

LeCroy SPARQ Series Release Notes

Version 6.6.0.5, Release date: September 5, 2011

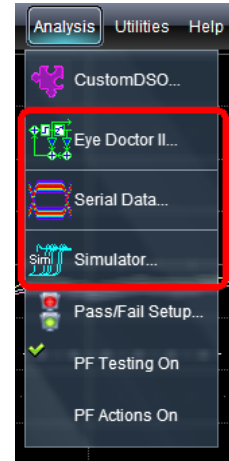
New Features

Support for Signal Integrity Studio

Signal Integrity Studio is an add-on to the LeCroy SPARQ application software. With SI Studio, users can analyze the signal integrity characteristics of a channel, including its eye diagram and jitter. The channel is described by its S-parameters, which can either be measured by an attached LeCroy SPARQ Signal Integrity Network Analyzer, or output from a VNA or other S-parameter modeling software. For more information about Signal Integrity Studio, see <http://www.lecroy.com/SIStudio>.

The Signal Integrity Studio capabilities of the SPARQ software application are contained within three items found within the Analysis menu:

- **Simulator:** Opens up the **SPARQ Simulator Dialog** for configuring the simulated signal that is input to the EyeDoctorII and/or Serial Data features
- **Eye Doctor II:** Opens up the **Eye Doctor II Dialog** for configuring pre/de-emphasis, channel emulation/de-embedding, and equalization
- **Serial Data:** Opens up the **SDAII Dialog** for setting up the application to measure eye diagrams and to perform jitter analysis.



Improvements/Enhancements

Remote Control

Some legacy remote control commands for LeCroy oscilloscopes can now be used with the LeCroy SPARQ to access waveforms without requiring mapping of the waveform to a memory or math function. For example, to save the S1 trace, the command S1:WF? ALL is supported.

Help File

The online help file has been enhanced to include support for Signal Integrity Studio, and includes updated information where users have requested additional information or clarifications, including the Theory of Operation section

Fixes

1. Installation error pertaining to "Msscript.ocx" has been resolved.
2. The "Sequencer pre-check" now confirms the user 2nd-tier calibration L12T file is present.
3. Single-port measurements on port 2 of the 4002E are now supported.

Version 6.5.0.5

Release Date: June, 2011

New Features

Stand-alone Operation

The SPARQ application now operates in "analysis" mode when the SPARQ hardware is not connected. Prior to this version, the application required that a SPARQ be connected in order to run. With this version, the "No Hardware Detected" message is still displayed on startup if a SPARQ isn't connected, but will now open up in "analysis mode" after clicking OK. In analysis mode, users can recall saved ".cal" files in order to perform additional analysis, as well as read in saved SNP touchstone files. When in analysis mode, the Go and Continuous buttons are grayed out, since these buttons are used to initiate the acquisitions when taking a new measurement.

Note: The SPARQ application uses factory calibration data when either connected to SPARQ hardware or when operating in analysis mode. This data is stored on your PC, and is based on serial number; you can see the serial number in use by going to **Help** → **About**. The serial number will be that of the last SPARQ used.

Gating

Users can de-embed portions of their DUT with the new **Gating** feature. This feature works in two ways: 1) port extension, in which the reference plane is moved as determined from a user-defined delay, characteristic impedance and loss, and 2) impedance peeling, in which the reference plane is moved by analyzing the measured impedance profile and by incorporating the specified delay and loss characteristic. Each port can be gated independently, using either single-ended or differential port configuration. The de-embedded portions are saved as S2P files and are available for future use. Gating is configured in a new dialog that can be opened via the menu path **SPARQ Setup** → **Gating**.

Pass/Fail Parameter Limit Testing and Mask Testing

Pass/Fail testing allows users to configure up to 8 conditions to determine if a measurement is to be deemed passing or failing. Each condition can either be a comparison of a parameter measurement against a defined limit (e.g. $\text{Max}(S1) < -20\text{dB}$), or a comparison of a waveform to a predefined mask that can be created using LeCroy's free MaskMaker utility. The waveforms used for either parameter or mask testing can be S-parameters, time domain views, or derived math functions or zooms. Pass/fail conditions are configured via the Pass/Fail item in the Analysis menu, and masks can be made using LeCroy's MaskMaker software, which is available at no charge from the LeCroy website. Pass/Fail testing results can be viewed on-screen and can be readout via remote control. The pass/fail functionality is the same as can be found standard on LeCroy X-Stream digital oscilloscopes.

Two application notes are available on the LeCroy website:

http://www.lecroy.com/files/appnotes/SPARQ_Pass-Fail_Mask_Testing.pdf

http://www.lecroy.com/files/appnotes/SPARQ_Pass-Fail_Limit_Testing.pdf

Impulse Response Length Limiting

Users can choose to limit the impulse length as a step in the algorithm for calculating S-parameters. By limiting the impulse length, the S-parameters returned are smoother as if via a using fewer points or a larger delta-frequency. When this feature is enabled, the calculated S-parameters are converted to the time domain via an

iFFT to obtain impulse response waveforms. These waveforms are truncated to include the +/- the time specified in the corresponding entry box for the time length. (When also enforcing causality, only the truncation retains only the positive time.) The truncated waveform is converted back to the frequency domain resulting in S-parameters with a limited impulse length. This feature is configured in the extended view of the main setup dialog.

See Technical Note at http://www.lecroy.com/files/whitepapers/SPARQ_Impulse_Response_Limiting_rev2.pdf

Custom Reference Impedance

Users can reference the measured S-parameters to a value other than 50 ohms with the Custom Reference Impedance entry box, which is located in the extended view of the main setup dialog. When using this feature, the S-parameters are transformed from 50 ohm to the desired value via the standard software algorithm. Use this feature when there is a specific need to generate S-parameter results referenced to something other than 50 ohms.

Arbitrary Port Selection

Users can opt to use any ports for the measurement rather than consecutive ports starting with 1. For example, a 2-port measurement can be made using ports 3 & 4, or on the 12-port SPARQ (soon to be released), ports 9 through 12 can be used for a 4-port measurement. To configure the SPARQ to use arbitrary ports, use the "advanced" port configuration dialog that is accessed via the **Configure** button in the extended setup dialog. This capability can increase measurement throughput by allowing users to cable all ports to multiple DUTs or lanes, and, via a script, take successive measurements without pausing to change DUTs.

Note: Depending on the shipping date of your SPARQ, some changes to the calibration files on your PC are required before using this feature. If the SPARQ indicates that a file is missing when attempting to make a measurement using arbitrary ports, contact sparq.requests@lecroy.com

User 2nd-tier Calibration

A 2nd-tier calibration is similar to a manual calibration, but which is performed after calibrating the SPARQ automatically. The 2nd-tier calibration is applied "on top" of the automatic cal, (hence the name "2nd-tier"). This feature is also used to establish a new reference plane for the purpose of de-embedding probes or cable test fixtures.

See Application Note at

http://www.lecroy.com/Files/AppNotes/Using_2nd-Tier_Calibration_for_Cable_Test_Fixture_De-embedding_Rev2.pdf

Improvements / Feature Enhancements

Multi-core support

The SPARQ application now uses all cores, resulting in speed increases during the calculation phase that scale with the number of cores present.

Save S-parameters on Actions

The actions to Beep, Save, and Email can be configured to occur at the end of a measurement that is initiated via clicking **Recalculate** or **Go**, or only when clicking Go. This is configured in the Result Actions dialog.

Fixes

1. The action of invoking a default setup will turn off the pulser when running in "Live TDR/TDT mode" (via the TDR/TDT dialog).
2. The behavior of the estimated time remaining has been improved to avoid the appearance of a software hang.
3. The **Hardware Programmer** application has been improved to give a better indication of a successful upgrade. (The hardware programmer is used to upgrade the FPGA and microprocessor in the SPARQ hardware.)

Miscellaneous change:

User Port and DUT port entry boxes were removed from the setup menu. These boxes were not intended to be for data entry, and caused some confusion.

Version 6.3.2.3

Release Date: December 16, 2010

Initial Release; no release notes apply.