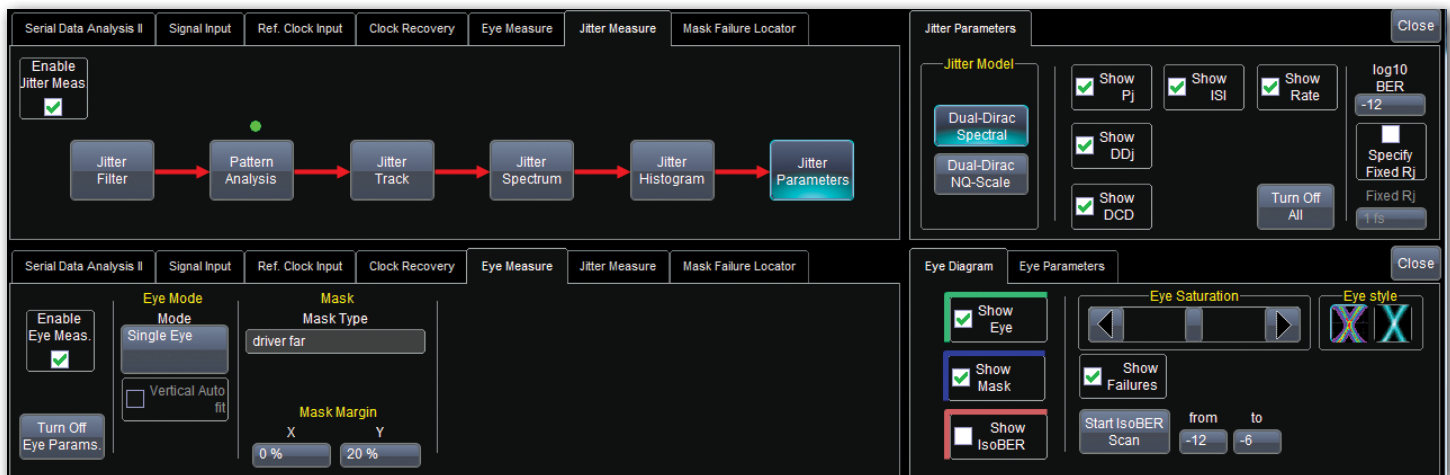
A rich set of jitter and eye diagram analysis tools yield deep insight signal integrity issues of the device under test.

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ORDERING INFORMATION AND FEATURES

Standalone Operation

Customers who purchase either SPARQ-SISTUDIO or SISTUDIO can access Signal Integrity Studio capabilities via a USB license key that ships with each order. Users can make measurements with the SPARQ, and then use the application software with its Studio features while "untethered" from the SPARQ. This mode of operation allows users to recalculate their S-parameters and re-analyze eye and jitter characteristics without the SPARQ hardware. Standalone operation is a new feature, released with SPARQ software version 6.5.0.5.

Ordering Information

Product Description	Product Code
Signal Integrity Studio, Standalone version	SISTUDIO
Signal Integrity Studio Option for Teledyne LeCroy SPARQ	SPARQ-SISTUDIO

(Both products ship with a USB license key for standalone operation)

Features

Simulator			
Signal Type	**Serial Data:** NRZ, RZ, bpNZ and clock		
Signal Characteristics	Frequency, Amplitude, Risetime, Overshoot, Undershoot, Spike, Vertical Noise, Horizontal jitter, Periodic Jitter, ISI		
Emphasis	Pre-emphasis or De-emphasis, Auto-add, Auto-remove, Custom setting of up to 8 taps		
De-embedding / Emulation	Emulate or De-embed channel using Touchstone 1.0 S-parameter file measured on connected Teledyne LeCroy SPARQ or imported from SPARQ or VNA		
Equalizer	**CTLE:** Auto-set boost, or custom settings for DC gain, zero frequency, pole 1 frequency, pole 2 frequency **FFE:** Auto-find levels and tap values for user-selectable taps/precursor taps, or manually set values **DFE:** Auto-find levels and tap values for user-selectable taps/precursor taps, or manually set values and erasure delta **PLL:** Select from predefined software PLLs, including FC Golden, PCIe, DVI, FB-DIMM, USB3.0 SS or custom set		
Eye Measurements	Eye Height Eye Crossing Mask Hits Avg Power Eye Width One Level Zero Level Eye Amplitude Mask outs BER		
Jitter Measurements	**Scalar** **Waveforms** Tj Jitter Spectrum Jitter CDF Rj Jitter vs Time (JitterTrack) Bathtub Curve Dj Dj Extraction Filtered Jitter DDj Jitter Distribution ISOBER Analysis DCD Qfit Pj ISI		
Additional	See Teledyne LeCroy SPARQ datasheet for additional software specifications		