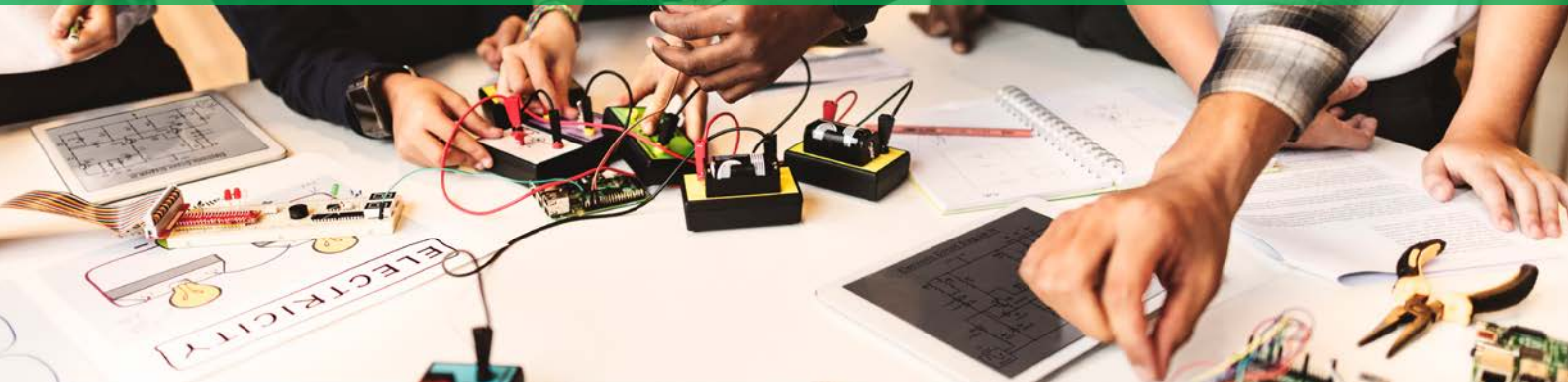


# ACTIVE LEARNING PROGRAM

## Tools for Students, Makers, and Enthusiasts

Analog Devices participates in active learning for students of all levels. From late secondary school and into colleges and universities, our tools, curriculum, and labs are designed to challenge and teach students to better understand the world of electronics and electrical engineering.



### Hardware Instruments and Kits

The world of electronics is the world of the invisible—it is impossible to see voltage, current, or radio waves with the naked eye. Analog Devices provides low cost, high quality instruments and parts kits to make the study of electronics accessible, intuitive, and fun.

#### ADALM1000

- ▶ USB powered learning tool
- ▶ Measuring and sourcing current (–200 mA to +200 mA) and voltage (0 V to 5 V) simultaneously on same pin
- ▶ Oscilloscope (100 kSPS), function generator (100 kSPS)
- ▶ 16-bit (0.05%) measurement accuracy with 4 digit resolution
- ▶ Source and sink operation
- ▶ C, C++, and Python bindings
- ▶ MATLAB® data acquisition toolbox support
- ▶ Visit [analog.com/ADALM1000](http://analog.com/ADALM1000)



#### ADALM2000

- ▶ USB-based instrument
- ▶ Oscilloscope ( $\pm 20$  V, 30 MHz)
- ▶ Voltmeter ( $\pm 20$  V)
- ▶ Spectrum analyzer (20 MHz)
- ▶ Arbitrary function generator ( $\pm 5$  V)
- ▶ Digital logic analyzer
- ▶ Digital bus analyzers (SPI, I<sup>2</sup>C, UART, parallel)
- ▶ 16-channel pattern generator
- ▶ 16-channel virtual digital I/O
- ▶ Network analyzer
- ▶ Two programmable power supplies (0 V ... +5 V, 0 V ... –5 V)
- ▶ Visit [analog.com/ADALM2000](http://analog.com/ADALM2000)



#### ADALP2000

- ▶ Analog parts kit for solderless breadboarding of analog circuits
- ▶ Analog Devices ICs included: sensors, op amps, converters, comparators, power converters
- ▶ Other components included: transistors, LEDs, resistors, potentiometers, capacitors, diodes, inductors
- ▶ Visit [analog.com/ADALP2000](http://analog.com/ADALP2000)
- ▶ Surface-mount devices conveniently mounted on break out boards
- ▶ Assortment of jumper wires for easy solderless connections
- ▶ Solderless breadboard included



#### ADALM-PLUTO

- ▶ Portable self-contained RF learning module
- ▶ RF coverage from 325 MHz to 3.8 GHz
- ▶ Up to 20 MHz of instantaneous bandwidth
- ▶ Flexible rate, 12-bit ADC and DAC
- ▶ One transmitter and one receiver, half or full duplex
- ▶ MATLAB, Simulink® support
- ▶ Visit [analog.com/ADALM-PLUTO](http://analog.com/ADALM-PLUTO)
- ▶ GNU Radio sink and source blocks
- ▶ Libiio, C, C++, C#, and Python API
- ▶ USB 2.0 powered interface with micro-USB 2.0 connector



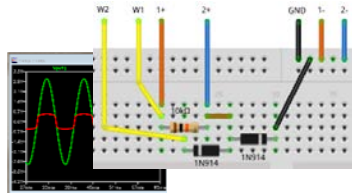
## Active Learning Curriculum

The active learning modules are ideal companions for Analog Devices' freely available lab exercises, educational examples, and even a complete textbook on software-defined radio. These materials help bridge the gap between fundamental theory and practice, so students can learn to use the necessary tools and learning modules effectively to solve real world problems.

### Analog Learning Materials

Curriculum and labs that help students and enthusiasts understand the fundamentals and then go off and try it on their own.

- ▶ Circuits 1 labs
- ▶ Circuits 2 labs
- ▶ RF/microwave labs
- ▶ Power labs
- ▶ LTspice®
- ▶ Visit [wiki.analog.com/activelearning](http://wiki.analog.com/activelearning)



### Digital Communications

Complete university-level textbook, courseware, slides, videos, and labs for digital communications classes. Focused around using ADALM-PLUTO for real over the air communications.

- ▶ Visit [analog.com/sdrforengineers](http://analog.com/sdrforengineers)

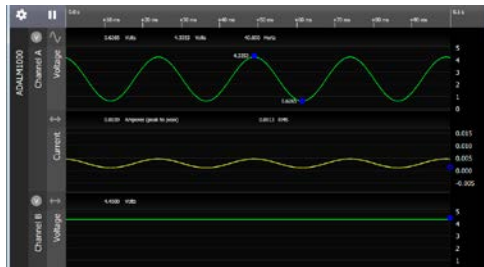


## Software Tools

Free open-source software and tools exist for the hardware instruments. These software instruments will run on Windows/Linux/Mac OS computers, making it easy to use and complete the curriculum and associated labs. The software instruments are typical of what a professional engineer would use when in a lab environment, so the skills learned while troubleshooting and debugging with these instruments will be useful when you get into the real world.

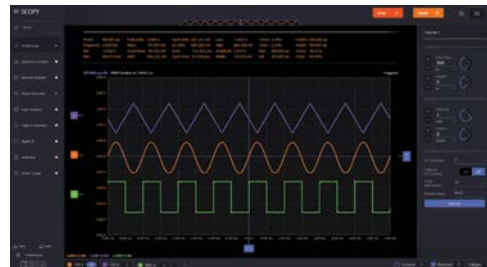
### Pixel Pulse—Used for ADALM1000

- ▶ Voltmeter
- ▶ Ammeter
- ▶ Ohmmeter
- ▶ Voltage source
- ▶ Current source
- ▶ Visit [github.com/analogdevicesinc/pixelpulse2](https://github.com/analogdevicesinc/pixelpulse2)



### Scopy—Used for ADALM2000

- ▶ Signal generator
- ▶ Oscilloscope
- ▶ Pattern generator
- ▶ Spectrum analyzer
- ▶ Network analyzer
- ▶ Logic analyzer
- ▶ Digital I/O
- ▶ Voltmeter
- ▶ Power supply
- ▶ Visit [github.com/analogdevicesinc/scopy](https://github.com/analogdevicesinc/scopy)



## EngineerZone® Online Support Community

Engage with the developers in the virtual classroom, as well as ADI's technology experts in our online support community.

Visit [ez.analog.com/community/university-program](http://ez.analog.com/community/university-program)



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