

Re: Oscilloscope Restistance

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eat411 wrote:

- > *I need to know if the resistance in an oscilloscope is high or not. i*
- > *believe they have a low resistance, but i am not sure why they would*
- > *need to be designed this way. I would appericiate an explanation.*
- >
- > *thanks in advance*

The answer depends on the kind of signal you need to measure and type of oscilloscope used.

A typical oscilloscope vertical amplifier input will have a 1M ohm input impedance. The typical 10x passive probe will have a 10M ohm impedance.

For signals of 350MHz or less conventional passive probes are fine.

Oscilloscope designed for signals from 500MHz to 4000MHz will benefit from using active probes.

Active probes have high bandwidth amplifiers at or near the probe tip.

The amplifiers output is designed to drive a 50 ohm cable to the oscilloscope vertical amplifier input.

Oscilloscope that are intended to use only active probes will usually have only a 50 ohm input impedance.

The basic concept here is that it takes a lot of power to accurately drive a 500MHz signal down a 1 meter cable. Most circuits that use signals at this frequency do not have the needed power and are adversely affected when connected to the load of an oscilloscope vertical amplifier input.

The ideal oscilloscope probe would have very high impedance, low capacitance and disturb the signal very little.

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As the signal frequency increases it becomes much harder to make a probe that can do what is needed.