21M.370 Digital Instrument Design
Kit Overview

To help you get started with your kit, I've assembled a bunch of videos and documentation to refer to. There are almost 3 hours of tutorials videos below - which should cover everything you will need to know to get your kit assembled and ready to use. Feel free to speed through the videos, and use the description on the youtube page to gauge what the content of the video is for future reference.

First Steps

First off, an overview of the contents of your kit:

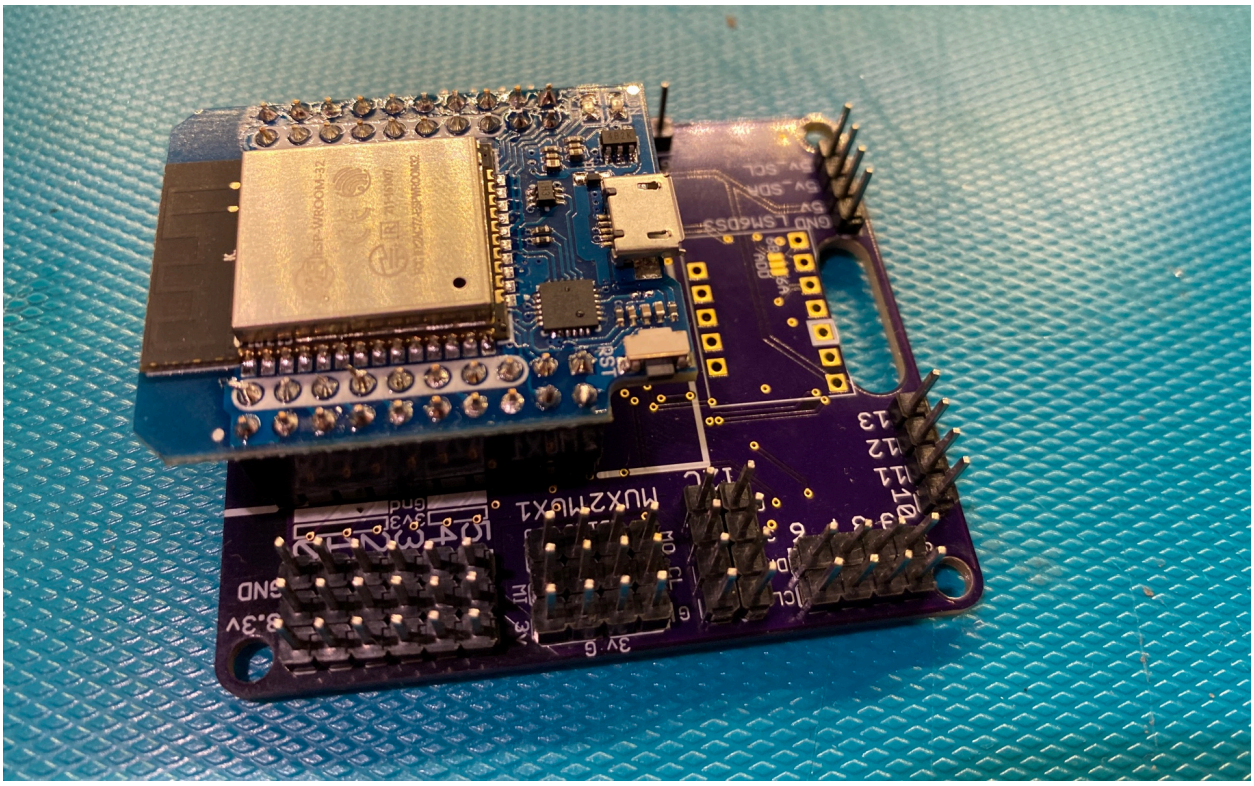
1. Video walkthrough
2. Pictorial documentation of kit elements, available on <github/NIME/class/kit overview>

Secondly, a soldering tutorial for assembling the ESP32 and our main breakout PCB:

1. Short video introduction to soldering - some good practical info here: https://youtu.be/QKbJxytERvg
2. Long video showing how to assemble the ESP32 and breakout, featuring:
    1. basic soldering advice
    2. swapping out soldering iron tips
    3. discussion of the soldering iron and accessories in the kit
    4. discussion of the breakout board layout
    5. lots of video of me soldering all the headers on
    6. using the multimeter to check for short circuits, verify your circuit board, and measure resistance.

7. Lots and lots of advice on assembling circuit boards

At the end of the soldering tutorial you should have something that looks like this:



Preparing for the first ESP32 lab

One the board is assembled you will want to prepare for the next lab:

1. Solder headers onto buttons and potentiometers
    1. assembling potentiometers
    2. assembling buttons
2. Connect buttons and potentiometers to breakout board
3. Upload a ‘hello world’ firmware to the ESP32 to test

In addition, here is a short tutorial on electronic signals which will cover the basic kinds of signals we will use in the class.

Working with Arduino

You can download the most recent version of Arduino here. Note you will note be able to use the web-based version with the ESP32 :-(

Before being able to compile for the ESP32, you will need to do the following (this is also covered in the Hello World tutorial video):
- paste the following link into Arduino->preferences->Additional board managers URLS:
https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json
- then go to tools->boards->board manager
- enter esp32 in the search box
- select the esp32 definitions by espressif and install
- then you should see the options below

You should always use the following settings:
- Tools->Board: TTGO T1
- Tools->Port: select the serial port for your ESP32
- Tools->upload speed: set to 460800 or lower
- Serial monitor set to 115200 kbps