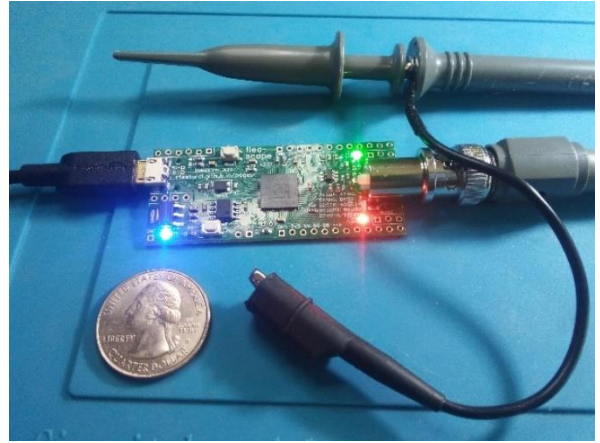


# Flea-Scope™ for Education

Flea-Scope™ is a very low-cost ([\\$18 retail available here](#)) and easy-to-use 18 million sample-per-second (MSPS) USB oscilloscope and mixed-signal logic analyzer with a built-in waveform generator! For more advanced users, Flea-Scope can also be used as a fully reprogrammable embedded system core! Flea-Scope can be controlled by any Chromium-based web browser that supports WebUSB API or Web Serial API running on a computer, tablet, or phone, with no need for further software install – just plug it in and open a web-page and you are up and running!



The goals of the Flea-Scope™ project are many:

1. first of all, to encourage students to become producers of technology, rather than just consumers of it!
2. then, to allow students to visualize signals changing over time as they build and debug electrical circuits,
3. to expose students to the concepts and uses of oscilloscopes, logic analyzers, and waveform generators
  - ("trigger out" pin allows multiple Flea-Scopes to work together simultaneously for more channels!),
4. to excite students about the capabilities of microcontrollers (MCUs) and embedded systems, and
5. to provide students with an embedded system core which they can leverage into their own projects!

Flea-Scope™ can be used on many levels, from beginner to advanced, including:

1. (beginner, \$18) as an oscilloscope, logic analyzer, and function generator, using only a web-page,
2. (intermediate, \$18) as a [BASIC embedded system core](#) with debugger, using only a web-page
  - (with 18 programmable I/O pins, compatible with 0.1" (2.54mm) solderless breadboards!),
3. (advanced, \$18 + \$40) as a C embedded system core with debugger, using [Snap ICE](#) and MPLAB X IDE
  - (with 18 programmable I/O pins, compatible with 0.1" (2.54mm) solderless breadboards!).

Most of all, Flea-Scope™ is designed to be flexible and easy-to-use, with cross-platform support (Windows, Linux, macOS, and Android) and software-less install -- just open a web-page and you are up and running!



Flea-Scope™ is fully open-source, including:

- web-page GUI and deep-dive (BASIC) UI written in JavaScript,
- MCU firmware written in C using [Microchip MPLAB X](#),
- printed circuit board schematic and layout using [Novarm DipTrace](#), and
- extensive documentation.

See the github repositories ([web-page GUI and deep-dive UI user interfaces](#) and [MCU firmware/board/documentation](#)).

See the [Flea-Scope™ User's Guide](#) for detailed specifications and usage.

See a list of education projects [here](#).

See a preliminary video introduction on YouTube [here](#).

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