

By Pico 4 Pico

Scope &
Signal Generator



Objective

- Implement a scope for Pico.
- AD conversions are to take place on the Pico,
- Display should be on the PC.

Notes

- Before you start it is recommended to [watch some videos](#) (I mean this and more) talking about the basics of scope usage.
- Understand the spectrum of scope usage.
- Get a closer look at the capabilities of the scope screen and all those menus and buttons.
- Discuss within the group which functions you need.
- Note that scopes have evolved over time, and the buttons and display are mostly the result of this evolution.
- Design a scope from scratch, do you really need to copy the usage preferences from a classical scope?
- Can you be more creative to make the scope more usable? Creative interfaces are subject to bonus!
- ...

Specs

- Our intention is to measure voltages in 0-3.3V range
- The scope should have a minimum of 2 channels
- Single sweep should be possible - use single shot charge or discharge of an RC circuit for testing periodic signals, also try capturing button bouncing effect
- Using triggers or some more elegant methods, periodic signals should easily display in a stable fashion on the screen.
- Highest frequency signal stably and accurately displayed on the screen will determine your baseline points
- Peak to peak values should always be available
- For periodic signals frequency, period should be automatically displayed
- For square waves, DC should be automatically displayed
- ...

Bonuses

- XY plots using 2 channels
- Creative addition to GUI that makes the usage simpler and intuitive.
- Fast response of the GUI to changes in the settings