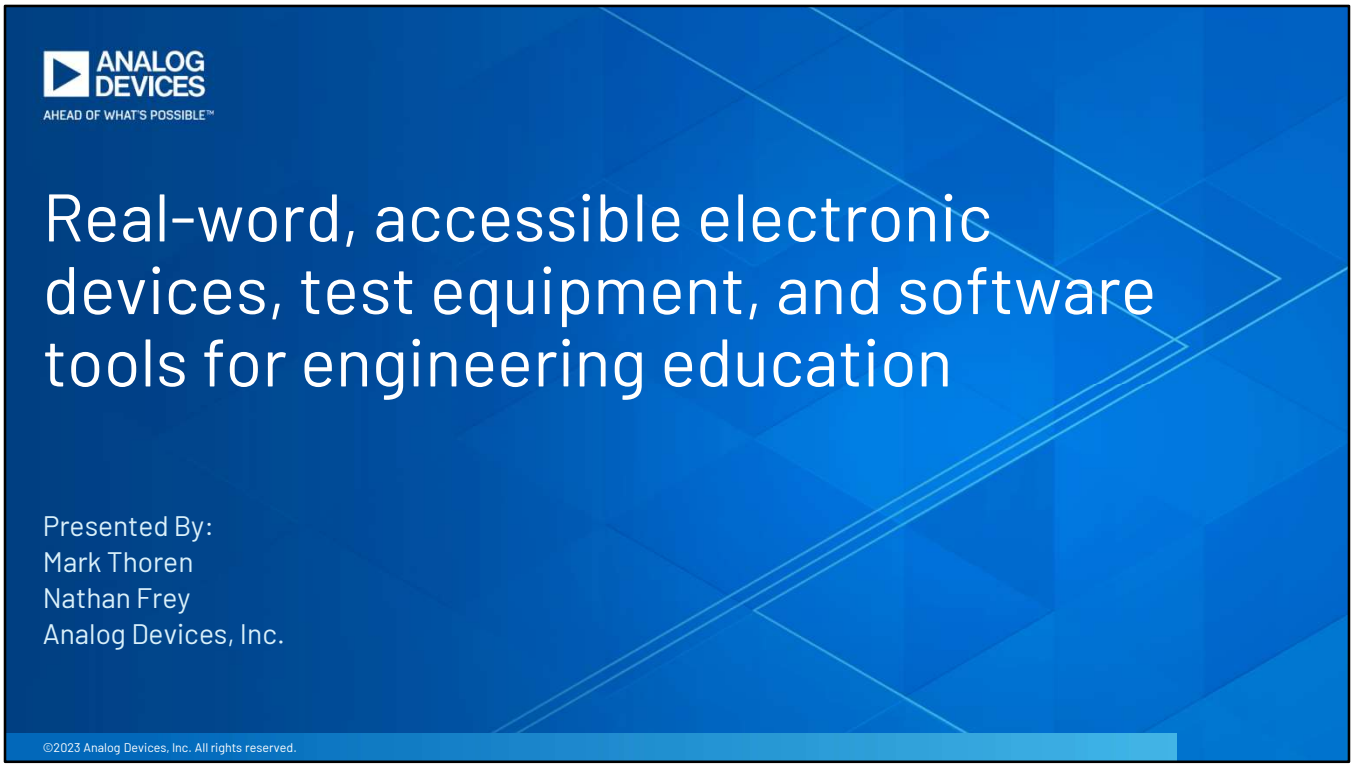
ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™



- This is the light cover slide option.

For Reference: session abstract

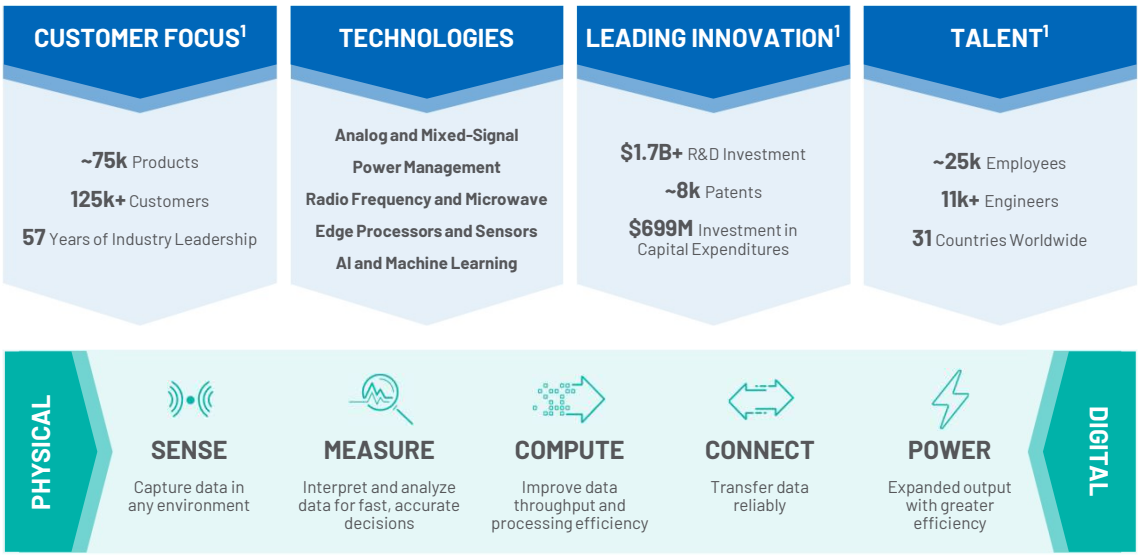
Analog Devices is the leading global high-performance analog technology company. The ADI University Program strives to make engineering education accessible through hundreds free Active Learning lab exercises, affordable test instrumentation, low-cost parts kits, and hardware modules designed to back up textbook theory with hands-on experience.

In this focus group, we will discuss Analog Devices' educational offerings, including:

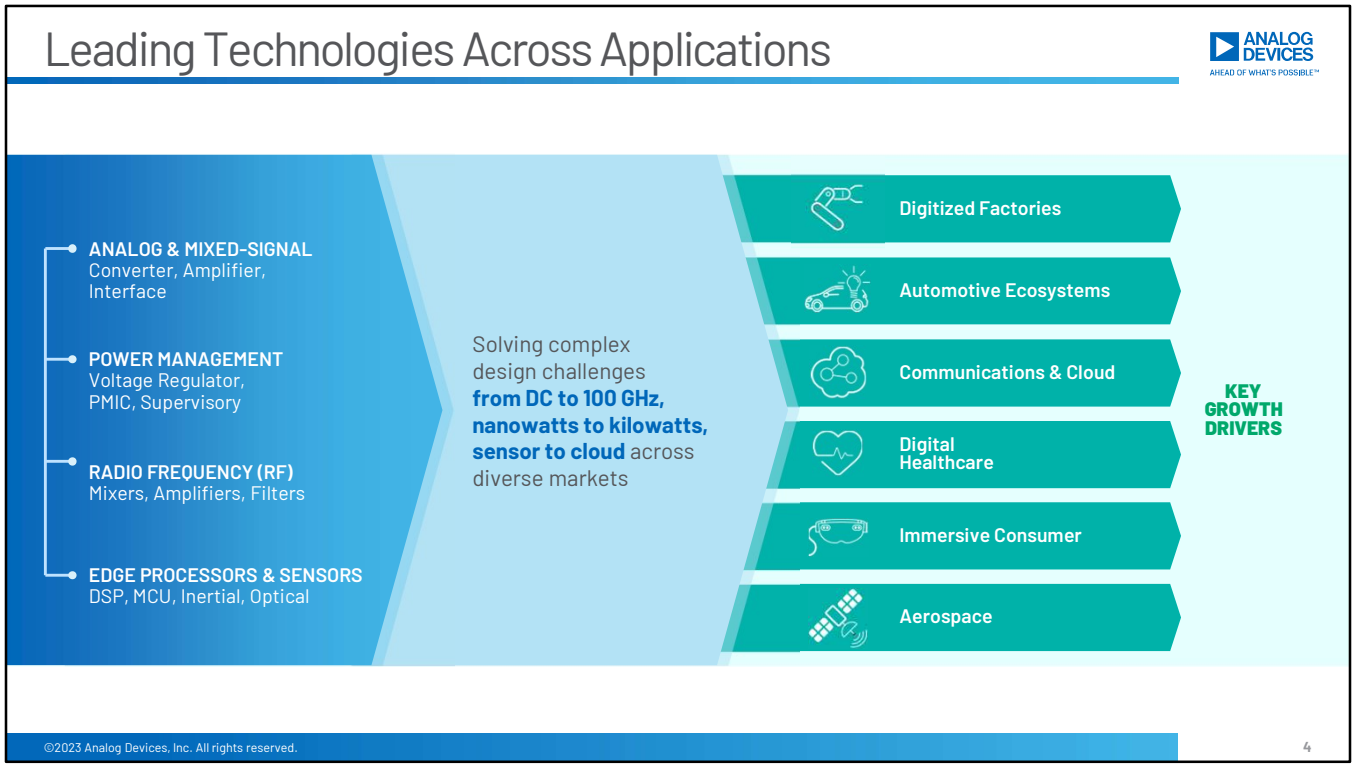
- Free, open-source lab exercises on basic circuits, data conversion (A to D and D to A), amplifiers, filters, oscillators, transmission lines, radio, and more.
- Affordable, student-accessible test equipment that is also at home on a professional's lab bench
- A free, complete course on Software Defined Radio for Engineers
- A power electronics learning module that exposes the operation of buck and boost converters, without requiring expensive test equipment
- And an exciting new Artificial Intelligence Microcontroller with Neural Network Accelerator, bringing modern computer science to the physical world.

We will have hardware on hand for live demos, and will encourage active discussion during the session.

Creating a **More Connected, Safer, and Sustainable Future**



1. Information as of end of fiscal year 2022


Leading Technologies Across Applications
ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™
ANALOG & MIXED-SIGNAL
Converter, Amplifier, Interface
POWER MANAGEMENT
Voltage Regulator, PMIC, Supervisory
RADIO FREQUENCY (RF)
Mixers, Amplifiers, Filters
EDGE PROCESSORS & SENSORS
DSP, MCU, Inertial, Optical
Solving complex design challenges from DC to 100 GHz, nanowatts to kilowatts, sensor to cloud across diverse markets
Digitized Factories
Automotive Ecosystems
Communications & Cloud
Digital Healthcare
Immersive Consumer
Aerospace
KEY GROWTH DRIVERS
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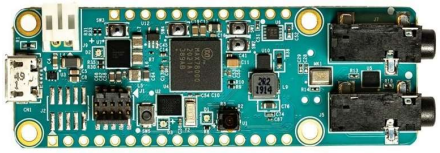
4

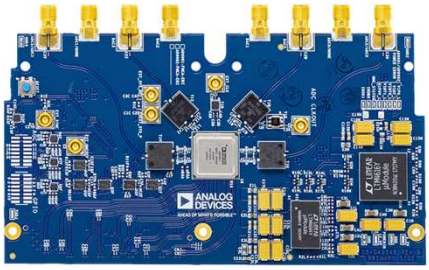
Analog Devices: Just analog, right?

...Wrong!

- ADR1001 Ovenized voltage reference
  - Hairdryer and multimeter experiment
- MAX78000 A.I. uC w/ Convolutional neaural network
  - Handwriting, facial recognition on a tiny microcontroller, at the "intelligent edge"
- Apollo Mixed Signal Front End
  - 20Gsps ADC, 28Gsps DAC
  - Software-defined Radio
  - Digital Signal Processing

And everywhere in between – devices, software drivers, applications, network connectivity, and that's just to start





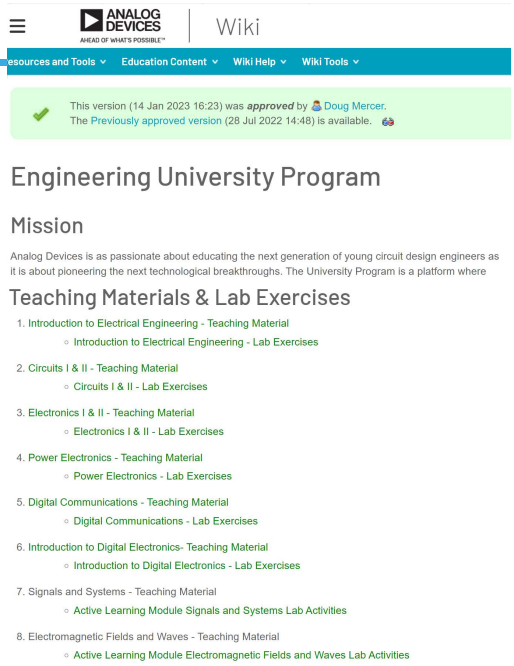
ADI University Program Goals

- ADI University Program goals
  - "**Bridge the gap between academia and industry, drive innovation through collaborative research and education, and empower the next generation of engineers and scientists to solve the world's toughest challenges, creating a better future for all.**"
  - But "keeping it real", we're selfish: Ensure a steady flow of analog engineers for our own selfish purposes, accepting that everyone benefits (even future competitors).

- **Presentation Goals**:
  - Present a broad overview of ADI's educational material
  - Stimulate the imagination for additional labs, instruments, etc. Please ask questions, make suggestions for what more ADI can do.

University Program Elements

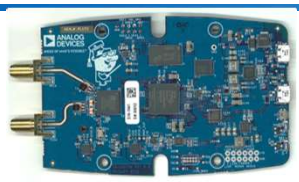
- Content! (Labs, Lessons, Tutorials)
  - wiki.analog.com/university
- Educational Modules (Test Instruments, "lesson on a board")
- Ltspice
- Senior design / thesis projects: Another use for eval boards and reference designs
- And of course, parts: Op-amps, regulators, ADCs, DACs, etc.



Affordable (but good) instruments

- Courseware
- >100 Active Learning Module Lab Activities
  - Circuits I & II
  - Electronics I & II
  - Power
  - Communications
- Instructional Videos
- "Virtual Classroom" EngineerZone Community
  - Help and Guide Students in their Learning Experience
  - Includes:
    - Blog Posts from ADI Staff
    - Document Sharing
    - Discussion
    - Questions

ADALM-PLUTO for Junior – Senior – Grad Level Communications Labs



$230

- The easy to use ADALM-PLUTO active learning module (PlutoSDR) introduces the fundamentals of
  - Software-defined radio (SDR)
  - Radio frequency (RF)
  - Wireless communications
- Helps develop a foundation in real-world RF and communications

	Pluto
Target user	Junior - Senior
Design	Open
RX/TX	1/1
Frequency Range	325 MHz to 3.8 GHz
TRX	AD9363
FPGA	Zynq Z-7010
Connectivity	MATLAB, GNURadio, etc
Channel bandwidth	200kHz - 20 MHz
Cost	$149

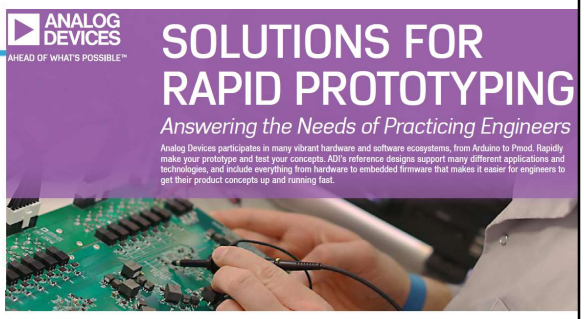
Textbook + Labs
Software-Defined Radio For Engineers

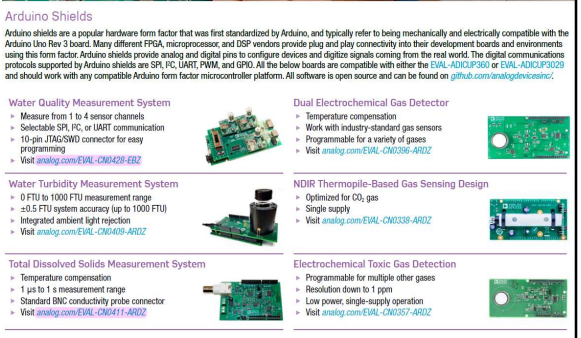
Kit Includes
- 1 x ADI PlutoSDR active learning module
- 2 x antenna (824~894 MHz/1710~2170 MHz)
- 1 x 15 cm SMA cable
- 1 x USB cable

5 July 2023 9

Reference Designs and Eval Boards: Academic project "enablers"

- Diverse applications:
  - Thermocouples
  - Gas detection
  - pH, Turbidity, Fluorescence
  - Strain gauge
- Typically Pmod or Arduino
- Typically include software examples
- Lets students focus on the important aspects of their projects





LTspice What's the point?

- Is it a "Sanity Check"? (No, see a therapist.)
- "That is how you verify the design" (No, you do that on the bench)

- So what is the point?

"The point of simulation is so you understand your circuit better…To develop intuition… There is no way to understate the value of cultivating intuition about how your circuit works."

https://www.youtube.com/watch?v=x6TrbD7-lwU

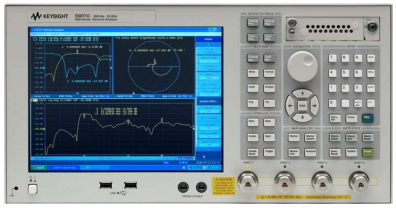
LT Spice with Mike Engelhardt

And it's FREE!

Transmission Lines and Standing Waves with LTspice and low-cost materials

- Challenges making hands-on lab on wave propagation labs
  - TDRs are expensive
  - Fast scopes and network analyzers are expensive
  - You can use slow equipment… (if you have kilometers of cable!)

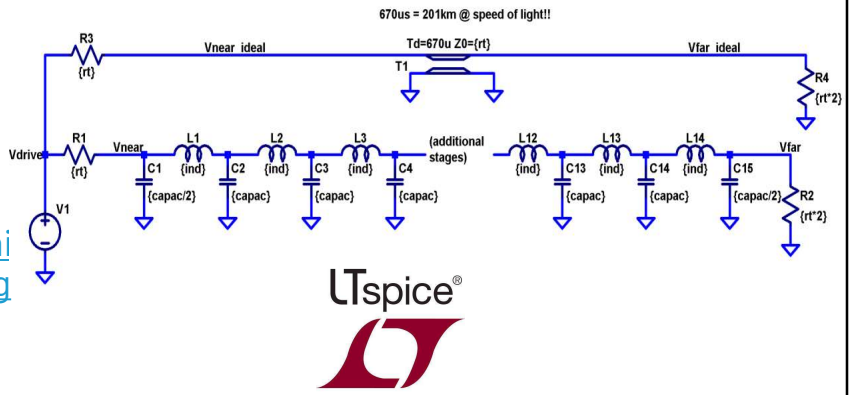
Keysight E5071C



300m RG58 ≈ 1µs
(for $130)

Kitchen Table Solution: Pringles Can and LTspice

- Establish similitude between simulation and something you can touch
- Trust that the LTspice simulation will hold for faster situations who's measurement exceeds the student's test equipment budget
- Full Writeup: https://wiki.analog.com/university/labs/tlines_standing_waves_adalm2000



LTspice®

5 July 2023
13

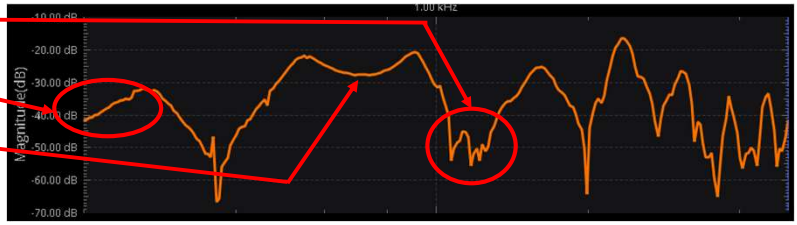
- URL: https://wiki.analog.com/university/labs/tlines_standing_waves_adalm2000

Scopy Network Analyzer vs. LTspice

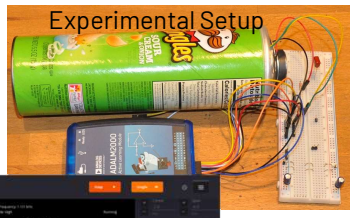
Resonance in metal cap (changes with thumb pressing)

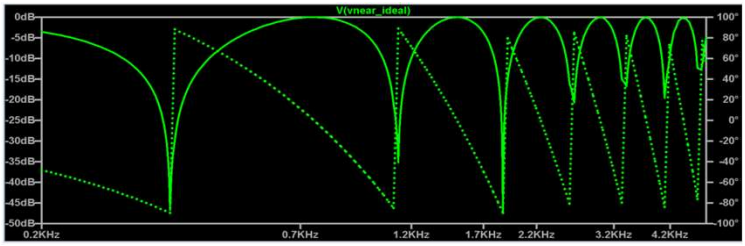
Speaker response lower limit

Who Knows? (Any acoustics experts in the audience?)



Experimental Setup





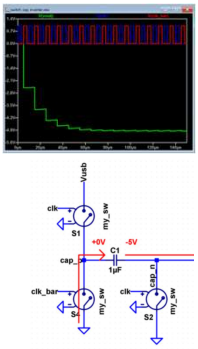
LTspice simulation

Same Model Applied to Switched Cap Power Supplies

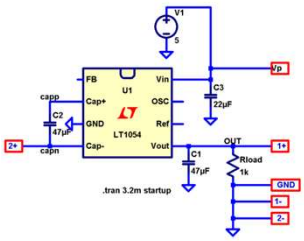
- https://wiki.analog.com/university/courses/electronics/switched-cap-power-supplies
- Objectives:
  - First exposure to the idea of storing energy
  - First exposure to a switching regulator of any type.
  - Introduction to LTspice
- Why LT1054, of all parts?
  - Slow (25kHz), will work on solderless breadboard
  - Versatile – demonstrates inverter, doubler, and a very silly buck

Hands-On

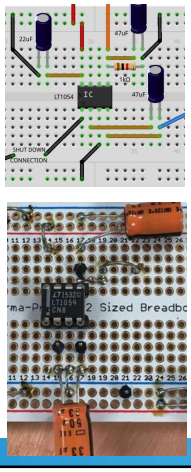
LTspice Theory



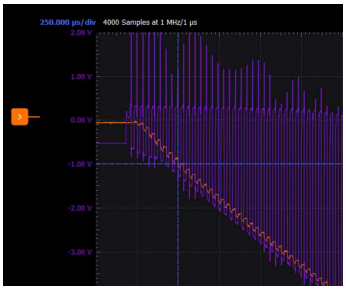
LTspice Circuit Simulation



Breadboarding and construction

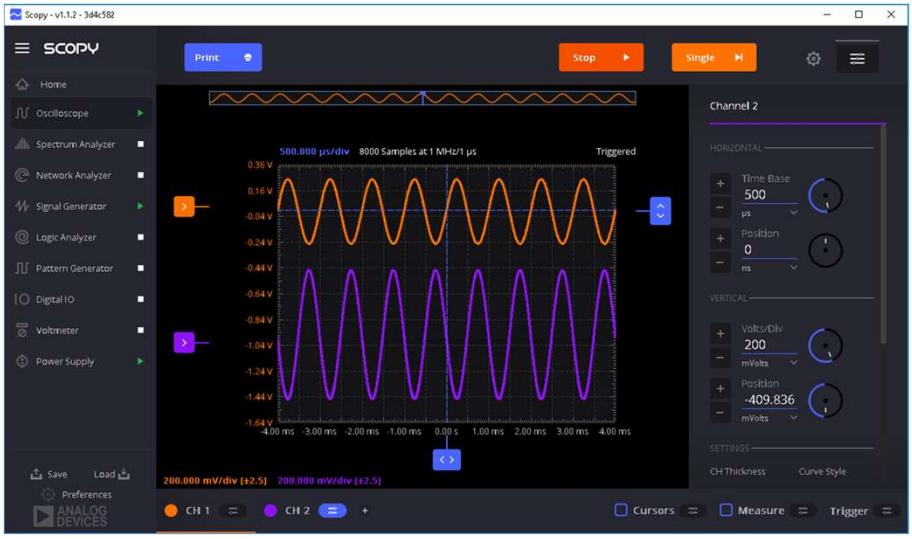


Instrumentation and Measurements



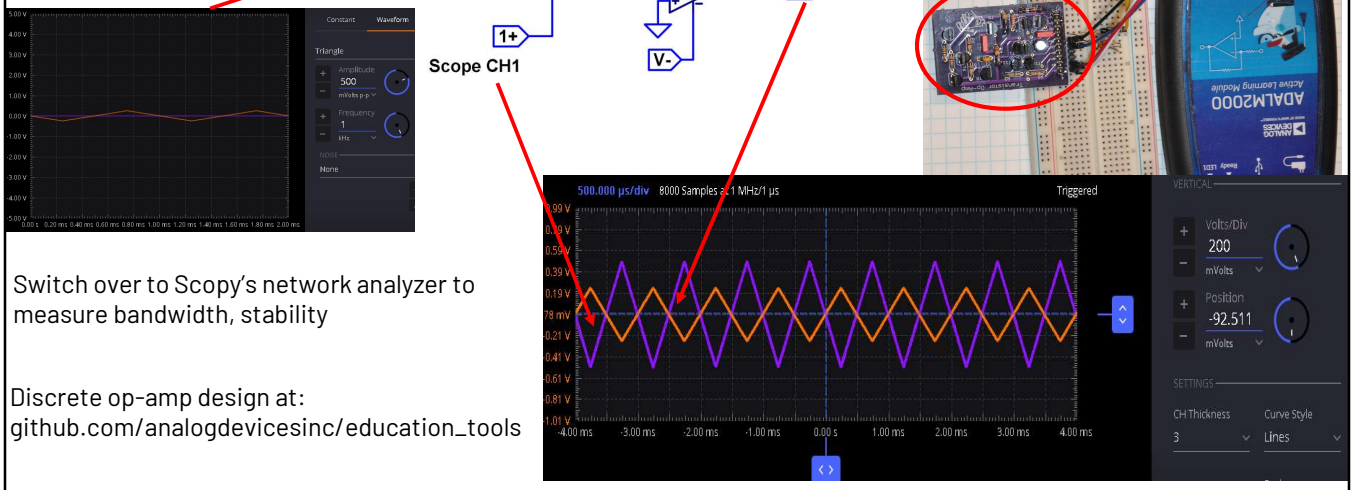
ADALM2000: Instruments and Scopy GUI

- Runs on Windows, Linux, Mac, Android
- Oscilloscope
- Spectrum Analyzer
- Network Analyzer
- Signal Generator
- Logic Analyzer
- Digital Pattern Generator
- Digital I/O
- Voltmeter
- Power Supply (+/- 5V@50mA)



ADALM2000 "Traditional Use"

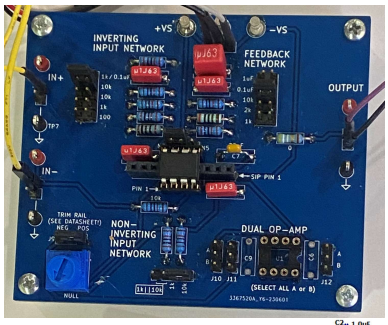
Use scope, signal generator to test op-amp in gain of -2



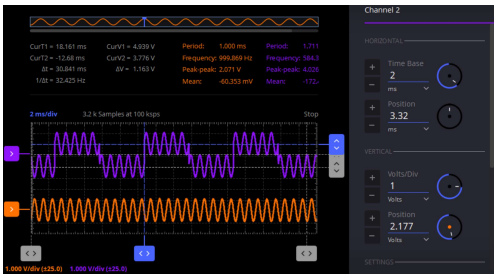
Switch over to Scopy's network analyzer to measure bandwidth, stability

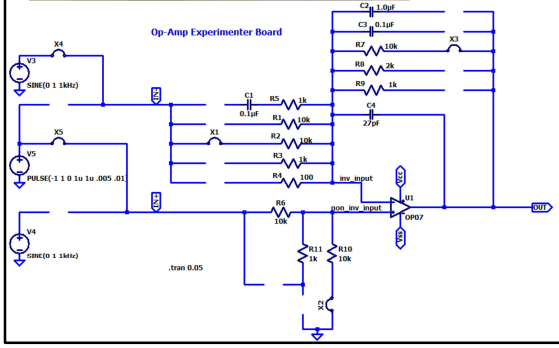
Discrete op-amp design at:
github.com/analogdevicesinc/education_tools

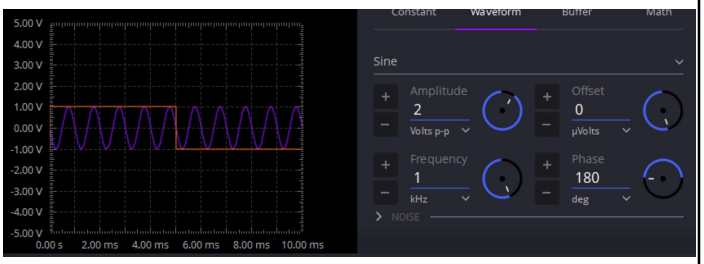
An Experiment in Breadboard Debug Mitigation



- Inverting, noninverting, difference, differentiator, integrator
- Design files on GitHub (see speaker notes below), cheaper to order yourself ☺





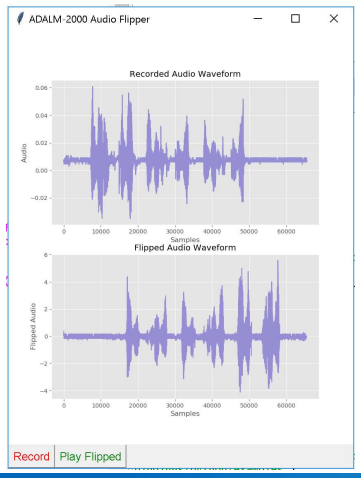


5 July 2023
18

- Op-Amp Experimenter board files: https://github.com/mthoren-adi/education_tools/tree/op-amp-experimenter/experiment-boards/op_amp_experimenter
- Op-Amp Experimenter Ltspice sim: https://github.com/mthoren-adi/education_tools/tree/op-amp-experimenter/m2k/ltspice/op_amp_experimenter
- Discrete op-amp exercise: https://wiki.analog.com/university/courses/electronics/electronics-lab-13
- Video: https://www.youtube.com/watch?v=zzXmWyu_rVM

Scopy getting in the way? Libm2k!

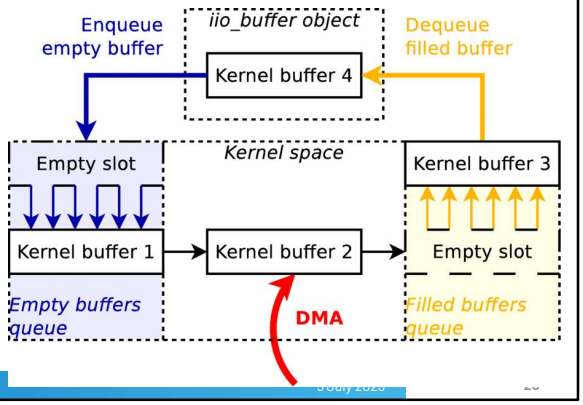
- ADALM2000 for Computer Science and DSP? You bet!
- Full-featured API, cross platform native C library
- Python and C# bindings (MATLAB possible)




```
ctx=libm2k.m2kOpen()
ain=ctx.getAnalogIn()
aout=ctx.getAnalogOut()
ain.setSampleRate(1000000)
ain.setOversamplingRatio(133) # compensate for DAC sample rate
ain.setRange(1,-1,1)
data = ain.getSamples(2**16) # grab a buffer of data
aout.setSampleRate(0, 7500) # Set output sample rate
audio = data[1]
dc = np.convolve(audio, (np.ones(64)/64.0), mode='same') #FIR filter
audio = audio - dc # DC baseline restore
audio [0:100] = [0]*100 #get rid of filter edge effect
audio = np.flip(audio) # Here's where the flip happens!!
audio = audio * 100.0 # add some gain
buffer = [audio, audio]
aout.push(buffer) # Play!
```

ADALM2000 Under the Hood – Open and "Anti-NIH", no proprietary anything

- Built on Xilinx Zynq SoC running embedded Linux (Think: Raspberry Pi/BeagleBone + custom peripherals)
- Same infrastructure used to support ADI customers
- Translation: This is **real, industrial computer science**, not a one-off science project.
- Source code provides fodder for lessons in:
  - FPGA programming
  - FIFOs/DMA
  - Computer Networking
  - Embedded systems in general
- All of this applies to ADALM-PLUTO, too.

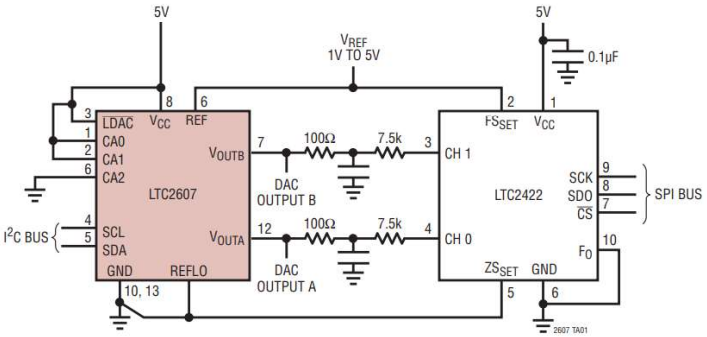


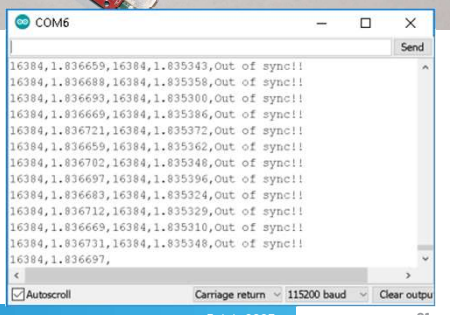
ADALM2000 for Embedded Debug

"But I got the Arduino library from the INTERNET! Why isn't it working?"

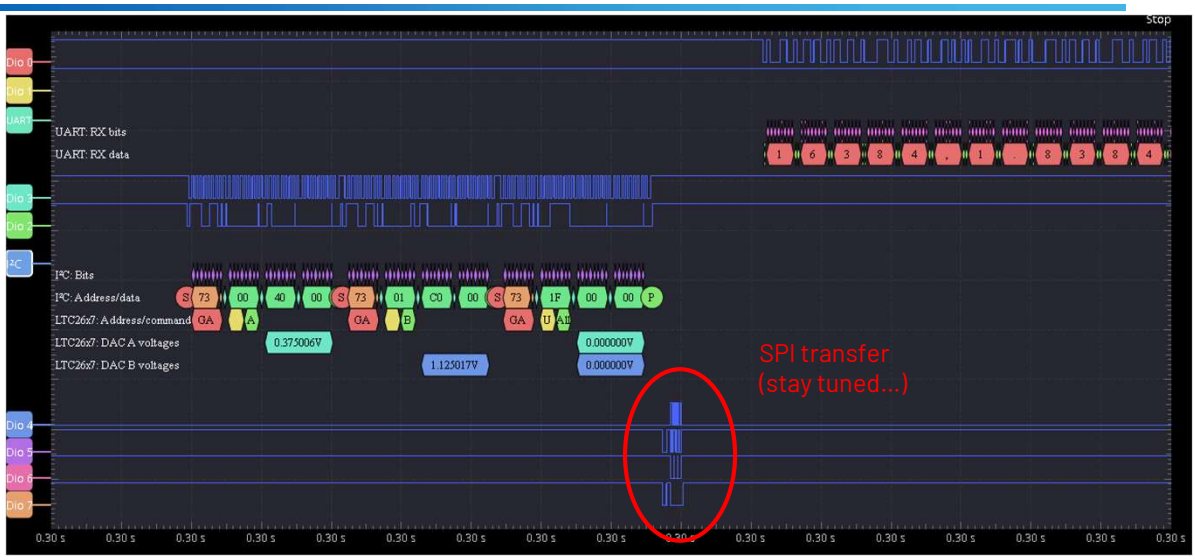
(Have you looked at the actual bus traffic?)

Contrived example: Arduino + LTC2607 I2C DAC, LTC2422 SPI ADC, UART



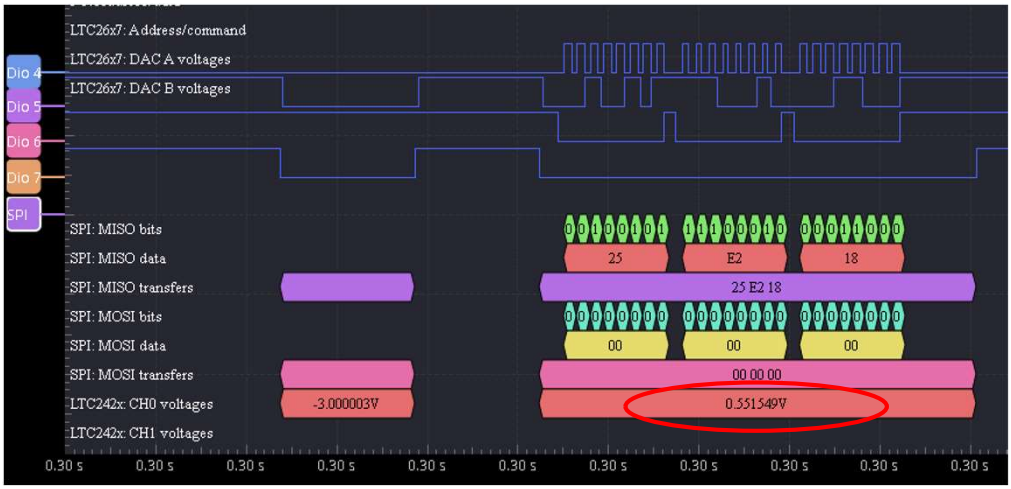


Sigrok UART, I2C decoders, LTC2607 stacked decoder (upstreamed)



- DAC output displayed in human-readable volts

Sigrok SPI decoder, LTC2422 stacked decoder (upstreamed)



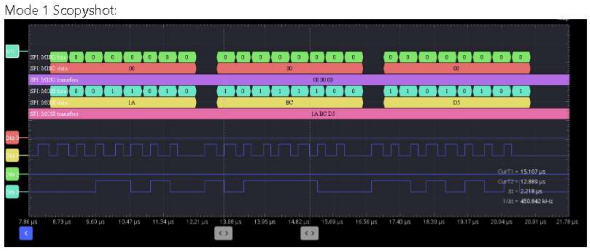
- ADC input displayed in human-readable volts

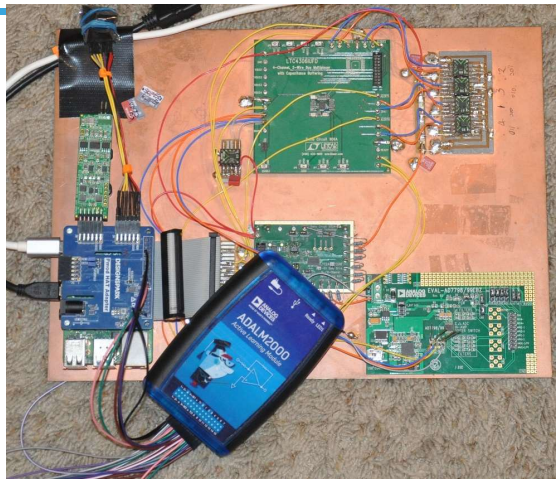
Yes, it's usable "in real life" (Popular tool for field engineers)

- Uncovered SPI mode issue in AD5791 Linux device tree while testing with Raspberry Pi
- Zoomed right into the issue w/ M2K+Scopy

Confirmed that modes 1(spi-cpha) and 2 (spi-cpol) work, modes 0 (none) and 3 (spi-cpha, spi-cpol) don't. I suppose it's a somewhat arbitrary choice between mode 1 and 2, any objection to keeping as-is? (mode 1, spi-cpha)

Mode 1 Scopyshot:

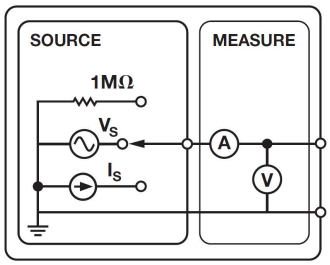


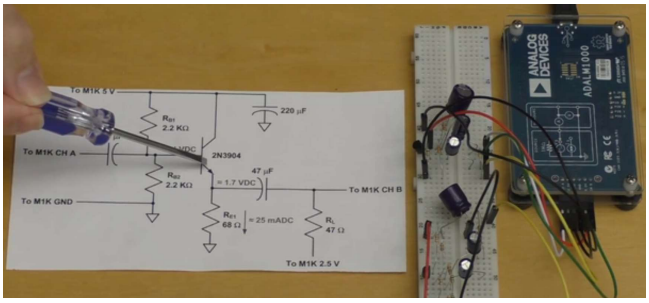


Sheet O' Copper Clad Linux Device Driver Test Bed

ADALM1000: $70 SMU for basic electronics

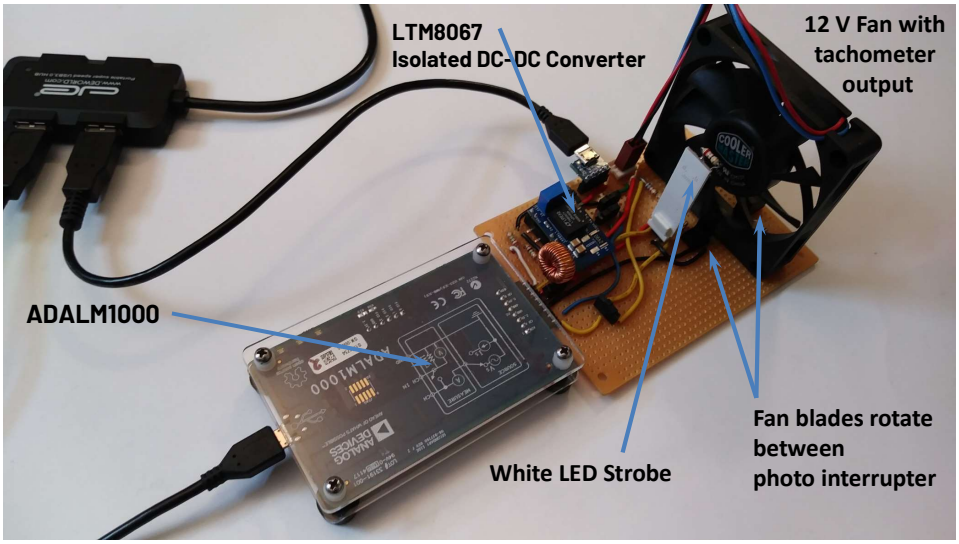
- Measure Voltage
- Source Voltage/Measure Current
- Source Current/Measure Voltage
- 100ksps Oscilloscope
- 100ksps Function Generator
- 16-bit accuracy
- C/C++/Python/MATLAB support





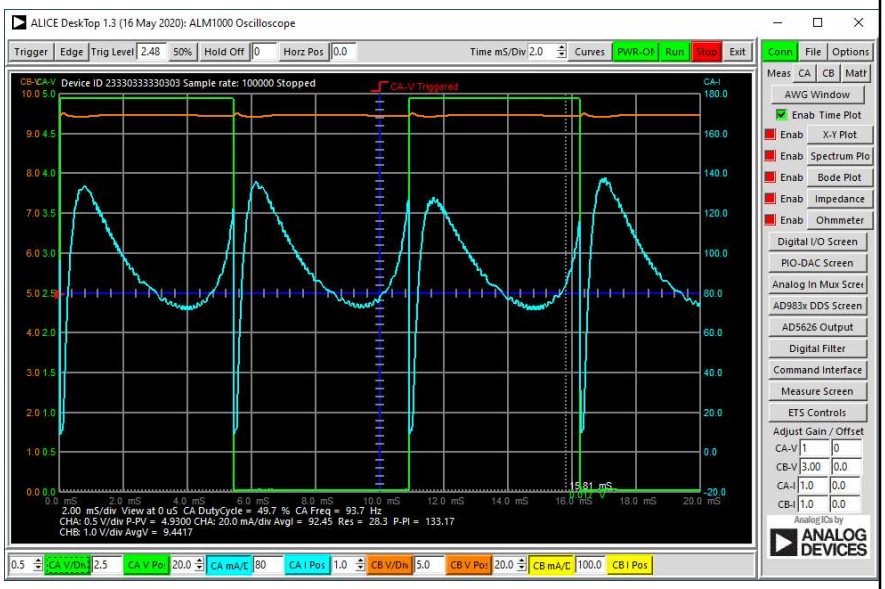
Example: ADALM1000 Measuring Instrumented Brushless Fan Motor

DC-DC converter module input is powered from extra USB port on powered hub. DC-DC converter (adjusted to output 5 V) negative output connected to channel A output. DC-DC converter positive output powers 12 V fan. Channel B output drives LED strobe. Motor current waveform measured on channel A output, Fan Tach or blade photo interrupter (switchable) measured on AIN , Fan voltage (sum of CH A and DC-DC output) measured on BIN (3:1 resistor divider).



Multiple channel trace ALICE Screen Shots

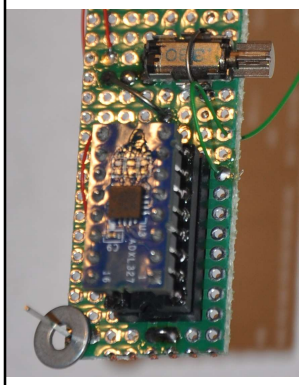
Time scale close up - Green trace is fan Tach output waveform (91Hz). Orange trace is DC voltage on Fan. Light Blue (cyan) trace is motor current, Fan Tach outputs 2 pulses per revolution . Motor current waveform shows 4 pulses of current per revolution. Narrow current spice aligned with Tach rising edge. Hall effect switch for brushless motor commutator also provides Tach output signal.

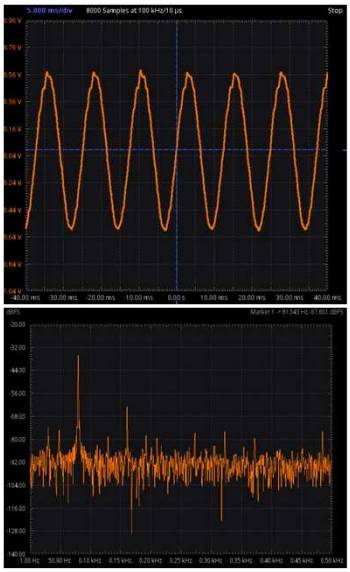


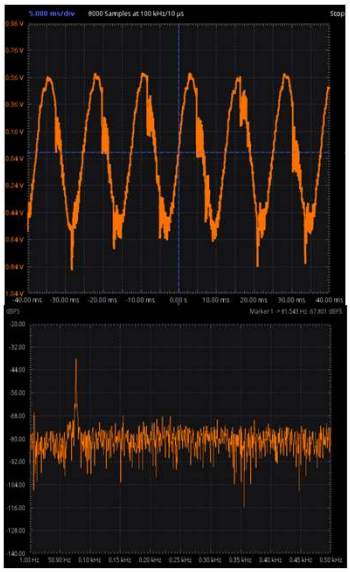
M2K 4 MEs: Vibration Analysis

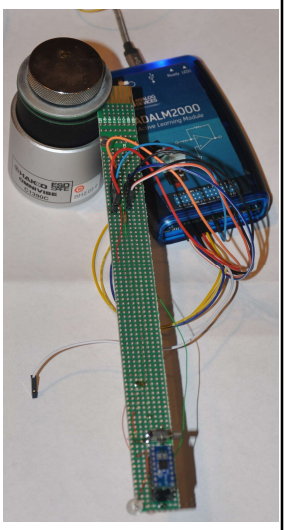
Measure Cell Phone vibrator with ADXL327

Detect "imminent failure" from rattling washer



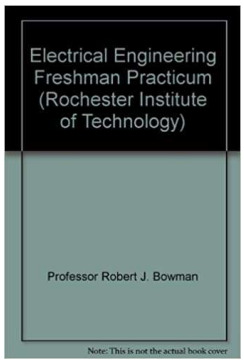


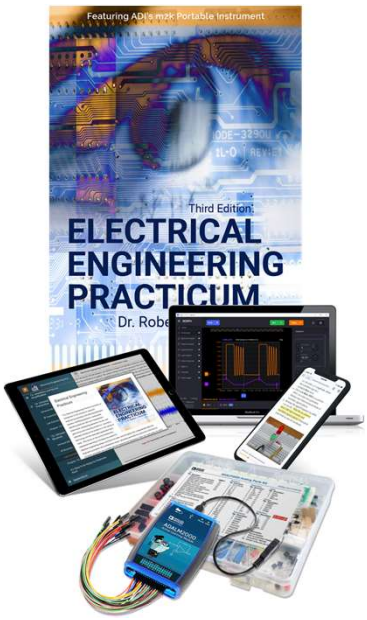




In need of a fully developed freshman lab curriculum?

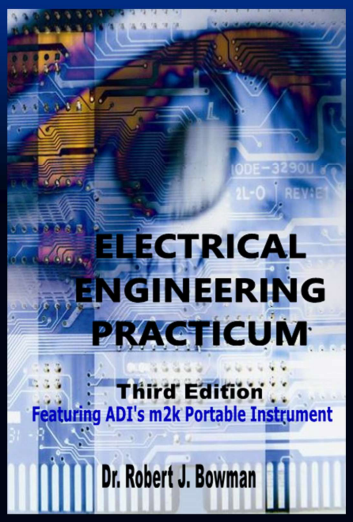
- M2k-based edition Developed by Dr. Robert Bowman, RIT
- First edition, 2009
- Evangelizes student-owned equipment, structured, experiential learning augmented with unstructured exploring





- https://www.trunity.com/trubook-electrical-engineering-practicum-by-robert-j-bowman-3rd-ed.html

Practicum E-Text



Week 1 **Introduction to Electrical Engineering and the Personal Test Lab**
Week 2 **Power Supplies and Electrical Power**
Week 3 **Signal Generators and Waveforms**

Test Instruments

Week 4 **Resistors and Ohm's Law**
Week 5 **Diodes and Rectification**
Week 6 **Capacitors and Time Constants**
Week 7 **Inductors and Resonance**

Circuit Elements

Week 8 **Thermal Sensors and Temperature**
Week 9 **Accelerometers and Tilt Sensing**
Week 10 **Microphones and Sound Sensing**

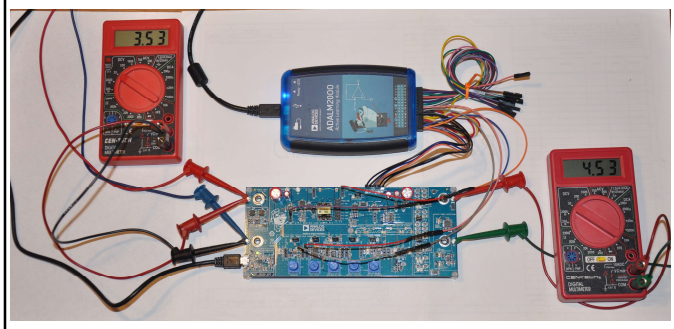
Transducers

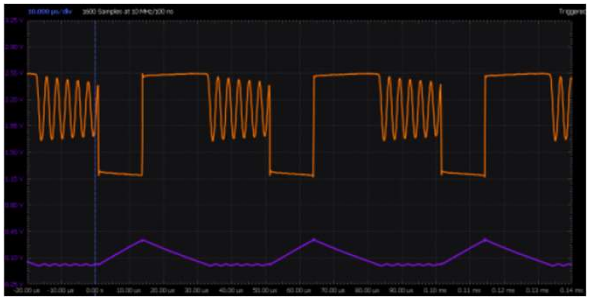
Week 11 **Radio Frequencies and Amplitude Modulation**
Week 12 **Radio Frequencies and Amplitude Demodulation**
Week 13 **Amplifiers and Sound Amplification**
Week 14 **Infrared (IR) Emission and IR Transmitter**
Week 15 **Infrared (IR) Detection and IR Receiver**

Electronic Systems

ADALM-SR1: A Semester's worth of labs in one board

- Breadboards build debugging skill (understatement of the day)
- ADALM-SR1: companion board for a family of power electronics labs
- "Medium-Cost, semester-worth-of-lab boards" might be the way of the future…
- https://wiki.analog.com/university/tools/lab_hw/adalm-sr1



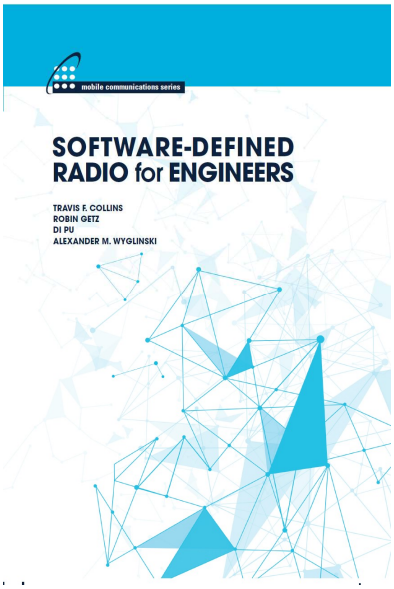


Self-contained – no extra equipment required)

Low-Cost SDR module and FREE SDR Textbook

- Practical textbook for teaching communications theory based on PlutoSDR complete with:
  - Labs:
    - PlutoSDR
    - Carrier and timing synchronization
    - Frame recovery
    - Channel estimation/equalization
    - OFDM
  - Lecture Slides
  - Chapter questions
  - MATLAB code
- Published by Artech House and made available through Analog Devices
- Designed for junior, senior, or early graduates

$230

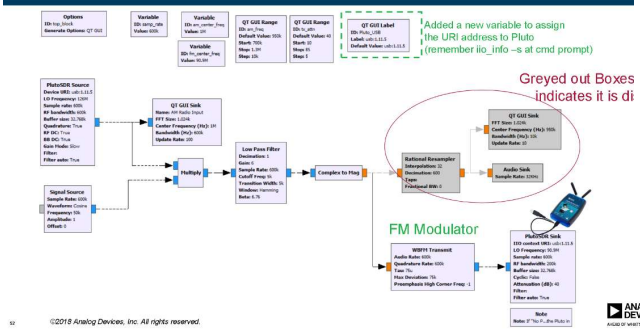


PlutoSDR is a general-purpose SDR tool

AM on an FM Radio using GNURadio: An excellent intro to radio concepts

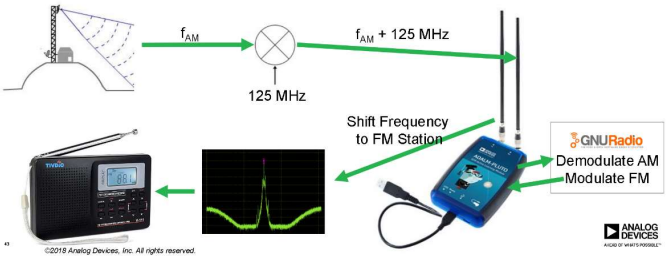
https://github.com/jonkraft/

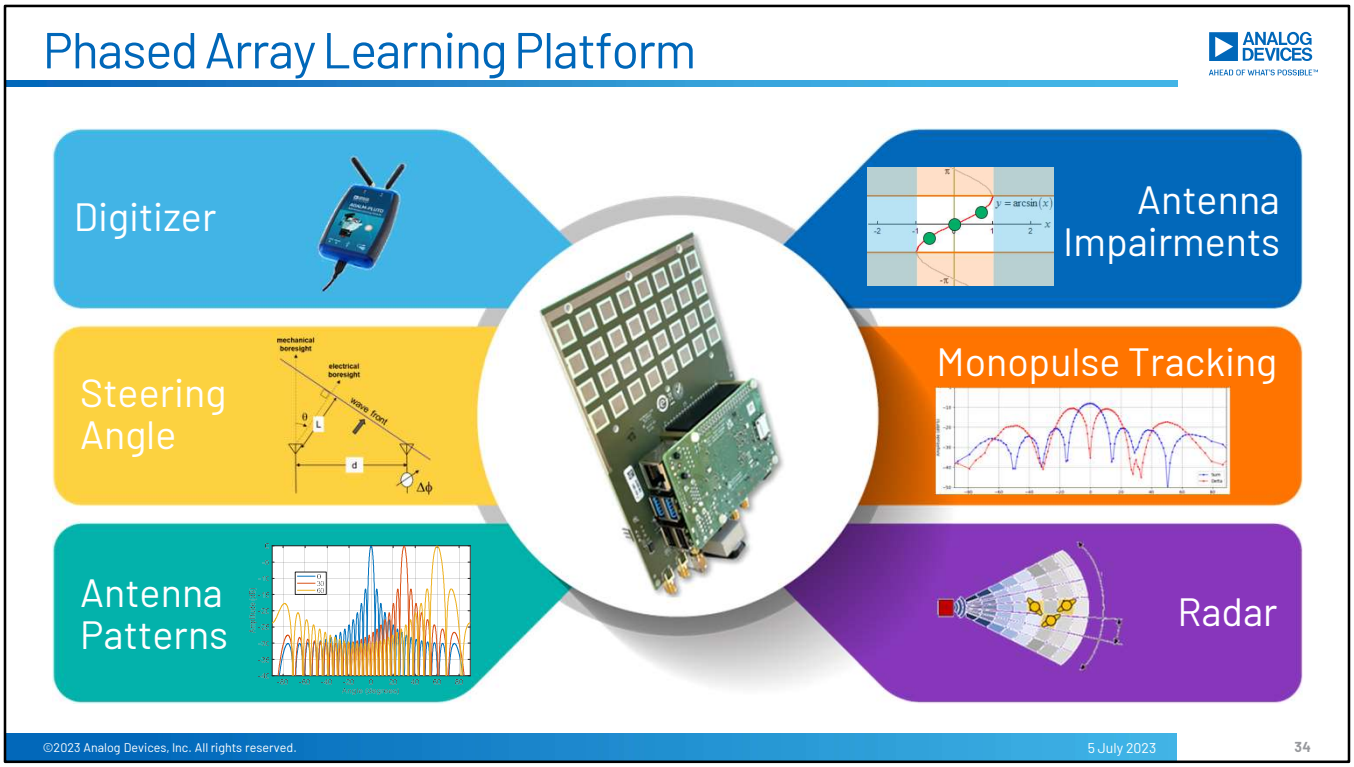
Lab1: GNU Radio Flow Chart



Pluto Lab 1: Play an AM Station on an FM Radio

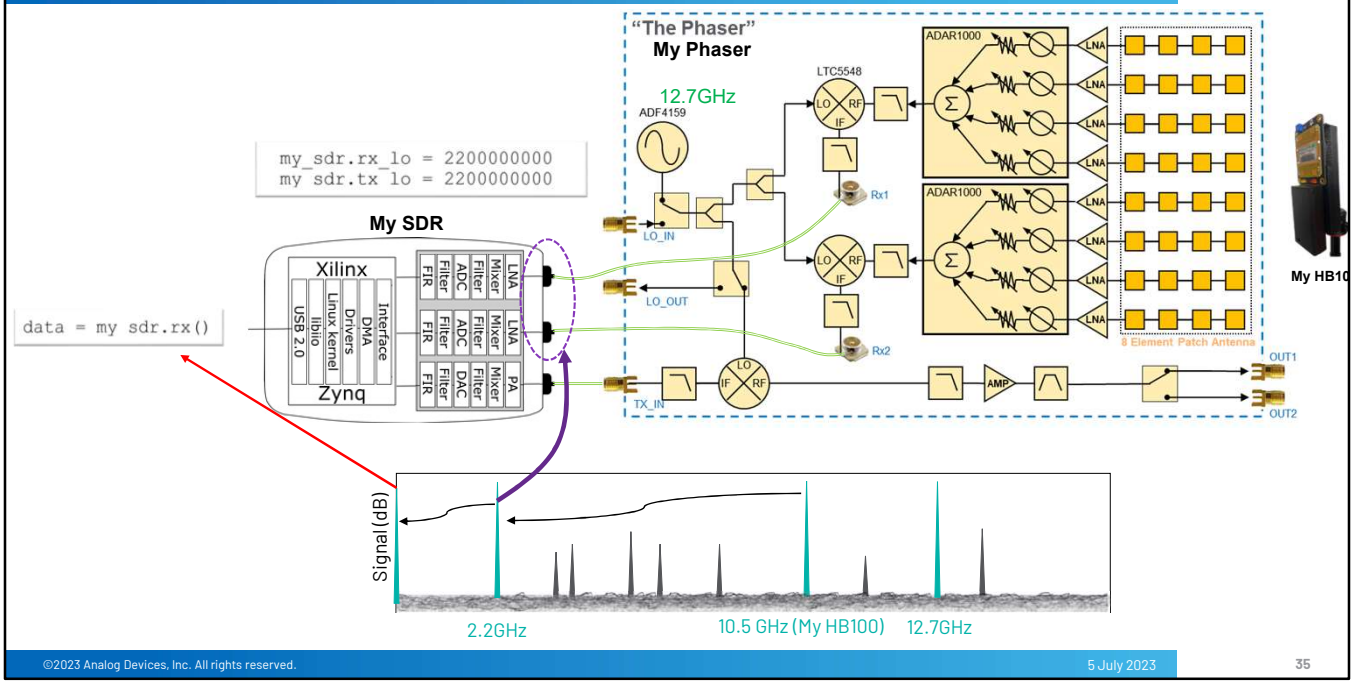
- For this lab, we'll convert an AM station to FM and send it to an FM station that we choose
- AM is around 1000kHz. That's too low for Pluto, so we use a mixer to shift up by 125MHz





- Wiki.analog.com/phaser

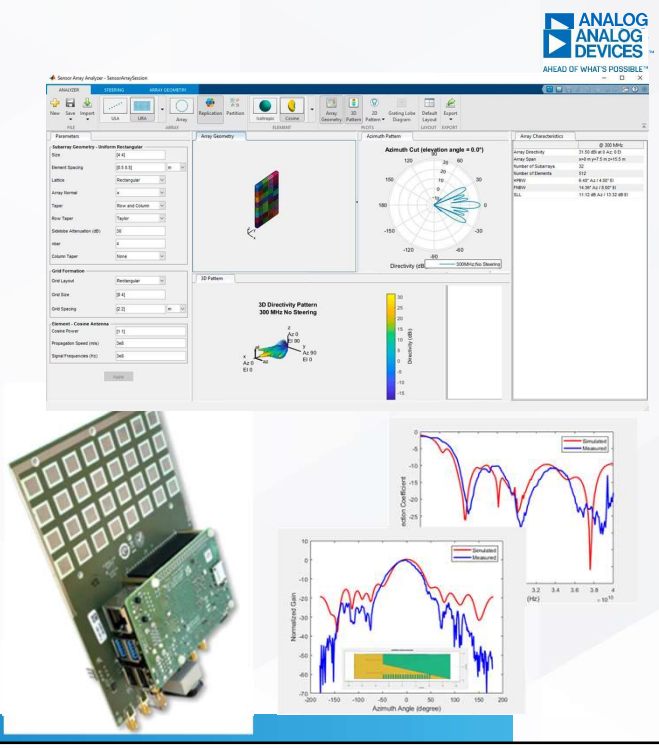
Microwaves to RF to DSP in Python or MATLAB



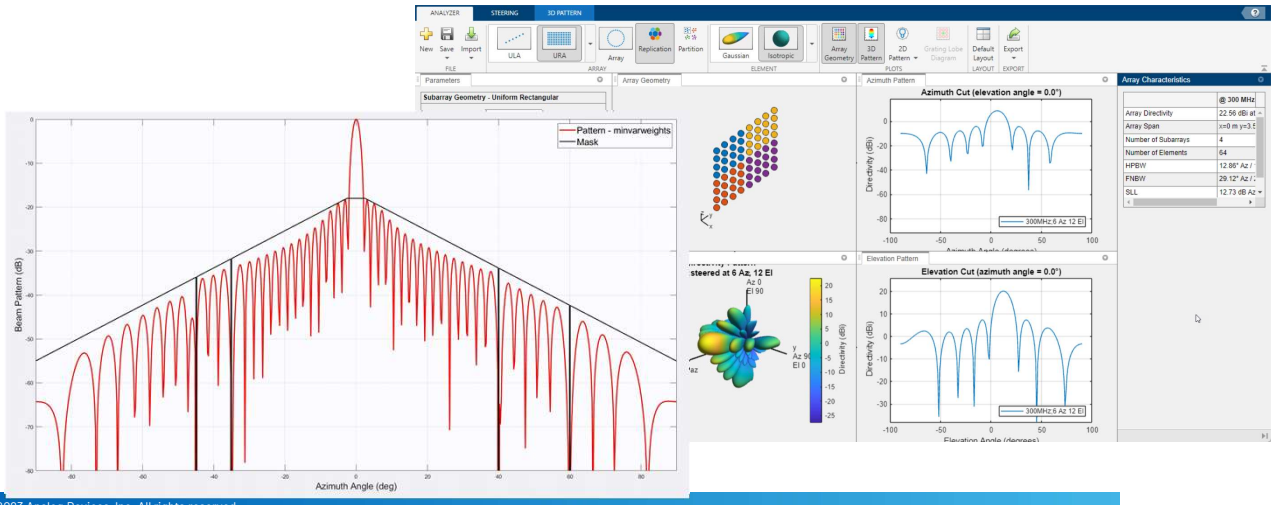
5 July 2023
35

Curriculum Goals

1. Gain an understanding of phased array and beamforming concepts
2. Learn how simulation models can be used to predict array and beam behavior for system design and test
3. Validate simulation models using prototype hardware
4. Learn about practical applications for phased array systems



MATLAB Goal: Establish a Common Design Language and Development Framework



- This is the light cover slide option.

What can you buy and do with >$65?

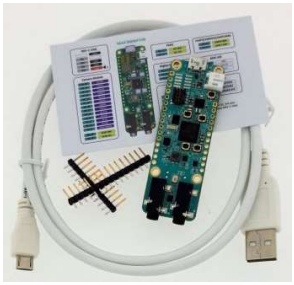
- Buy a Whiskey Kit
- Get Drunk?
- Maybe impress friends with B/Spoke setup

- Buy a Lemon tree
- Make lemonade!
- (much more alstruistic)

- Buy an Uber from Evergreen Museum to here…
- Speak at ASEE events

Or… Learn how to use AI to impact the world!

- A low-cost learning kit focusing on combining embedded and digital worlds
  - Collaboration with Elektor
- Includes MAX78000 development board & required cables
  - Can be purchased separately for **$28.36**
- Includes detailed instruction-based workbook
- Ideal for learning IoT, Edge applications
- Reasonably Priced at $64 for the package
  - Board by itself: $29
  - E-book: $29.81



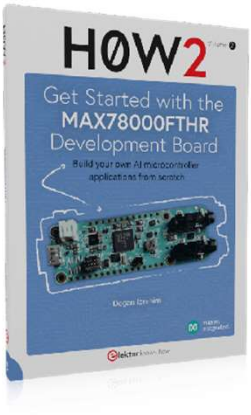
Key Benefits

- Great entry point for working with HW + SW + AI using ADI's award winning micro controller
- The package is great for all learning levels
- Core HW can be expanded and used to develop real-world solutions
  - UT Austin: Student developed Recycler object detection application to sort glass, aluminum, & plastic
  - Univ. ETH Zurich: Using it to monitor parking spaces for the city as opposed to using costly sensor installs
- ADI as an educational partner
  - We are investing in education through our Active Learning Program
  - Great complimentary offering of components and measurement equipment

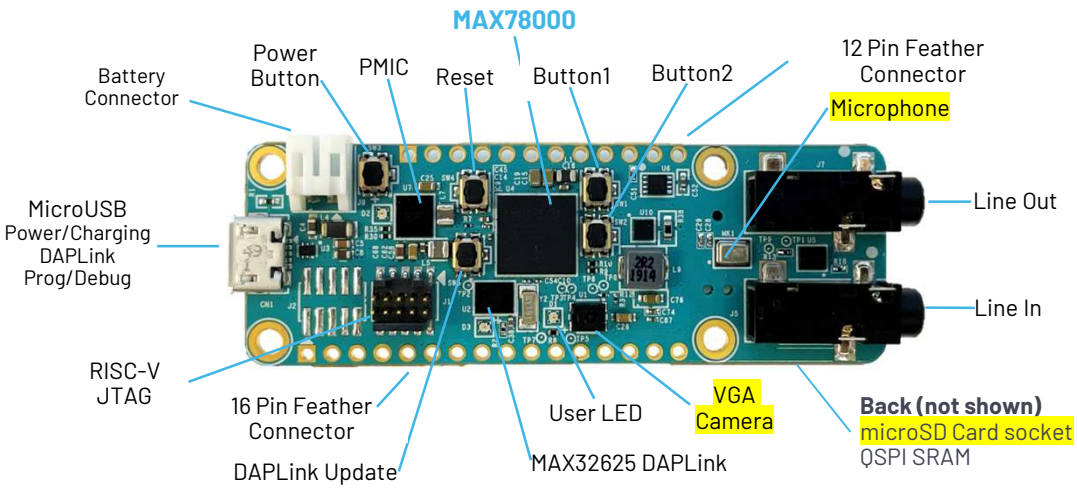
- Delete all instruction slides prior to use and any of the example slides that are not needed.

Elektor HOW2 Package – Workbook Contents

- Tons of great step by step learning modules each concluding with an exercise(s).
  - Creating a C program
  - Hardware projects, "Blink a light", Voice guided LED blinking
  - Modules to learn about ADCs, UART, I2C, SPI, Timers, Pulse Train Engine, TRNG, OWM, I2S, Camera, TFT Display, & more!
  - Using the AI Micro: Play with a Convolutional Neural Network (CNN) on embedded HW and learn how to:
    - Training new keywords (audio, visual)
    - Modeling and synthesis
- Provides
  - Coding examples and references
  - Core learning concepts
  - flows perfectly for instruction or self-learning



Featured board: MAX78000FTHR



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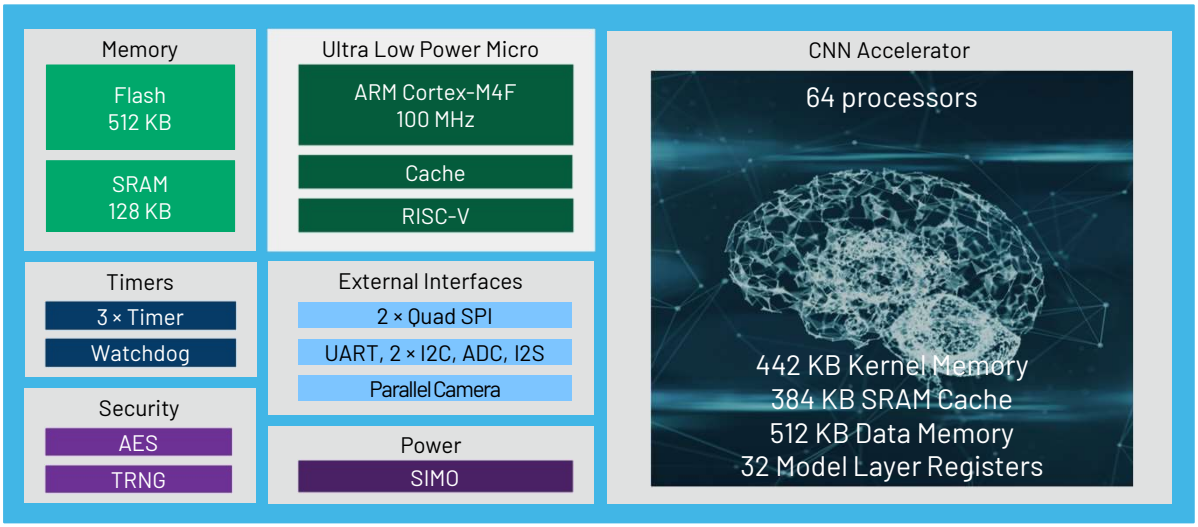
43

MAX78000 AI Micro - System-on-Chip

ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

- Get to work with ARM M4/RISC-V Co-Processors



MAX78000FTHR- Pre-loaded to go!

When connected to a PC:

- Recognized as composite USB device
- DAPLINK, WebUSB, CMSIS, Mass storage device, & Serial Port
- Pre-loaded with audio keyword spotting demo which students can manipulate in later exercises
  - Recognizes 0-9, Go, Stop, Left, Right, Up, Down, On, Off
  - Once "Go" starts program, LED will blink number spoken
- Free SDK (instructions in workbook)
  - GCC Toolchains for ARM and RISC-V processors
  - Eclipse ICD (C/C++)
  - MinGW

Direct from the workbook – detailed component info

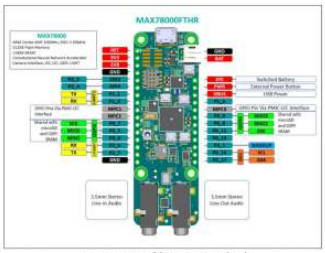


Figure 1.1 Top view of the MAX78000FTHR board

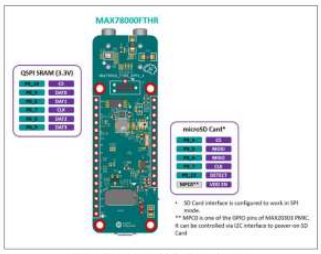


Figure 1.2 Bottom view of the MAX78000FTHR board

1.3 • Pushbuttons and LEDs

There are 5 pushbuttons (named **SW1** to **SW5**) and 3 RGB LEDs (named **D1** to **D3**) on the board as shown in Figure 1.3.

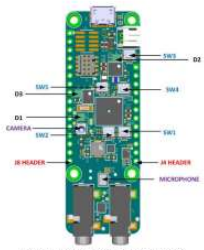


Figure 1.3 Pushbuttons and LEDs on the board

The functions of the pushbuttons are:

SW1: User-programmable function button connected to the MAX78000 Port 0_2 through a debouncer IC.

SW2: User-programmable function button connected to the MAX78000 Port 1_7 through a debouncer IC.

SW3: PMIC Power Button. When the board is in a powered-on state, pressing this button for 12 seconds performs a hard power-down. When the board is in a powered-off state, pressing this button powers on the board. This button can also be read by the MAX78000 firmware, PMIC_PFN2 signal connected to Port 3_1 is a buffered input of the button status. When the button is pressed, this signal goes to a logic-low state.

SW4: Resets the MAX78000 through the RSTN input of the MAX78000.

Direct from the workbook – Pinout Descriptions

SW5: DAPLink adapter button. Keep this button pressed while applying power to the board to put the MAX32625 DAPLink adapter onboard to MAINTENANCE mode for DAPLink firmware updates.

The functions of the LEDs are:

D1: Connected to the MAX78000 GPIO ports. This LED can be controlled by user firmware.

Port 2_0 : Red
Port 2_1 : Green
Port 2_2 : Blue

D2: Connected to MAX20303 PMIC LEDx outputs. These LEDs can be controlled through I2C commands. They also can be configured as charge status indicators by issuing I2C commands.

D3: DAPLink adapter MAX32625 status LED. Controlled by the DAPLink adapter and cannot be used as a user LED.

1.4 • GPIO Pinout

There are two headers at either side of the board where GPIO signals are terminated. As shown in Figure 1.3, **Header J4** has 12 pins and **Header J8** has 16 pins. The board includes the following GPIO port pins:

PORT0: P0_5, P0_6, P0_7, P0_8, P0_9, P0_11, P0_16, P0_17, P0_19
PORT1: P1_0, P1_1
PORT2: P2_3, P2_4, P2_6, P2_7
PORT3: P3_1

Tables 1.1 and 1.2 show the J4 and J8 pin names and their descriptions. Notice some pins are shared. For example, P1_0 and p1_1 are shared with the UART RX and TX pins respectively. Similarly, P2_3 and P2_4 are shared with analog inputs AIN3 and AIN4 respectively.

PIN	NAME	DESCRIPTION
1	SYS	SYS Switched Connection to the Battery. This is the primary system power supply and automatically switches between the battery voltage and the USB supply when available.
2	PWR	Turns off the PMIC if shorted to Ground for 13 seconds. Hard power-down button.
3	VBUS	USB VBUS Signal. This can be used as a 5V supply when connected to USB. This pin can also be used as an input to power the board, but this should only be done when not using the USB connector since there is no circuitry to prevent current from flowing back into the USB connector.
4	P1_6	GPIO
5	MPC3	GPIO controlled by PMIC through the I²C interface. Open drain or push-pull programmable.
6	P0_9	GPIO or QSPI0 SCK30 signal. Shared with SD card and on-board QSPI SRAM.
7	P0_8	GPIO or QSPI0 SDIO2 signal. Shared with SD Card and on-board QSPI SRAM.
8	P0_11	GPIO or QSPI0 slave select signal.
9	P0_19	GPIO
10	P3_1	GPIO or Wake-up signal. This pin is 3.3V only.
11	P0_16	GPIO or I2C1 SCL signal. An on-board level shifter allows selecting 1.8V or 3.3V operation through R15 or R20 resistors. Do not populate both.
12	P0_17	GPIO or I2C1 SDA signal. An on-board level shifter allows selecting 1.8V or 3.3V operation through R15 or R20 resistors. Do not populate both.

Table 1.1 Header J4 pins

PIN	NAME	DESCRIPTION
1	RST	Master Reset Signal
2	3V3	3.3V Output. Typically used to provide 3.3V to peripherals connected to the expansion headers
3	1V8	1.8V Output. Typically used to provide 1.8V to peripherals connected to the expansion headers
4	GND	Ground
5	P2_3	GPIO or Analog Input (AIN3 channel)
6	P2_4	GPIO or Analog Input (AIN4 channel)
7	P1_1	GPIO or UART2 Tx signal
8	P1_0	GPIO or UART2 Rx signal
9	MPC1	GPIO controlled by PMIC through I²C interface. Open drain or push-pull programmable
10	MPC2	GPIO controlled by PMIC through I²C interface. Open drain or push-pull programmable
11	P0_7	GPIO or QSPI0 clock signal. Shared with SD card and on-board QSPI SRAM
12	P0_5	GPIO or QSPI0 MOSI signal. Shared with SD card and on-board QSPI SRAM
13	P0_6	GPIO or QSPI0 MISO signal. Shared with SD card and on-board QSPI SRAM
14	P2_6	GPIO or LPUART Rx signal
15	P2_7	GPIO or LPUART Tx signal
16	GND	Ground

Table 1.2 Header J8 pins

Direct from the workbook – oodles of guided projects!

ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

Several pre-trained models to manipulate and learn on!

```
// Common Demo Name
#define DEMO_STRING_SIZE                15
#define FACEID_DEMO_NAME                "FaceID"
#define UNET_DEMO_NAME                  "UNet"
#define WILDLIFE_DEMO_NAME              "WildLife"
#define CATSDOGS_DEMO_NAME              "CatsDogs"
#define IMAGECAPTURE_DEMO_NAME          "Image Capture"
```

- Capable of video, audio, and sensory AI applications
- Downloadable content and app notes on GitHub
- Only limitation is creativity and time..... well, and the model size ☺

Links and other info

- Links – Take a picture!
- MAX AI Github: GitHub - MaximIntegratedAI/refdes
- Visit Analog.com and search "MAX78000FTHR"
- **Elektor Kit: https://www.elektor.com/get-started-with-the-max78000fthr-bundle**
- Email: Nathan.frey@analog.com Happy to provide more info!

- Delete all instruction slides prior to use and any of the example slides that are not needed.


Thank You!
Questions?
Email:
Samantha.Fontaine@analog.com
mark.thoren@analog.com
Nathan.frey@analog.com
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AHEAD OF WHAT'S POSSIBLE™
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5 July 2023
51