

## About the Agilent Oscilloscopes in 38-600

Through a generous gift by Agilent in Spring 2014, each bench in the 6.115/6.131 lab is now equipped with a new Agilent MSO (mixed-signal oscilloscope).

The scopes have many more helpful features, so we'll point out a few here that might be most useful to you as a 6.115/6.131 student.

The scope manual is available on the 6.115 course website, under Miscellaneous.

### Familiar Features

Most scope functions should be familiar to you and work the same way as the Tektronix digital scopes you're used to: horizontal and vertical scales, triggering, single-sequence and run/stop controls. The Run/Stop and Single keys are prominent in the upper-right corner of the scope's front panel.

### Advanced Triggering

Not only can you trigger your waveform from an edge, but you can also have the scope trigger based on pulse width, rise/fall time, setup and hold time, and more. See page 143 of the scope manual.

### Digital Analysis

The scopes have four analog channels and 16 digital channels. The analog channels can be used with conventional probes; the digital channels require a separate breakout that may be available upon request. The digital analyzer can therefore handle two 8-bit data buses at once, with on-screen interpretation tools that clarify bus activity.

However, the analog channels may *also* be configured as digital analyzer channels, to analyze serial protocols such as RS232 and SPI. Connecting two probes (Rx and Tx) to an RS232 bus on your kit or final project, and following the instructions on p. 423 of the scope manual, may be very helpful.

### Zoom

You can hold a waveform on screen and generate a separate window to zoom in on a small portion of that waveform using the Zoom button (p. 56) or search for certain features in your waveform with Search tools (p. 59).

### Math

Our familiar Tektronix scopes were plenty capable of adding and subtracting signals (the red "Math" key), which many of you have probably found useful. But the new scopes can perform more advanced math features, such as calculus and frequency-domain transforms. The methodology is the same: activating the Math mode will generate a new waveform on-screen. See page 73 of the scope manual for more help.

### Waveform Generator

Though your kit has a useful function generator on-board, the scope can generate very diverse types of waveforms with precise control (as long as you don't need more than 5V peak-to-peak). Press the Wave Gen key and use the Waveform Generator BNC output port beneath the screen. See p. 259 for more.

## Labels

Ever wished you could tag each channel on your scope so you can easily tell where in the circuit it's coming from? Well, now you can. Hit the Label key between Channels 1 and 2 and you can type in names for each on-screen waveform. Yes, it's that cool. See p. 137.

## USB Storage

Now there's no excuse for taking cell-phone pictures of your scope's screen (or omitting scope shots in your lab notebook!). The USB port on the front panel of the scope can accommodate a USB flash drive. Put it in, then hit Save/Recall on the front panel. Do this:

1. Press Save, then press Format.
2. Turn the Entry knob (green lit circular arrow) to select **24-bit Image (.png)**.
3. Press the second softkey to navigate to the location you want to save to on the flash drive.
4. Press Settings, and make sure **Invert Grayscale** is selected (this will make a white background so it's more practical to print).
5. Press **Press to Save** when ready.

Of course, you can also save and recall setup data (to get the scope working just your way) and CSV data (if you want to analyze it in MATLAB or similar). More info is on p. 275 of the scope manual.