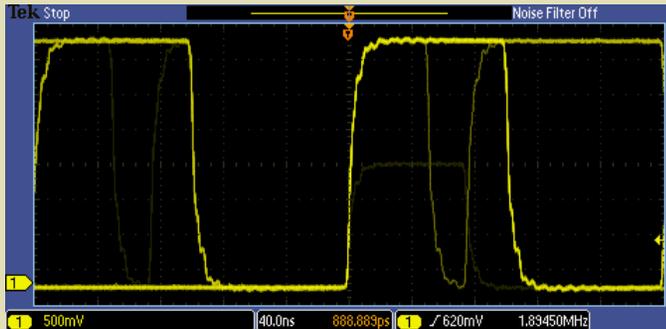


Common Stages of Digital Debug

1 Discover

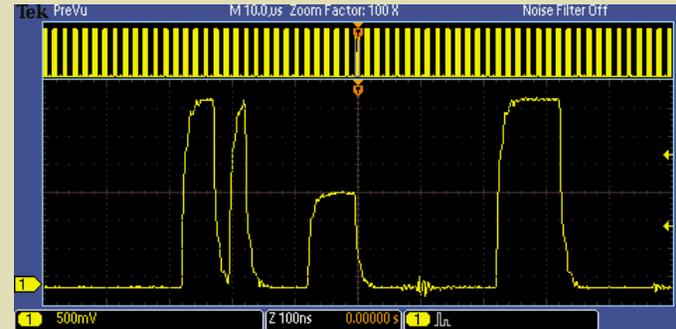


To solve a problem, you must first be able to find and visualize the problem.

Key points to remember:

- Your probes will affect your ability to accurately visualize your signal. You need the right probes to maintain high signal fidelity and minimize loading of your circuit.
- An oscilloscope with a fast waveform capture rate allows you to see glitches and other infrequently occurring events.
- An intensity-graded display (see above) intensifies areas of the signal that occur more frequently, showing a “history” of a signal’s activity.
- **Tip:** To maximize waveform capture rate, use the lowest possible record length for your waveform.
- **Tip:** You can adjust the persist time of each waveform. By doing this, you can get an indication of the amount of time between anomalies.

2 Capture



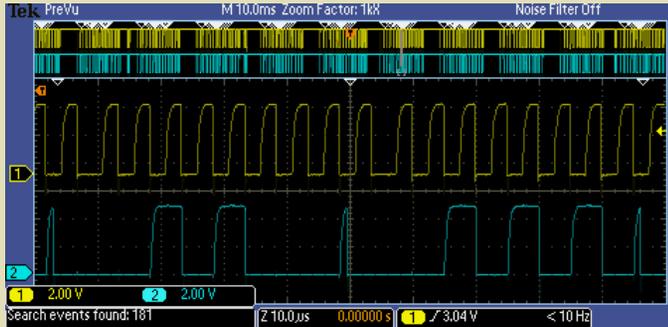
Once you know a problem exists, you need to capture that event in memory to better understand root cause.

Key points to remember:

- The longer the record length, the longer the time window you can capture with high resolution (high sample rate).
- To capture a problem, you need to define a trigger to match the problem’s signal characteristics.
- In complex designs, you may need to capture several analog, serial and parallel digital signals to understand the circuit conditions around an event. A mixed signal oscilloscope offers digital channels, in addition to analog channels, for troubleshooting complex designs.
- **Tip:** A pulse width trigger can be used to capture glitches.
- **Tip:** A runt trigger can be used to capture pulses with insufficient amplitude.

Common Stages of Digital Debug

3 Search

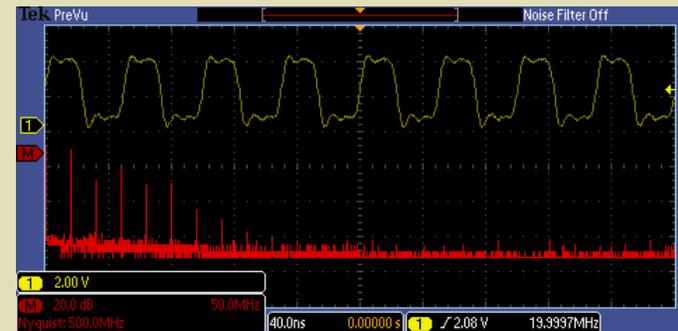


The next stage is to find the specific event of interest in your long waveform record.

Key points to remember:

- Wave Inspector® speeds waveform navigation with dedicated controls:
 - **Zoom:** Zoom in to see more detail.
 - **Pan:** Pan through your waveform.
 - **Mark:** Set marks throughout your waveform. Use the arrow buttons to move between your marks.
 - **Search:** Automatically search for criteria you specify. Wave Inspector will mark every occurrence. Use the arrow buttons to move between marks.
- **Tip:** You can quickly search for your trigger event by selecting “Copy Trigger Settings to Search” in Wave Inspector’s Search function.

4 Analyze



The final stage of debug is to analyze your signals to identify root cause.

Key points to remember:

- You can use the graticule on the oscilloscope display to manually measure signal parameters.
- Cursor measurements are made by manually aligning a pair of cursors to points on the waveform and then reading the measurement values from the cursor readout on the display.
- Automatic measurements use algorithms stored in the oscilloscope’s firmware.
- Waveform math functions can also be used to add, subtract and multiply waveforms.
- To view the frequency components of your waveform, use the Fast Fourier Transform (FFT) function in waveform math (as shown above).

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