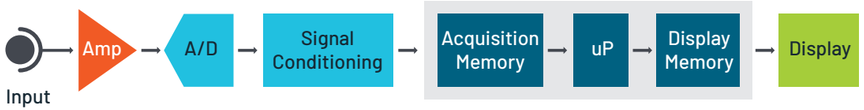
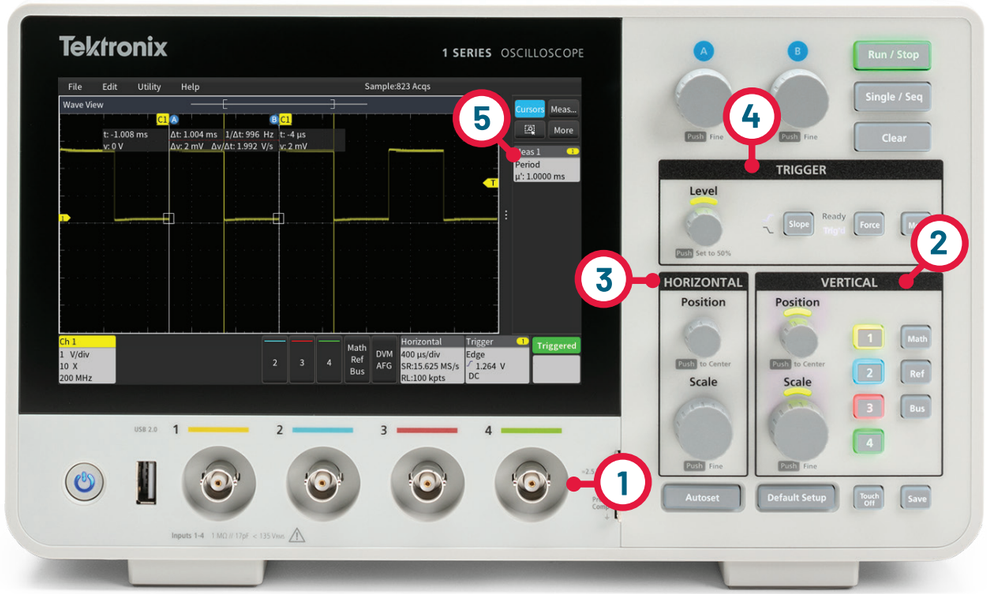
Oscilloscope Fundamentals

Capturing Your Signal

What is an oscilloscope anyway?

An oscilloscope is a diagnostic instrument that plots the amplitude of an electrical signal as it changes over time. The block diagram below shows how an oscilloscope processes a signal.





Avoiding Pitfalls

- **No Signal**:
  a. Is the channel / device turned on?
  b. Is the waveform off the screen?
  Try the Autoset feature.
  c. Is the instrument waiting for trigger?
  (Is it displaying "Ready"?) Verify trigger source; adjust the trigger level, force a trigger or switch 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 the horizontal scale to increase the sample rate.
- **Unexpected measurement results**: Verify the probe is compensated, verify measurement settings such as ref levels and gating, verify the probe attenuation.
- **No stable signal**: Verify trigger source, trigger level.

Step 1: Probing

Connect the instrument to circuit	
1.	Connect the probe to the input channel of the instrument.
2.	Check probe compensation: Attach the probe tip to the probe compensation test point on the instrument. Adjust the probe compensation until you see a clean square wave on the screen.
3.	Connect probe ground to the circuit ground and probe tip to the signal you want to view / measure.

Step 2: Set Vertical Scale

Set the total amplitude to be displayed on the screen	
Scale	Adjusts the size of the waveform on the screen per channel, a larger waveform gives better measurement resolution.
Position	Moves the waveform up and down on the screen.
Attenuation	Sets the maximum voltage that can be displayed; scope attenuation setting needs to match probe attenuation.
Input Coupling	Use DC coupling to see all the input signal. Use AC coupling to see only the AC signal riding on top of a DC offset.

Step 3: Horizontal Scale

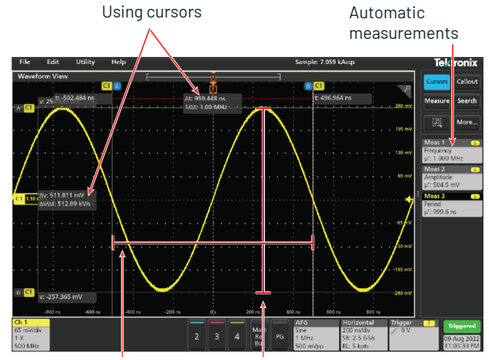
Set the total time to be displayed on the screen	
Scale	Sets the amount of time displayed on the screen for all channels.
Position	Moves the waveform left or right on the screen.

Step 4: Trigger Settings

Stabilize the waveform on the display	
Source	Select which input signal is compared to the trigger settings.
Type	Edge trigger is the most commonly used trigger type; trigger on rising, falling or both edges. Other more advanced triggers such as Pulse Width, Runt Timeout, Setup and Hold, Rise/Fall Time, Logic and Pattern trigger types are available for capturing more complex events.
Level	Determines the voltage level on the input signal at which the trigger occurs.

Step 5: Measurements

Measure voltage and time characteristics of signals



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