LeCroy

WaveStream™ Fast Screen Update and Much More (WR_Xi Note 3)

LeCroy's new WaveRunner Xi oscilloscope includes a new fast acquisition mode called WaveStream™ fast viewing mode. As the name implies, this is a fast waveform streaming feature that updates the display at up to 8000 waveforms/second. The screen rendering in WaveStream maps acquired points with up to 256 levels of intensity to produce a vivid three dimensional effect, as shown in Figure 1. This is a response to user specified needs for a lively, analog-like update mode that provides a fast waveform display with a simple front panel intensity adjustment. The front panel Intensity control allows the user to set the mapping of the 256 intensity levels.

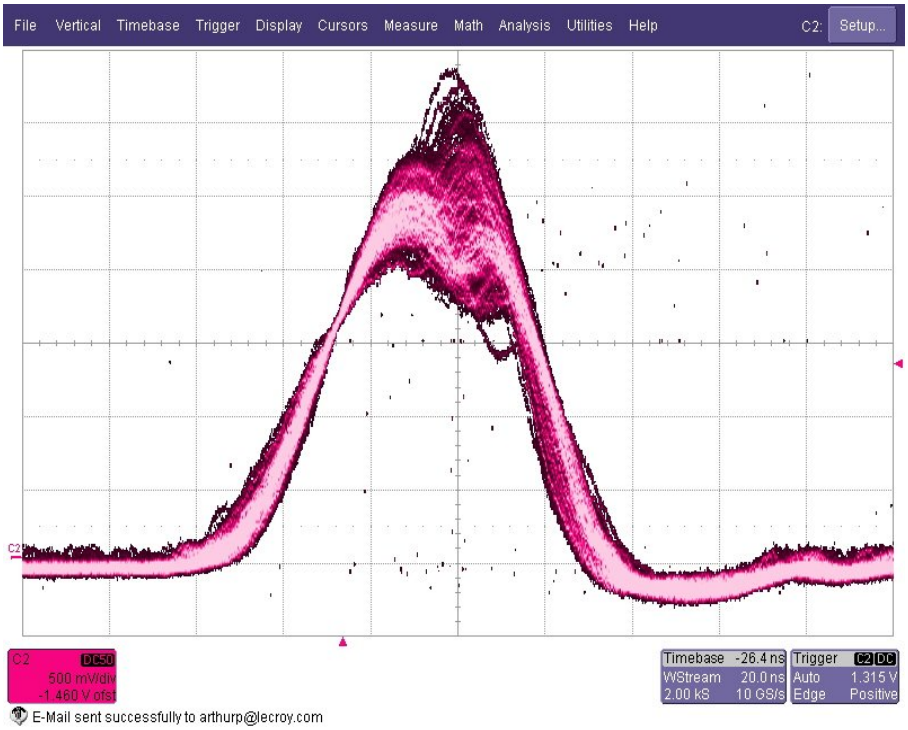

Figure 1: Acquiring multiple sweeps of a print driver waveform showing metastability, using LeCroy WaveStream™ fast viewing mode sampling at 10 GS/s with up to 8000 screen updates per second.

WaveStream is ideal for viewing non-stationary-type data that changes very rapidly. This includes intermittent events like 'runts' and 'glitches.' An example is shown in Figure 1 where the scope is monitoring metastability in a print head driver. WaveStream combines a rapid screen update rate with a persistence display to show a history of the waveshape variation. Note that unlike other 'fast update' technologies, WaveStream operates at the scope's highest sampling rate, 10 GS/s in this example.

The user can enter WaveStream fast viewing mode by simply pressing the Intensity knob on the front panel. The green WaveStream LED will illuminate to denote the scope is in WaveStream fast viewing mode. Figure 2 shows the Timebase dialog box, which summarizes the scope's acquisition mode setup.

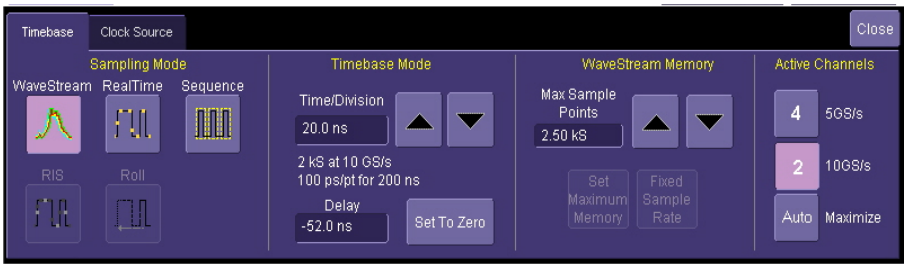

Figure 2: The Timebase dialog box showing the WaveStream acquisition setup.

Another unique feature of WaveStream acquisition is that it permits the user to use the math and measurement tools simultaneously with the fast screen update. The WaveStream display is composed of many acquisitions superimposed as pixel data. That is how we get such a fast, lively update rate. However, we keep the last trace as data, so if you store to memory, or toggle to real-time mode, you get a single trace display. The math and parameter measurements are based upon only the last trace in the WaveStream acquisition.

The combination of fast update rate and math and measurements is shown in Figure 3. In this screen image, the WaveStream display shows the eye diagram for an optical recording signal. This type of waveform encodes data as variation in pulse width. Only certain pulse width values are allowed. In Figure 3 the width of the acquired pulses is being measured and the measurement values are being histogrammed so the user can combine the heuristic 'feel' of the eye pattern with the reassurance of quantitative data. The histogram of pulse width shows the expected separation of pulse widths.

Figure 4 shows a live video feed. This is another rapidly changing signal that benefits from the fast update of the display.

WaveStream fast viewing mode is a new feature that offers users fast update rate but with some very clear advantages over anything you've seen before.

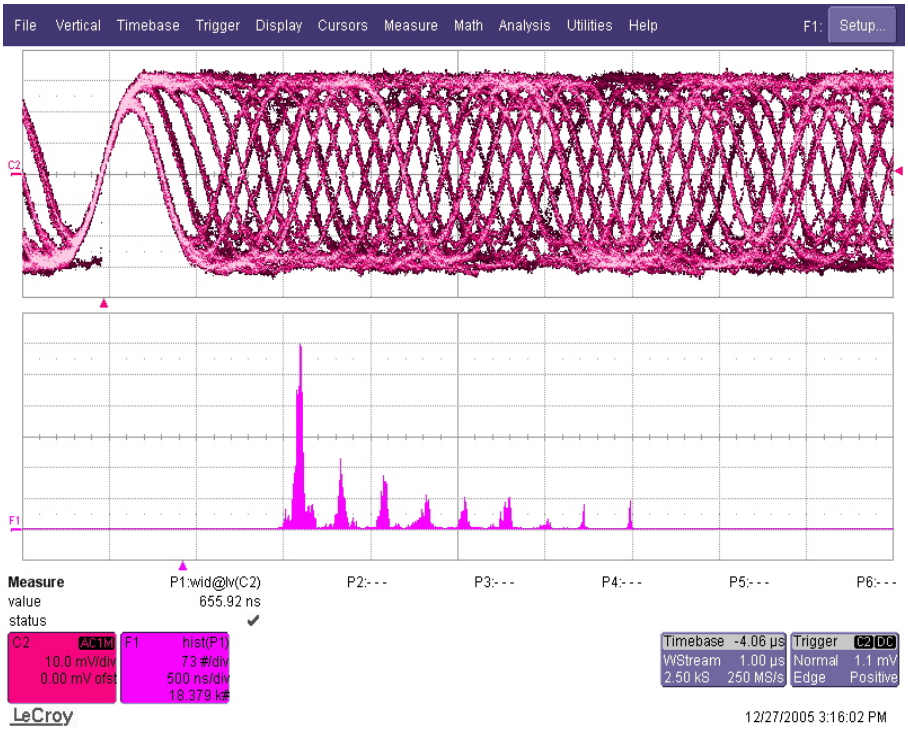

Figure 3: An example of combining fast update with both measured parameters and math histograms for an optical recording signal

Figure 3: Fast WaveStream display of a live video signal