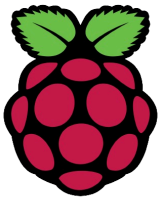
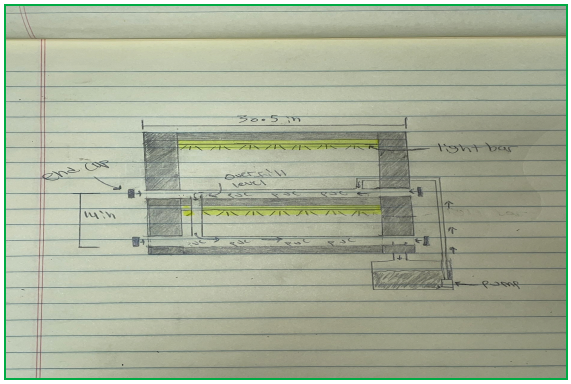
Pi - Ponics Step by Step



Supplies -

- Physical Structure
    - Two, 3 inch pvc pipe or drain pipe cut to desired length
    - Four, 3 inch pvc pipe end caps
    - Piping for drainage (I used)
    - Pipe fittings (I used)
    - Silicon glue
    - Hot glue gun with glue
    - 2 full spectrum light bars
    - 1.5 gallon tank
    - 2 inch hole saw bit
- Electrical Components
    - Raspberry Pi Pico
    - 5v relay
    - 5v water pump
    - Jumper wires
    - Lcd display (optional)
    - Pump tubing
- Growing Supplies
    - Desired plant seedlings
    - Hydroponic nutrient
    - 2 inch Net cups
    - Rockwool cubes

Part 1 - Building the Structure



Step 1 -

The first step when making your own Pi-Ponics system is to decide how you actually want to build your system. I sanded down, and stained an old pallet to be used within my system but it is up to you.

Step 2 -

Measure and trim the PVC pipe to your desired length. Mine was 30 inches across for each piece.

Step 3 -

Drill holes with the 2 inch hole saw bit, making sure they are at least 5 inches apart.

Step 4 -

Place pipes in the desired location and mark where the line from the top pipe will go to the bottom pipe. (these marks should be right on top of each other). Also place grow lights in desired locations for optimal coverage.

Step 5 -

Drill holes for the drain lines from the upper pipe to lower pipe using the marks made in the previous step.

Step 6 -

On the lower pipe, mark and drill a hole for the line that will be returning the nutrients to the reservoir.

Step 7 -

Cut drain piping to desired length and place fittings in the holes made in steps 5 and 6.

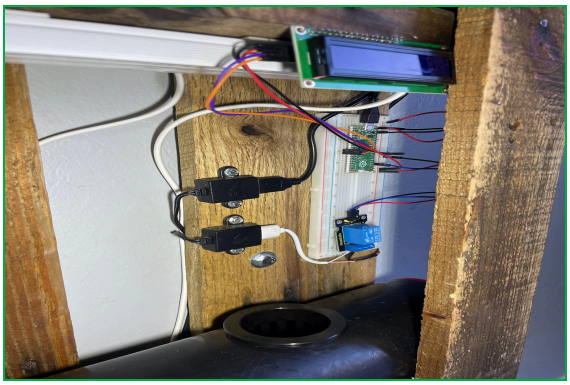
Step 8 -

Connect drain piping between the upper pipe and the lower pipe and connect drain piping from lower pipe to reservoir. And connect the pump to the top pipe.

Part 2 - Setting up the Pi

Step 1 -

Flash the Raspberry Pi Pico with Micropython and clone the repository to get started.

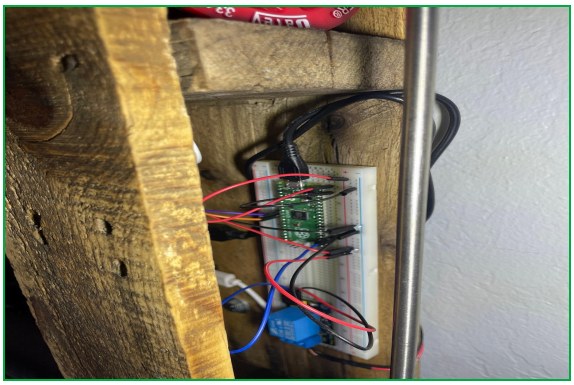


Step 2 -

Using a breadboard, connect the 5v VBUS on the Pico to the + rail on the breadboard, and connect the GND of the Pico to the - rail on the breadboard.

Step 3 -

Connect the V (voltage) connector on the relay to the + rail on the breadboard, connect the G (ground) on the relay to the - rail, and lastly connect the S (signal) to GPIO 18 on the Pico.

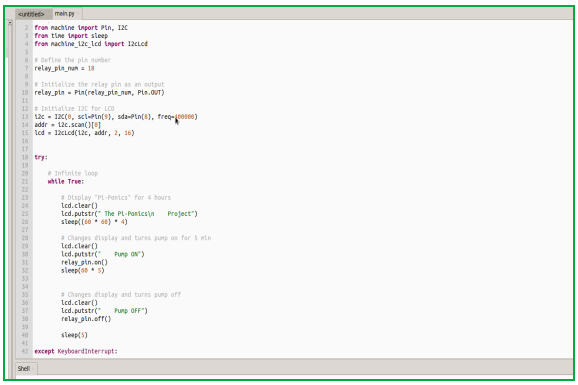


Step 4 -

Connect the positive wire on the power supply (i'm using a separate usb connection for the pi itself and the pump) to the positive on the Pump. Connect the negative of the power supply to the Normally Open (NO) terminal and connect the negative of the pump to the Common (COMS) terminal.

Step 6 -

With the Pico running Micropython, transfer the main.py file and the I2C file to the Pico's files t. (I recommend running the relay without power plugged into the pump so that you can open and close the relay without activating the pump)



Part 3 - Time to grow

Step 1 -

Clean the dirt off your seedlings and wrap them in a rockwool cube.

Step 2 -

Place seedling/rockwool cubes into net cups and into the system.

Step 3 -

Follow instructions for the nutrient and add the nutrient mix to the reservoir

Step 4 -

Plug in the Pico and let the system run its course. You can adjust the timing of the pump to shorten the time between cycles and lengthen the time the pump is on. Make sure the Reservoir is never empty as that could lead to damage to the pump.

- If you have any questions please reach out -

Happy Growing!