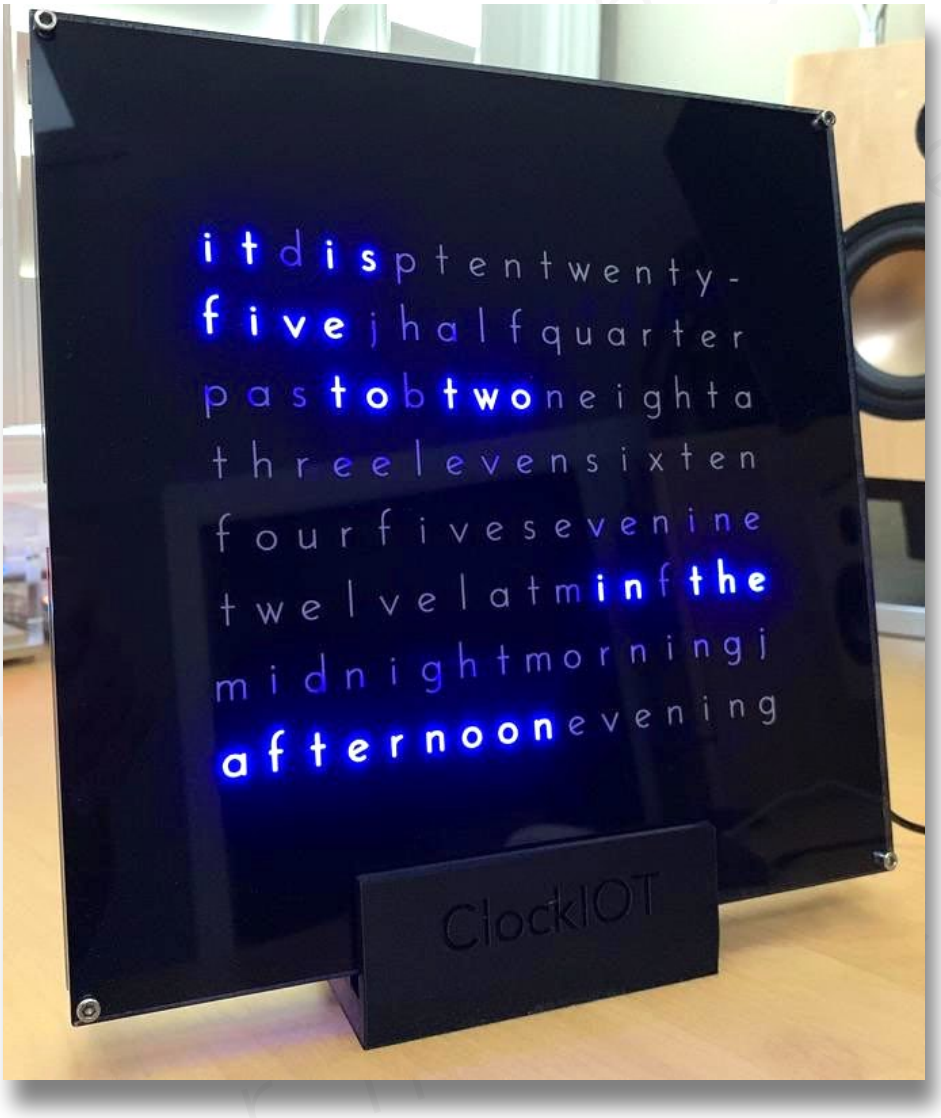
ClockIOT[1]



The Multicolored Internet-Connected Word Clock

[1] *Internet Of Things….*

open source open source hardware

Introduction

What is ClockIOT? ClockIOT is the follow up to the ClockTHREE Jr word clock.[2] It's an internet connected timepiece that connects to your home/work WiFi and fetches the correct time from, well, the Internet!! It has a number of new features over its predecessor, the most visible of which are RGB LED's, allowing a multitude of colors and effects to be displayed. The clock includes a variety of different style 'faces', including 'Matrix', 'Word Drop', 'Cloud', 'Fire' and 'Glitch', each with its own animation and all selectable using the buttons on the back the clock or on a web browser (phone or laptop) on the same network as the clock. You can even dim or brighten the LEDs though the same interface! The clock is available in a variety of languages, currently including English, Dutch, French, German, Hebrew, Hungarian, Italian and Albanian. The design and software is Open Source, therefore if you're so inclined, you can write your own display color animation or add a custom language![3]

What's In the Box

If you're the lucky recipient of a ClockIOT you'll find several things in the box, the clock itself a USB cable and a small USB power supply.[4]

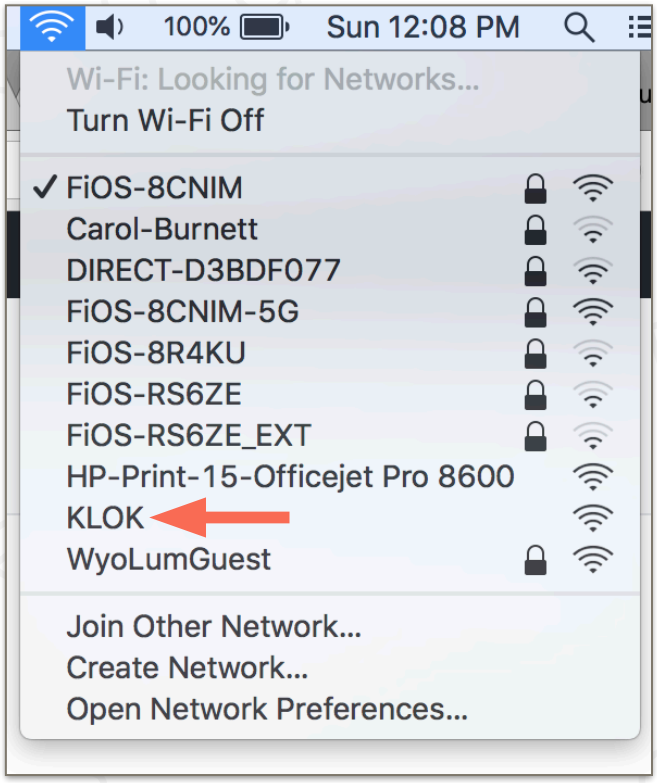
Powering Up For The First Time

By default, ClockIOT expects to be in range of a WiFi network. When the ClockIOT is turned on for the first time, it will create a temporary WiFi hotspot called "KLOK" and display "KLOK" using the letters on the faceplate as pixels (see right).

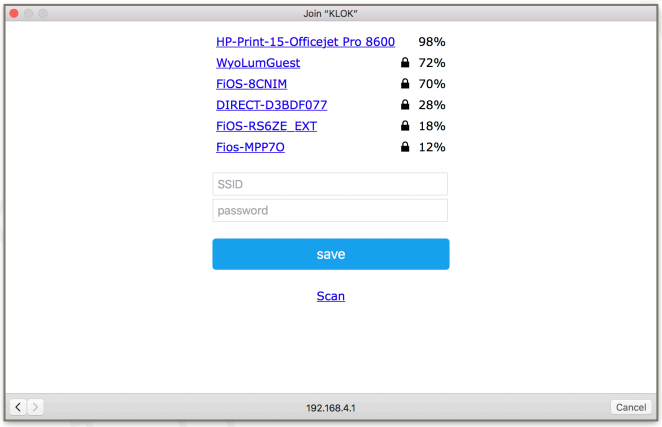
ClockIOT broadcasting a WiFi Hotspot and waiting to be connected

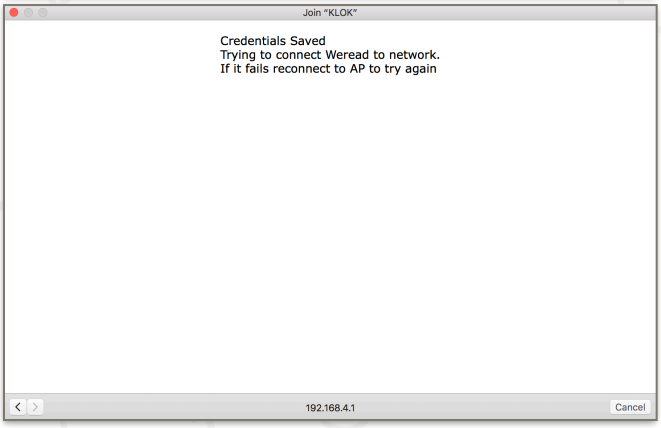
[2] https://wyolum.com/category/clockthree/page/2/
[3] Custom languages aren't too difficult….you will need a new faceplate though and we can help with the process.
[4] There is also an optional 3D printed stand for desktop use available.

Using either a computer or a smartphone, find the “KLOK” network in your WiFi settings. There will be no need to enter a password at this point.



You should see a friendly welcome screen[5]..click on ‘Configure Wifi’ and find your WiFi network. Enter the correct SSID[6] and password and hit ‘Save’.



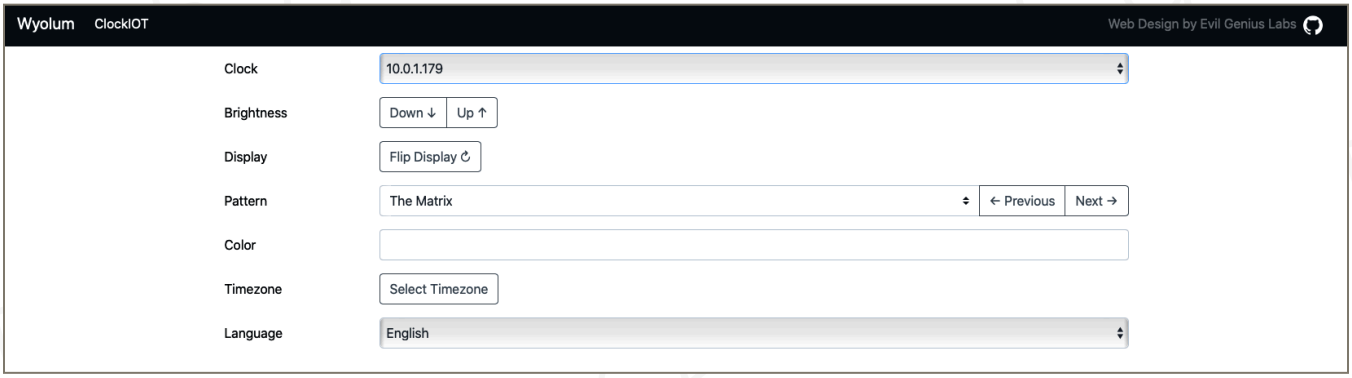


If all proceeds smoothly, you’ll be greeted with the screen to the left and the clock will now join your network and fetch the correct time from the Internet.

[5] Depending on the type of smartphone and your network this can take a few moments…
[6] SSID = Service Set Identifier - basically the name of your WiFi network!

Once connected to the internet, ClockIOT will look up UTC[7] (Zulu) time using NTP[8] and your timezone from wyolum.com.

Type http://www.wyolum.com/clockiot/UI/ in a browser on any device connected to your WiFi network to control any ClockIOT on that network.

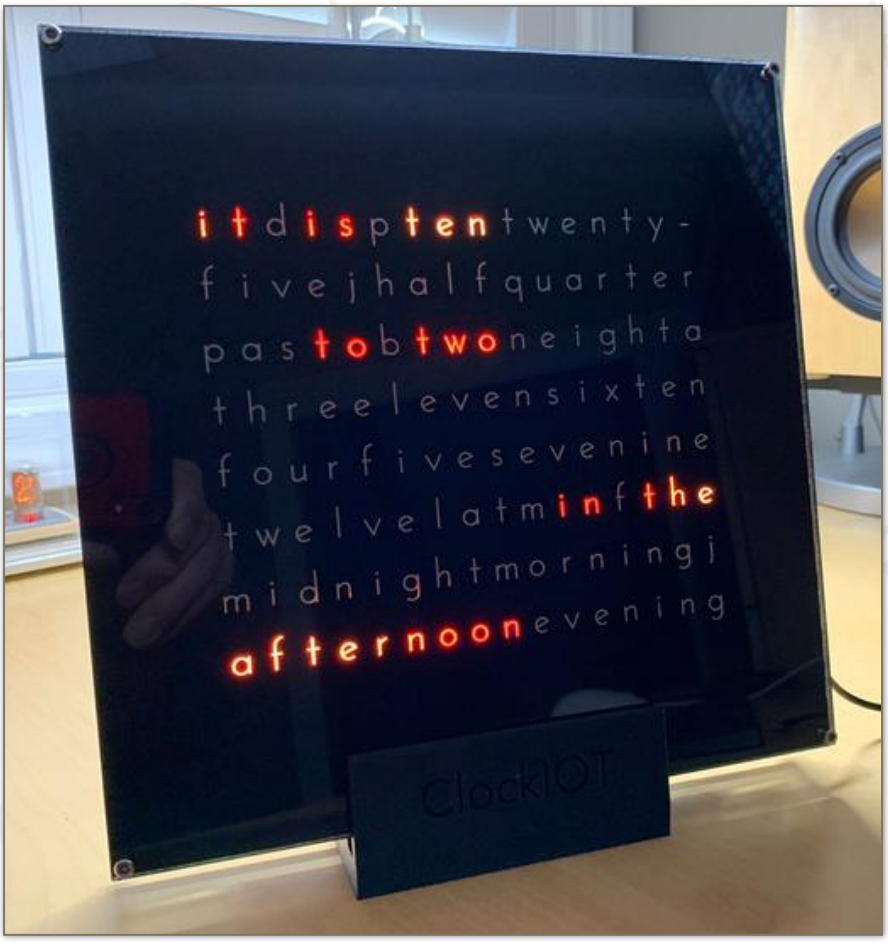


There are two sources of time on ClockIOT:

- NTP - Network time protocol
- DS3231 Real time clock

ClockIOT comes with a DS3231 real time clock which can maintain time to about one minute per year accuracy if no Internet is available. If internet is available, the current time and timezone will be determined using NTP and timezone lookup from your IP address. You can always override the timezone the internet provides, but then you will have to keep track of daylight savings time yourself.

Enjoy!



[7] https://en.wikipedia.org/wiki/Coordinated_Universal_Time
[8] https://en.wikipedia.org/wiki/Network_Time_Protocol

Anatomy of ClockIOT

Here's a view of the back of the clock (yours may look slightly different), but the button layout will be the same. The buttons have various functions depending on what 'state' the clock is in.

<u>Upon Boot</u>

- If no buttons are pressed the clock will go into normal mode.
- Hold MODE, Toggle use_wifi.
- If use_wifi is false: Go to Set Time Mode (see below).
- Hold MODE+ENTER to do factory reset.
- EN to reboot.

<u>RunTime</u>

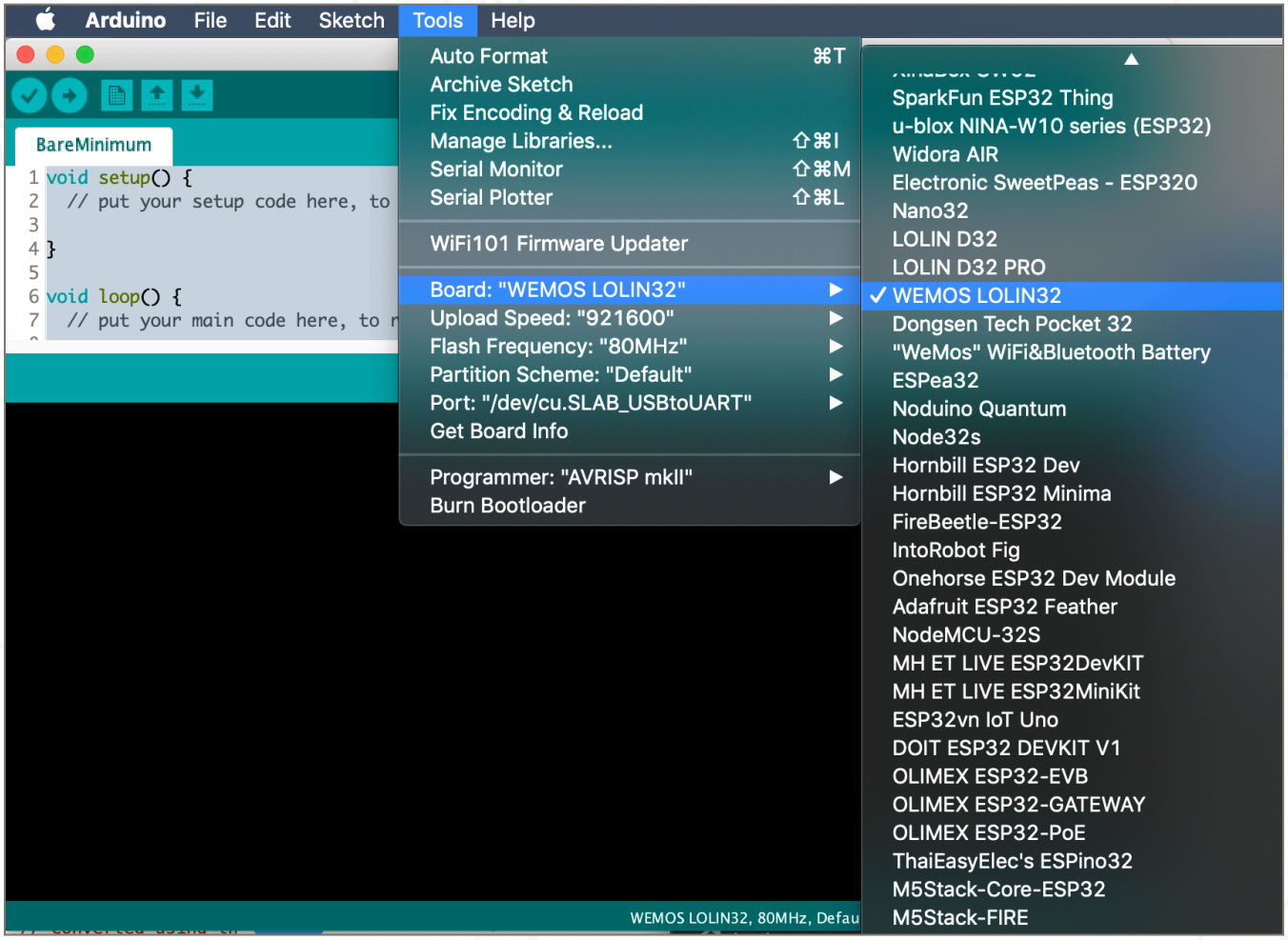
- MODE → change animation
- INC → brightens display
- DEC → dims display

<u>Set Time Mode (pulsing blue letters with green minutes)</u>

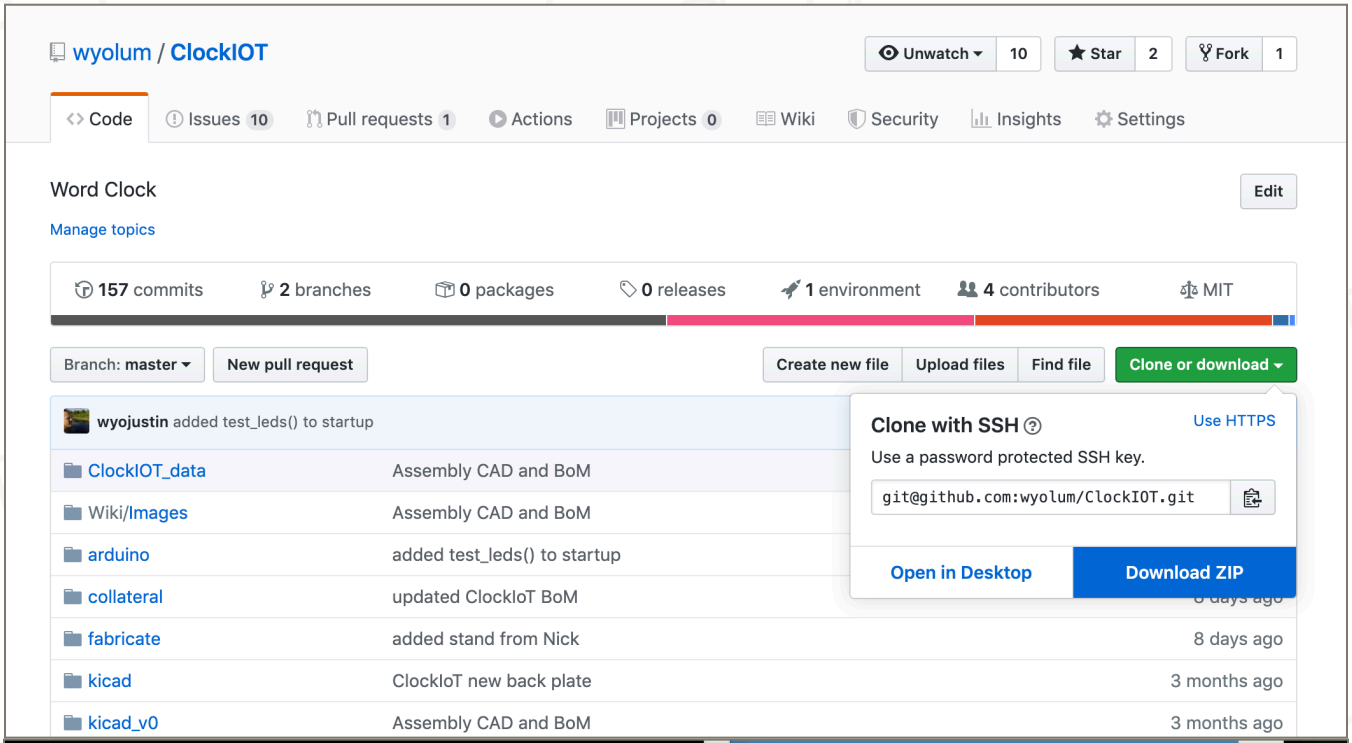
- INC → +60 seconds
- DEC → -60 seconds
- ENTER → +HOUR
- MODE → -HOUR
- EN → Reboot with new time

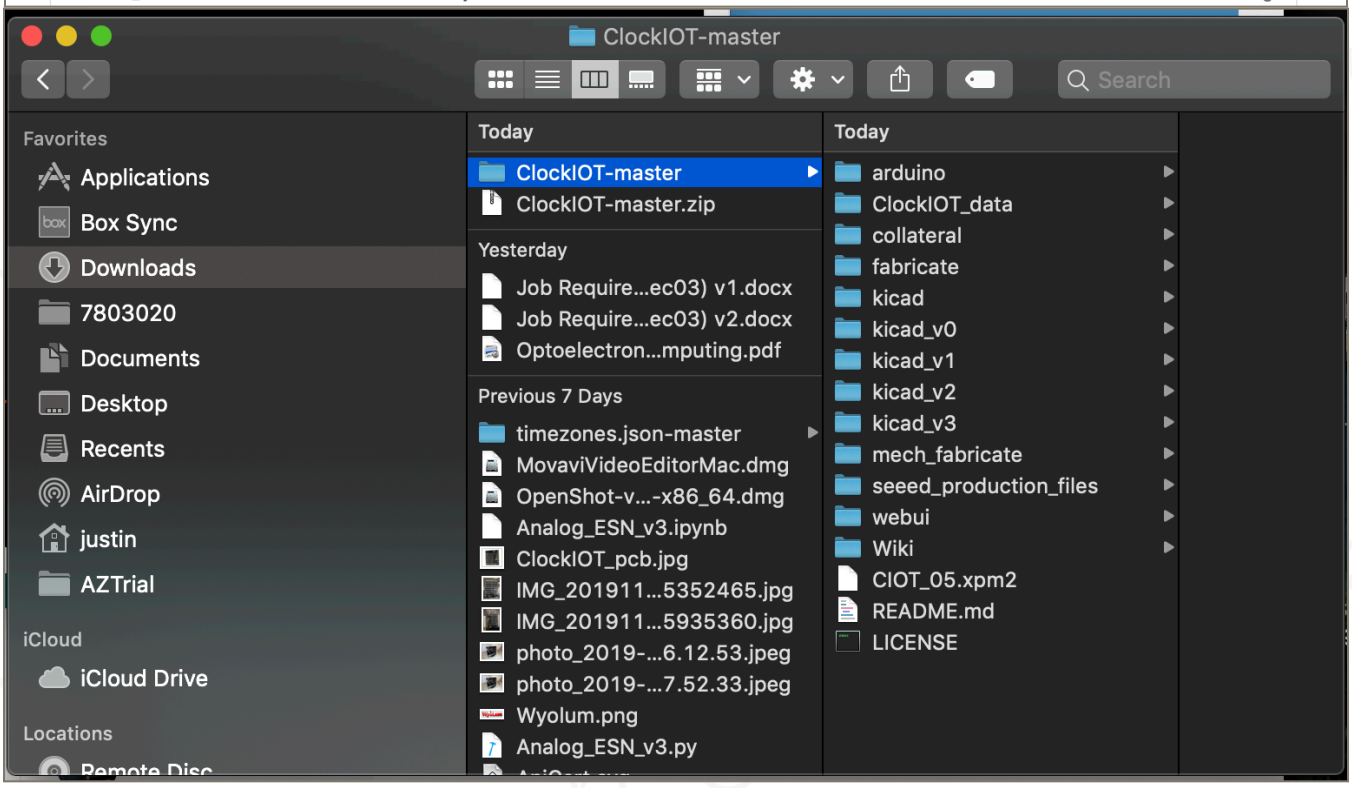
Installing/Updating Software

- Install Arduino for your operating system (tested on 1.8.7). https://www.arduino.cc/en/main/software
- Install ESP32 support. https://randomnerdtutorials.com/installing-the-esp32-board-in-arduino-ide-windows-instructions/
- Start Arduino and select the WEMOS LOLIN32 board from the "tools->Board" menu.

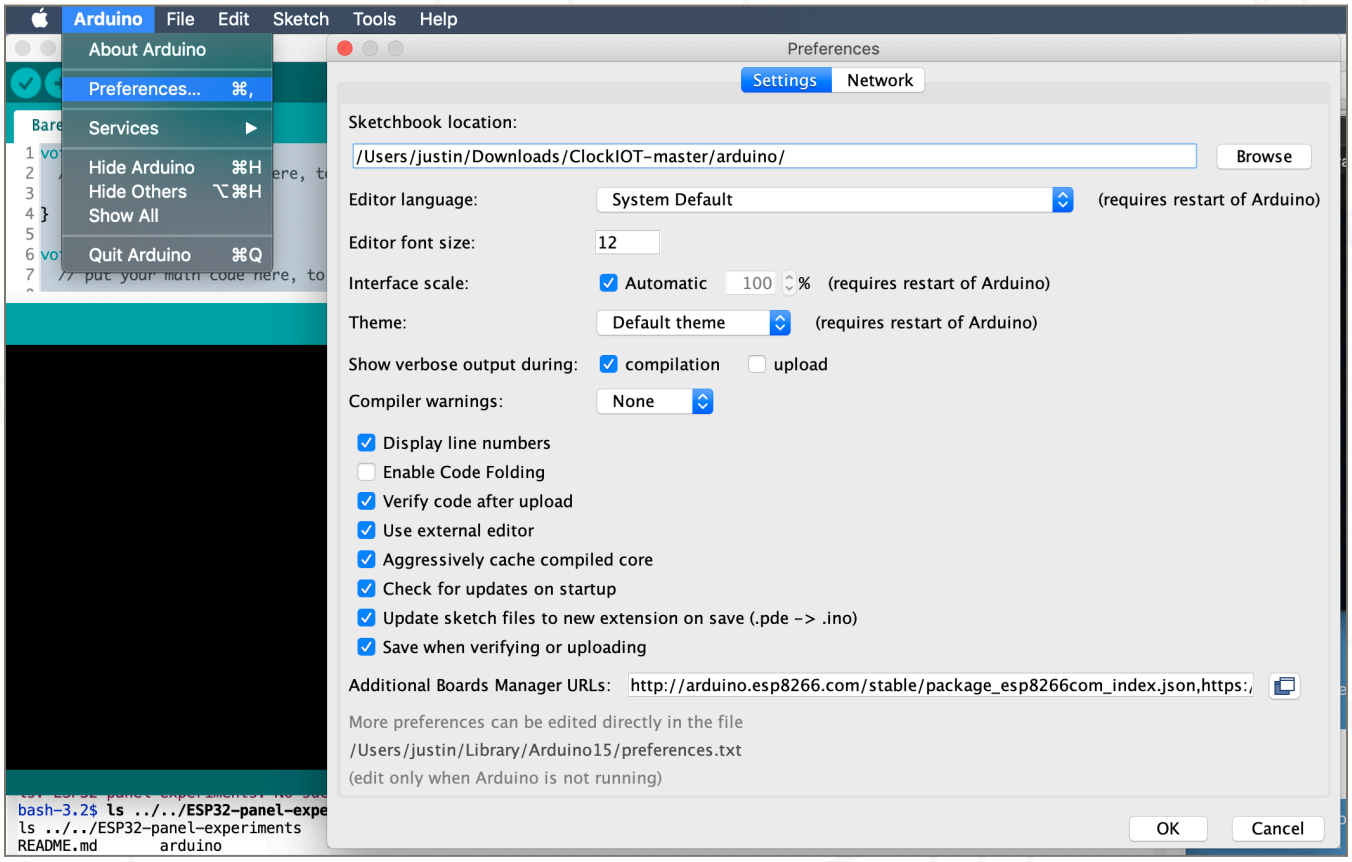


- Download and unzip the ClockIOT repository (ClockIOT_master.zip) from Github.

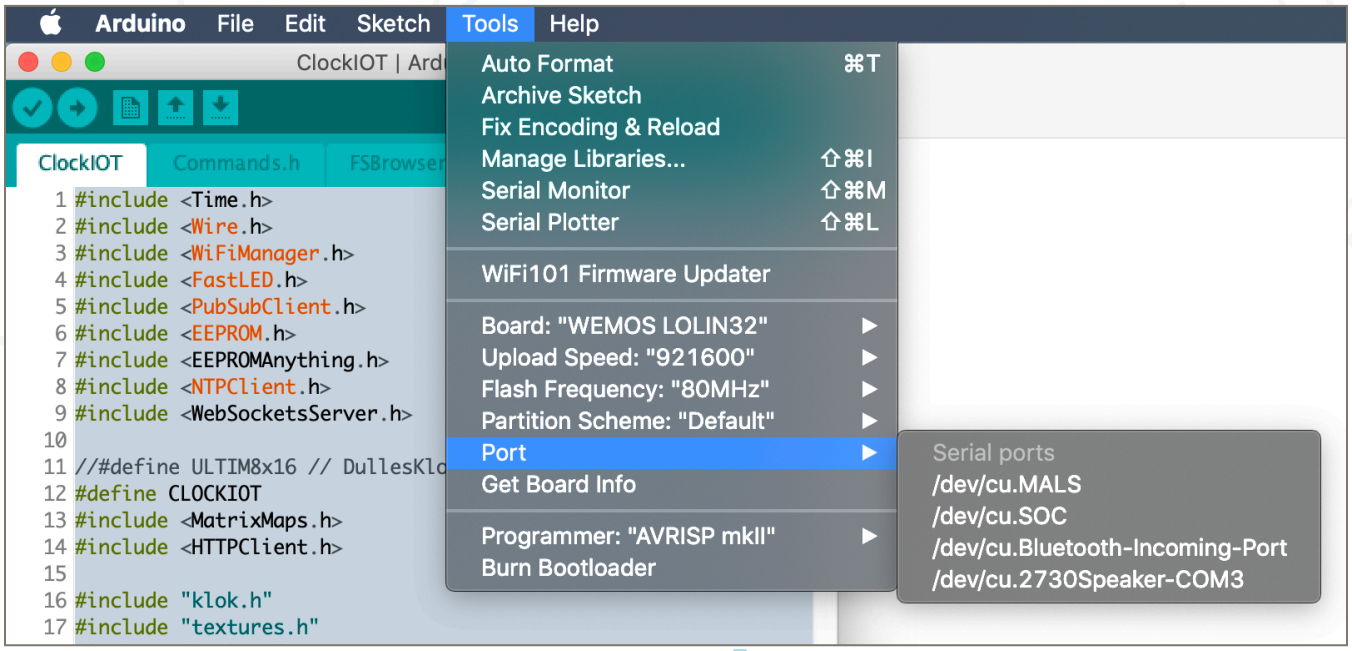


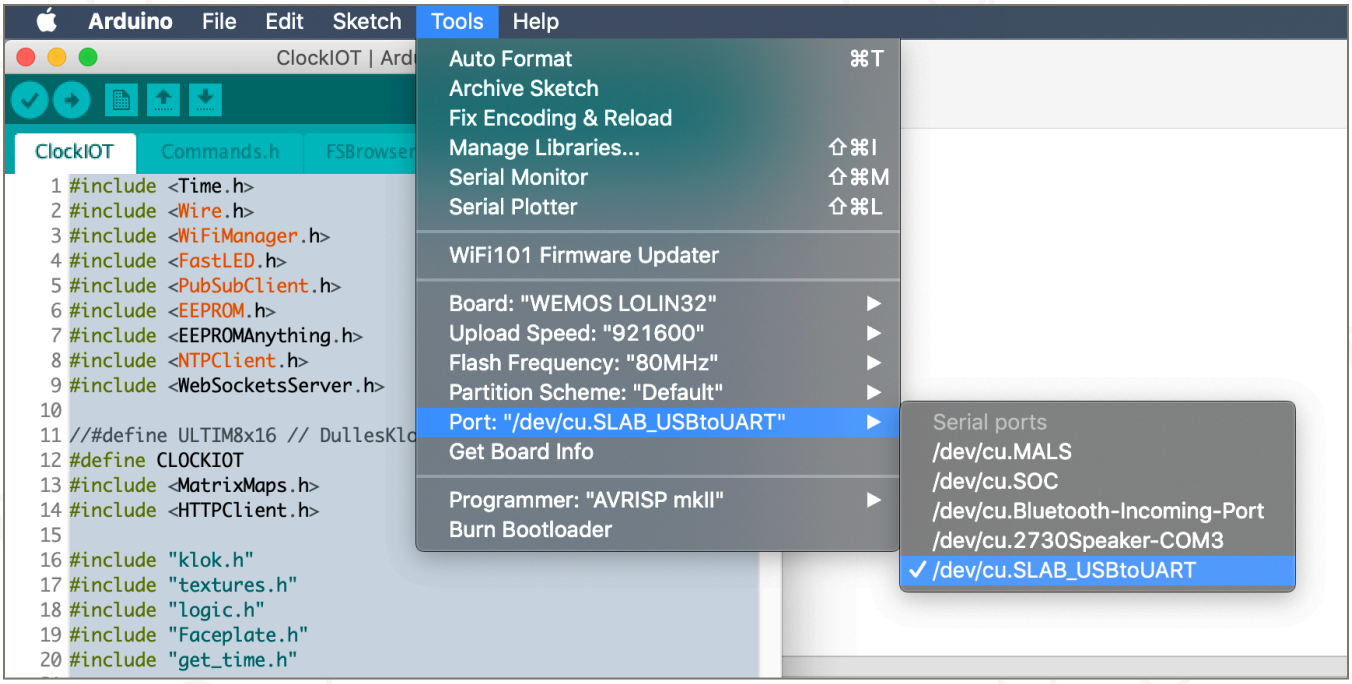


- Set Arduino library path to "<path_to_ClockIOT_folder>/arduino". On my computer this is "/Users/Justin/tmp/ClockIOT_master/arduino" as seen below. Replace "/Users/Justin/code" to the location of the top level ClockIOT_master directory.

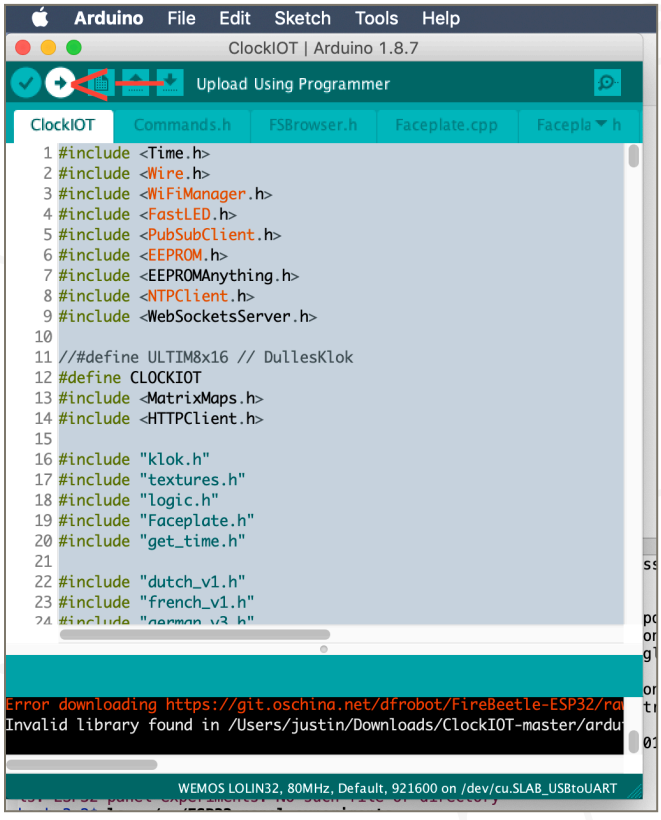


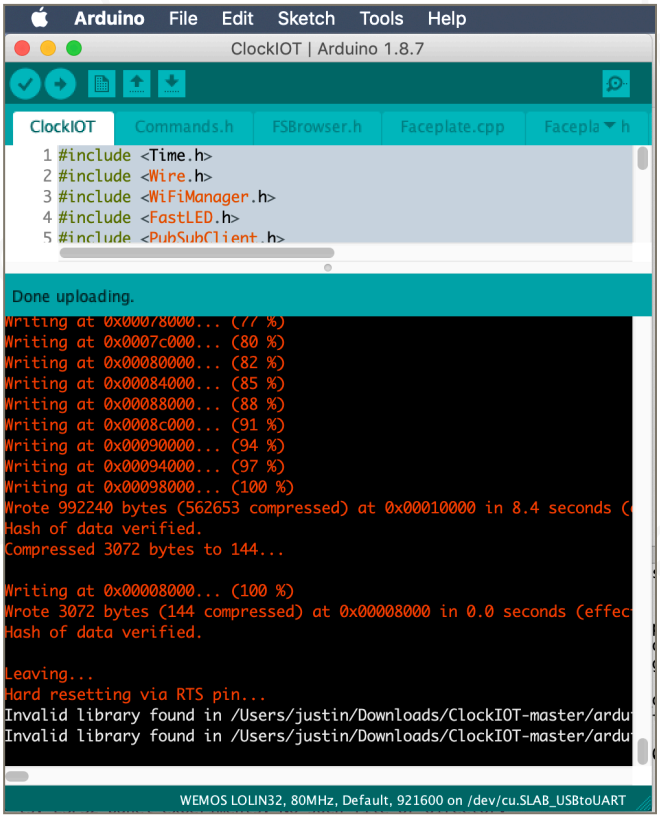
- Restart Arduino, open File>Sketchbook>ClockIOT then open Tools>Port, plug the ClockIOT in to a USB port then select the new port that appears in the list.





- Click upload and cross fingers!





- If you have any issues, post a Github issue with your operating system and version, Arduino version, and the complete error message. We will try and help you!

- Now go to QuickStart to complete the setup

Troubleshooting

If for some reason the ClockIOT isn't behaving as expected, then there are several things you can try to return to normal operation.

- Press the EN button to restart the clock.
- Turn off the power to the clock by removing the USB power, waiting for 5 seconds and then reapplying power.
- Applying a 'Factory Reset' - Hold down both the MODE and ENTER buttons whilst applying power and the clock face should return to saying 'KLOK' and be ready for the initial WiFi assignment process (AP mode).

If none of these solve your problems then please contact us for assistance.

If all the LED's turn RED then this can mean that the power supply is bad. Please try an alternate 5V USB 1A (minimum) supply. If this doesn't rectify the problem then please contact us for help.

If your clock displays the UTC time (right minutes, wrong hours), it failed to fetch the timezone from WyoLum.com. We have had a user in Australia experience this problem. We have a solution to this but it requires a firmware update. If this happens to you, we are sorry, let us know and we will walk you through the process to fix it.