Oscilloscope Fundamentals | Capturing Your Signal

Tektronix TBS 1000C SERIES DIGITAL OSCILLOSCOPE What is an oscilloscope anyway? Multipurp Save An oscilloscope is a diagnostic instrument that plots the amplitude of an electrical signal as it changes over time. Picture below shows the block diagram of an oscilloscope. Horizontal Vertical Signal A/D CH2 Conditioning Acquire Scale 0 div Push S Page 1/2 CH1 ∫ 0.00V CH2 5.00V 250MS/s 11 Feb 2020 Aux In Acauisition Display uP 6 Display \longrightarrow Memory Memory Vertical, Horizontal, and Trigger settings Step 3: Step 4: Step 2: Step 1: Set Horizontal Scale **Trigger Settings** \mathcal{W} Set Vertical Scale Probing Set the total amplitude to Set the total time to be Stabilize the waveform on the display Connect the instrument to circuit be displayed on the screen displayed on the screen Select which input signal is **Scale** Adjusts the size of the waveform **Scale** Sets the amount of time Source **1.** Connect the probe to the input channel on the screen per channel, displayed on the screen for compared to the trigger settings. of the instrument. a larger waveform gives better all channels. **Type** Edge trigger is the most 2. Check probe compensation: Attach the measurement resolution. commonly used trigger type; **Position** Moves the waveform left probe tip to the probe compensation trigger on rising or falling edge, **Position** Moves the waveform up or right on the screen. test point on the instrument. Adjust and down on the screen. pulse width and runt are other the probe compensation until you see trigger types available. **Attenuation** Sets the maximum voltage a clean square wave on the screen. that can be displayed; scope Level Determines the voltage level on attenuation setting needs to 3. Connect probe ground to the circuit the input signal at which the match probe attenuation. ground and probe tip to the signal trigger occurs. vou want to view / measure. **Input** Use DC coupling to see all the **Coupling** input signal. Use AC coupling to see only the AC signal riding on top of a DC offset.

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Avoiding Pitfalls

- No Signal:
- a. Is the channel / DUT turned on?
- b. Is the waveform off the screen? Try adjusting the vertical position / scale.
- c. Is the instrument waiting for trigger? (Is it displaying "Ready"?) Verify trigger source; try adjusting the trigger level, forcing a trigger or switching to auto mode.
- Aliasing: If the frequency of the signal on the screen seems too low, or it is difficult to get a stable waveform on the screen, adjust horizontal scale to increase the sample rate.
- Unexpected measurement results: Verify that probe is compensated, verify measurement settings such as ref levels and gating, verify the probe attenuation.
- No stable signal: Verify trigger source, trigger level.





