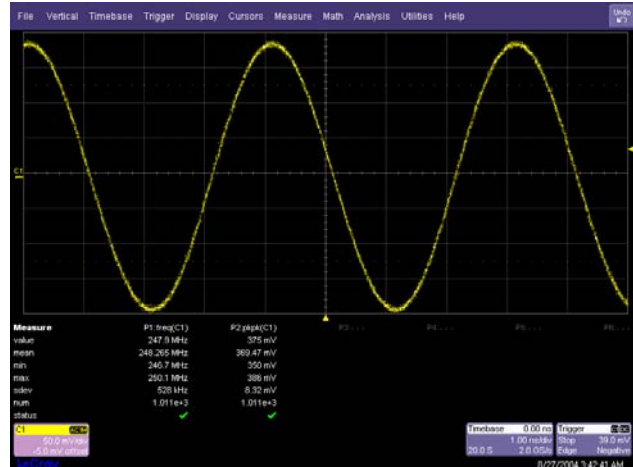


Quick, Easy Video Measurements and Troubleshooting with the TDS3000B Series Oscilloscopes



► Introduction

An oscilloscope is a productivity companion – its powerful features along with its ease of setup and use allow you to be more successful in accomplishing your measurements faster and easier. To illustrate this concept, this brief compares the Tektronix TDS3000B Series digital phosphor oscilloscope with the LeCroy WaveSurfer 454 digital oscilloscope relative to video applications.

THE DIFFERENCE IN VIDEO TRIGGER CAPABILITIES

Both the TDS3000B and WaveSurfer 454 offer a standard video trigger. While the WaveSurfer 454's video trigger offers field- and line-select capability for NTSC, PAL and custom video, the TDS3000B Series' standard video trigger includes only field-select capability.

However, the TDS3000B Series delivers additional video trigger capabilities – with the optional TDS3VID and TDS3SDI video modules – that are not available with the WaveSurfer 454. These modules deliver capabilities such as video autoset, video graticules, line select and a vectorscope or picture display.



Figure 1. WaveSurfer 454, video trigger menu



Figure 2. TDS3054B, video trigger QuickMenu

VIDEO TRIGGER SETUP MAKES MEASUREMENTS FAST AND EASY

To illustrate how fast and easy it is to set up the TDS3000B Series' video trigger, we compare it with the WaveSurfer 454's video trigger.

When using the WaveSurfer 454's video trigger, there are many settings that must be changed to begin the correct setup; these are different from the default settings:

- Input coupling must be changed from the default AC 1 M Ω to DC 1 M Ω
- V/div setting must be changed manually to 143 mV (but that is impossible – the variable gain resolution is 2 mV, and the nearest setting is either 144 or 142 mV/div)

When TV trigger is selected in the Smart Trigger menu, several more things must be changed manually:

- The slope must be changed to Negative – 99% of video is Sync Negative.
- The trigger mode must be changed to Normal. The Auto trigger mode is completely unstable.
- The “# of fields” selection must be changed to 2 or 4 if you want to trigger on a selected line.
- There is no Auto-sensing of the video standard.
- Autoset returns the setup to Edge trigger.
- For the best display of video, the Analog Persist display must be selected manually.

In contrast, the TDS3000B Series' QuickMenu makes setup of the video trigger simple and quick by selecting many things for you. From the factory setup, simply press QuickMenu and select Video under Menu. Then, press Autoset, either Lines or Fields. Several things happen automatically:

- The vertical, horizontal, and trigger settings are selected immediately and correctly for the video standard present at the input
- The IRE graticule is selected and displayed, with the video waveform placed correctly on that graticule. A mV video graticule is available with a touch of the Waveform menu button.
- The DPO persist time is set to Auto.
- There is no need to deal with fine vertical scale or offset, nor even any need to select the horizontal scale setting.

OTHER DIFFERENCES THAT IMPACT YOUR PRODUCTIVITY

Response to rapid changes in Average Picture Level (APL) is important in a video system or the associated test equipment. There is a special waveform pattern that must be tested, called a “bounce” signal. The test generator switches a few lines between 100% white level and black level. In the line immediately following the moving lines, there should be no shift or tilt in the black level as the previous line switches from black to white. Figures 3 and 4 show magnified views of this tilt on the WaveSurfer 454 and TDS3054B Series oscilloscopes, respectively. The WaveSurfer tilt is ~1.5%.

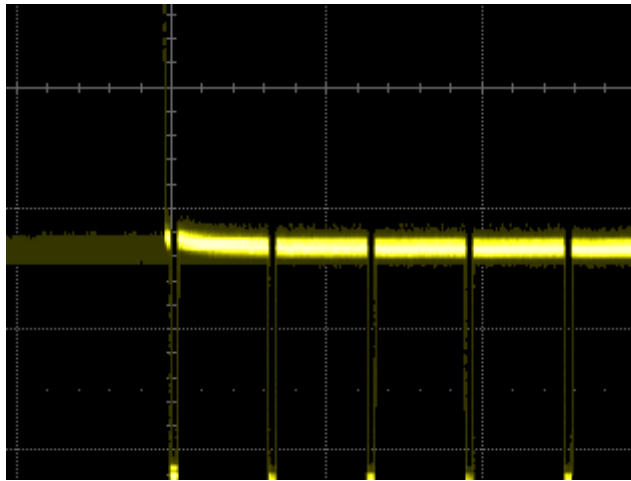


Figure 3. WaveSurfer 454, tilt

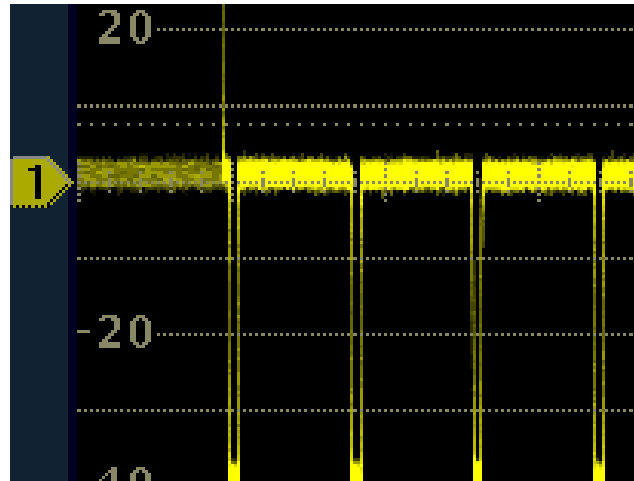


Figure 4. TDS3054B, tilt

In addition, unlike the TDS3000B Series oscilloscopes, the WaveSurfer 454 does not offer any additional video capabilities – no IRE or mV graticule, no vectorscope or video picture display, no SECAM setting, no EDH error detection.

CONCLUSION

From simple setup to powerful capabilities, the TDS3000B Series' **video trigger** makes it an ideal solution for video measurements and troubleshooting.

When compared with the WaveSurfer 454, the display, with either an IRE or mV graticule, makes subsequent accurate measurements much easier to accomplish. Additional features, such as vectorscope and picture capability, make the TDS3000B Series much more useful for video applications. Its vertical amplifier is inherently more accurate when measuring dynamically changing signals like those found in video. Finally, it is far easier to set up. In addition, its small size, light weight and battery operation make it useful for portable applications.

Quick setup, specialized graticules, and good vertical response are critical in video applications – and the TDS3000B Series shines.