2024

Community Training Initiative

Anyone can learn LabVIEW Anywhere!

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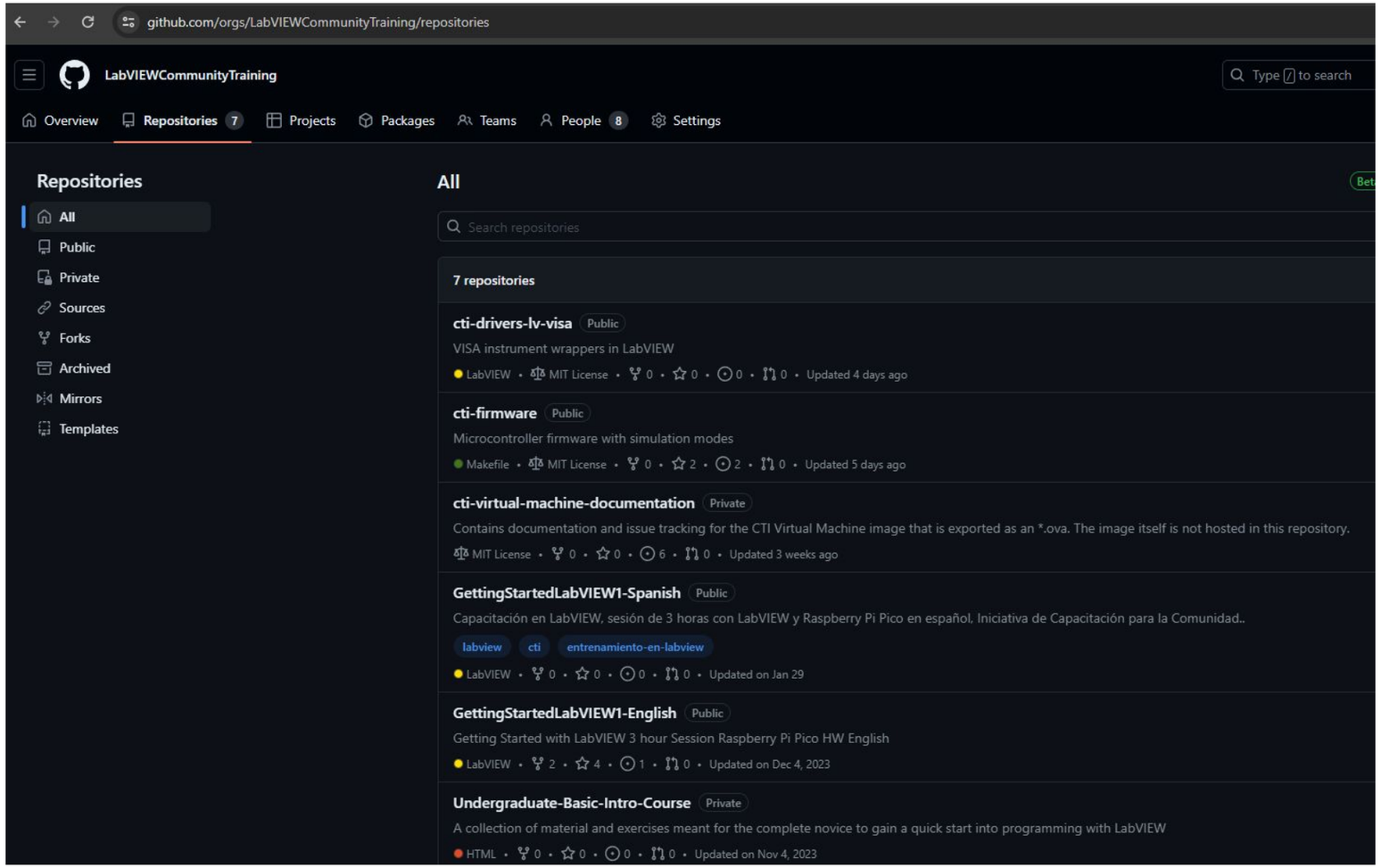
EMERSON | NI

Community Training Initiative (CTI)

Enabling Community Training

CTI is a community driven effort to make it affordable and easy to create, provide, and receive LabVIEW training:

- 100% open source
- Based on affordable hardware
- Simulators for when HW is not available
- Virtual machine image to easily use provided material
- Introductory lessons
- Community provided translations



Why?

NI has given us a fantastic opportunity with the release of LabVIEW Community Edition.

Recently it has had its licensing clarified to be usable for all non-commercial activities including usage by students and for training outside of a commercial environment.

The NI courses are not readily available to everyone and getting started with a standard environment and hardware can still be a hurdle to get over.

The Hobbyist Toolkit (LabVIEW support on Raspberry Pis, Beaglebone Blacks, and APIs for Arduino / other MCUs) has not had new targets added to it since release.

What?

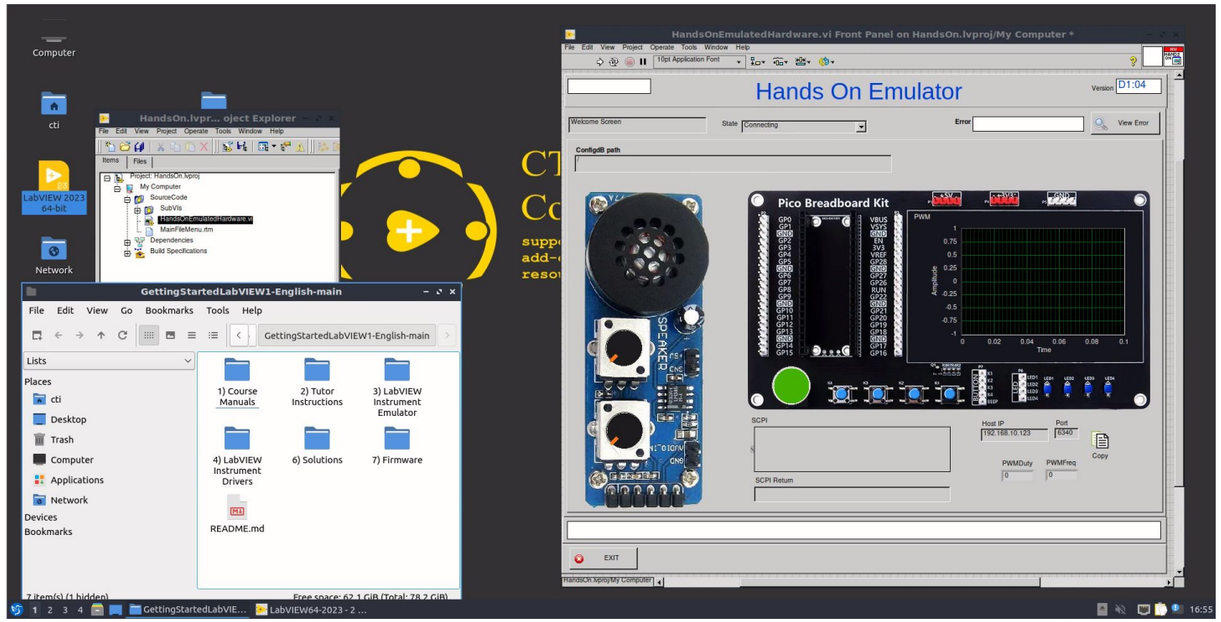
Materials on github - fully open-source with MIT license

OVA - https://en.wikipedia.org/wiki/Open_Virtualization_Format

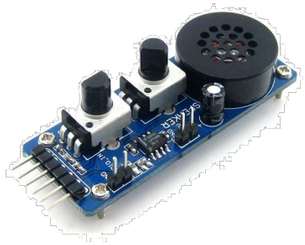
Can be installed VirtualBox, VMWare or KVM.

Linux can be freely distributed with LabVIEW Community Edition and drivers pre-installed.

Raspberry Pi Pico W can be had for $6 ($7 if you don't like soldering headers) - We created a VISA overlay to allow industry standard drivers to be created for Hands-on

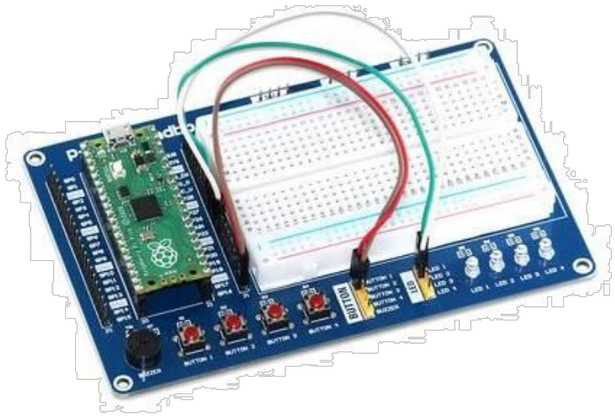


What?



Waveshare Analog Test Board

- https://www.waveshare.com/analog-test-board.htm
- https://thepihut.com/products/analog-test-board



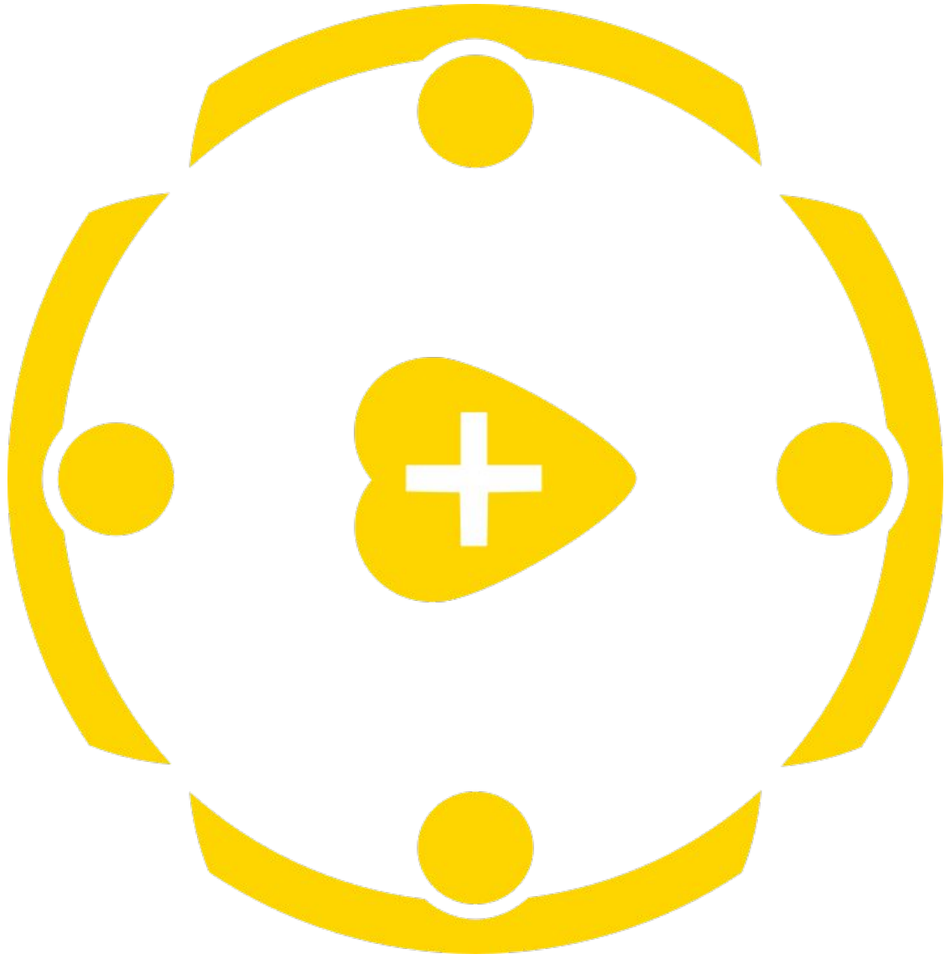
Pico Breadboard Kit

- https://www.pishop.us/product/pico-breadboard-kit/
- https://thepihut.com/products/breadboard-kit-for-raspberry-pi-pico
- https://www.digikey.com/en/products/detail/sb-components-ltd/SKU20843/16836965

Raspberry Pi Pico W

- https://www.digikey.com/en/products/detail/raspberry-pi/SC0918/16608263

Goals



1. Provide a framework for newcomers to LabVIEW to gain experience with LabVIEW development, interacting with hardware, and controlling their own electronics projects.

2. Provide a hardware platform that is usable all the way from training, to hobbyist usage of LabVIEW, to professional projects.

3. Enable community provided training for little-to-no cost to the trainer.

4. Encourage open-sourcing of training materials to help the whole community.

DISCORD

Discord is where the maintainers discuss future plans, hardware support, virtual machine updates, and lesson plans.

Joining the Discord is not necessary to utilize the material but is where all conversations happen.

https://discord.gg/gebRc8A695

GITHUB

Everything is 100% open source on Github.

Customize, extend, translate

- Embedded Firmware
- LV Drivers
- Lesson HW Drivers / Emulator
- Lessons
- Documentation
- Device Manager (Soon™)

https://github.com/orgs/LabVIEWCommunityTraining/repositories

Pi Pico W

LVTTL (3.3V) Signalling

USB device interface

2x UART

2x I2C

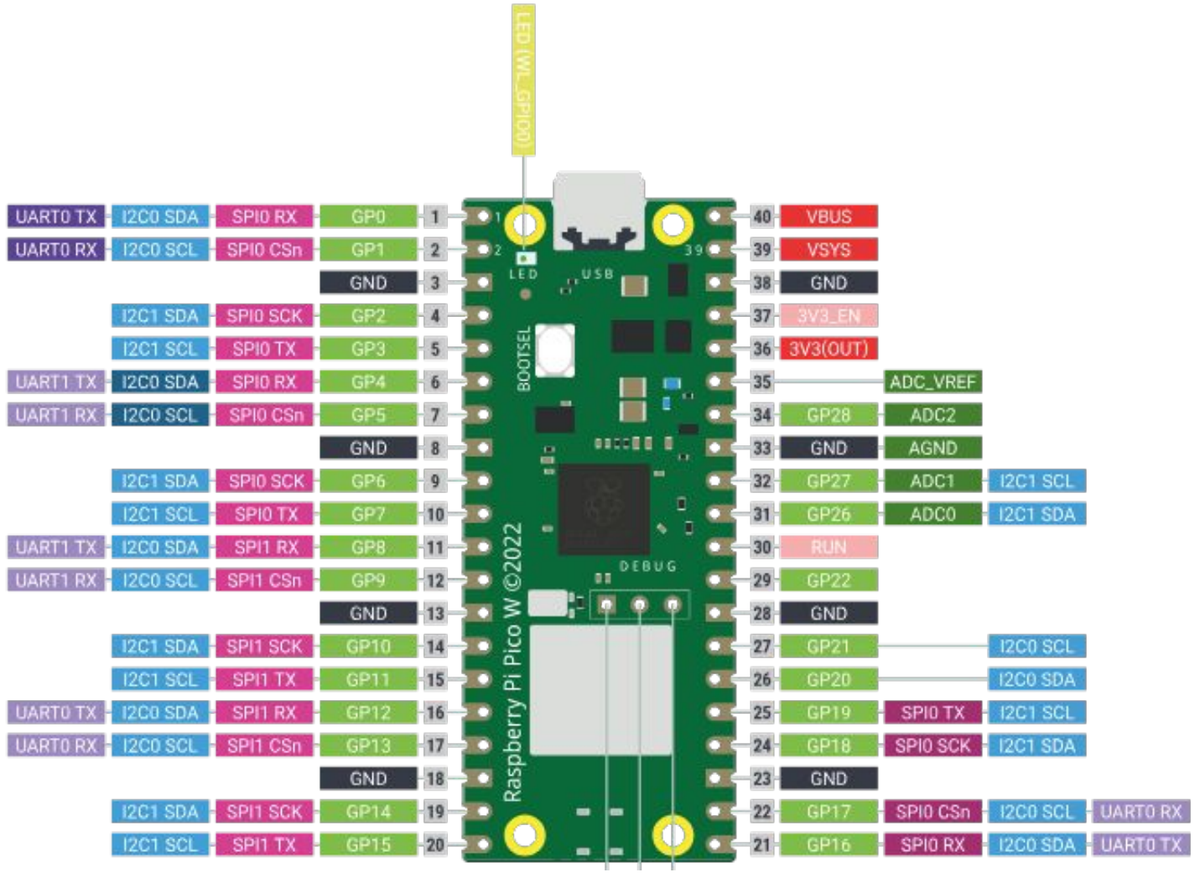
2x SPI

29x GPIO

3x Analog In

WiFi

Bluetooth



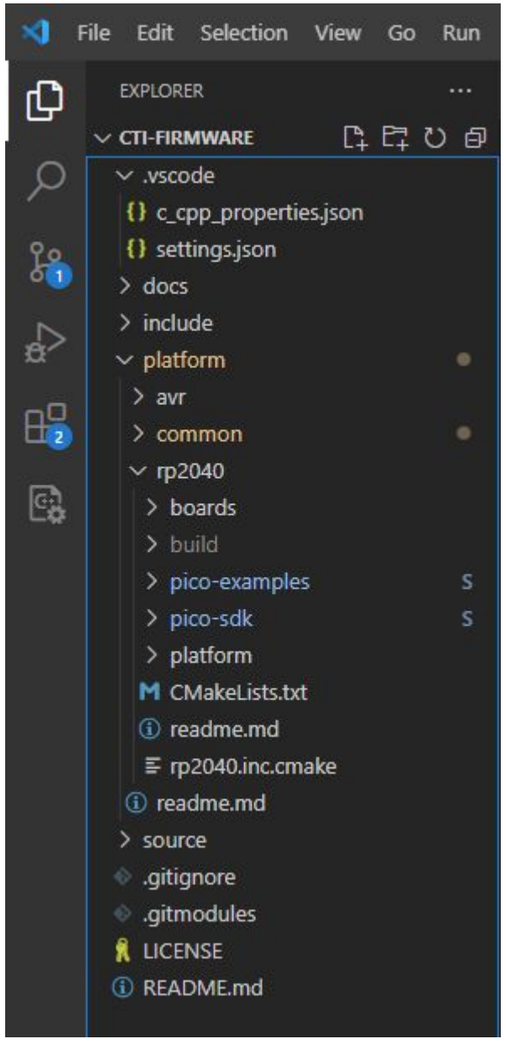
Dual core Cortex-M0+

Up to 133MHz

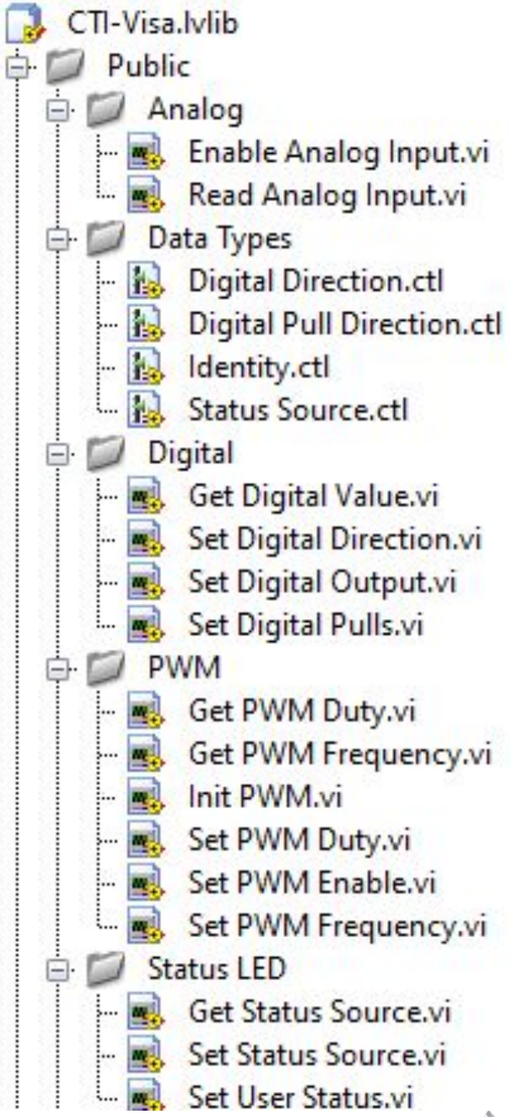
264kB SRAM

2MB Flash Memory

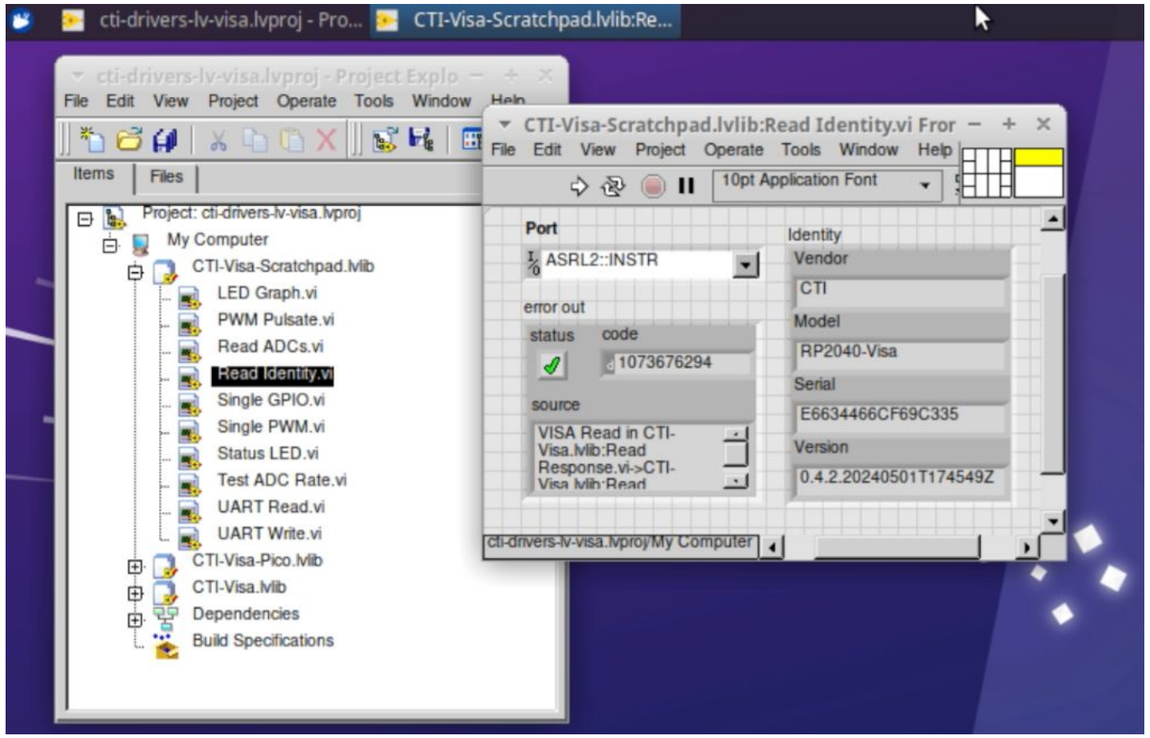
From the Ground Up



- Pi Pico Firmware
- LabVIEW VISA Drivers
- Training Hardware Drivers
- HW Emulator



The Future



- WiFi connectivity for Pico, work “untethered”!
- Additional targets - Arduino, ESP32
- DAQmx style API
- More emulator capabilities
- Dedicated Getting Started Window and project integration*
- Device and firmware manager software
- Engage the community for more lessons, firmware, and ideas development

DEMO and Q&A Time!