**User Guide Plant Patrol**



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# Introduction

Plant Patrol is a useful tool to monitor your plants’ watering needs. With the use of a simple button and sensor, paired with the code, you can display all the information you will ever need about the watering needs of your plants. The results from the monitoring will be displayed on a local website. How to set all this up will be explained below!

# Components

Plant Patrol functions with the use of 4 components.

* The Groove Moisture Sensor (<https://www.seeedstudio.com/Grove-Moisture-Sensor.html>)
* The Wemos d1 Mini (<https://www.tinytronics.nl/shop/nl/arduino/wemos/wemos-d1-mini-v2-esp8266-12f-ch340>)
* A standard red button
* A simple small breadboard

These 4 components are powered by the computer via a USB or USB-C cable. The breadboard is not essential but gives some sturdiness to all the cables, the sensor etc.

# Sensor data

The sensor data is displayed in a value from 0 - 950. The values are categorized in 3 sections, dry soil 0 - 300, humid soil 300 - 700 and when you put the sensor in water it will be 700 - 950. On the Plant Patrol website this data will be clearly displayed and put in a graph.

# Calibration

Calibrating is done with the red button. By calibrating you can set the current moisture level of your plant as 0. This means if the actual moisture level is 500, and you set it at 0, the original sensor range of 0 to 950, changes to -500 to 450. With this feature in mind, you should calibrate your plant BEFORE giving it water. By doing so, you not only have an easier time seeing how much water to give, you can also see when your plant needs water again. If the value would be -100, that means the moisture level is lower than last time you gave your plant water.

# Happy plant range

There is a range in which the plant will be happy. This range is -35 to 350. This is only useful after calibration, without calibrating it is not possible to go below 0. These ranges tell you if your plant has too little or too much water. Below -35 indicates your plant really needs some water. Above 350 means he has more than enough water. These values can help you decide how much water to give your plant and when to water your plant again. You can see the status of your plant by looking at the happy/sad plant picture below the graph. His expression will change based on the moisture value and the happy plant range.

Note: if you want the happy plant range to be different, ask an admin. In the admin guide is explained how to change the happy plant range.

# Graph

The graph is a useful tool to help with calibration. Because when you first put the sensor in the soil, the values will fluctuate a bit, trying to find the right moisture value. Because this can sometimes take a bit of time, you can use the graph to see a rise or drop in values. If you see that the values have stayed mostly the same for a few seconds, that means the sensor has found the right value. If the graph is filled with moisture values, you can always press the ‘Clear graph’ button to delete all the values.

# Check the weather forecast

To make Plant Patrol as versatile as possible, I included a way to also let Plant Patrol help decide whether you should water your outside plants. This is done with the help of the textbox and table at the bottom of the website. In this textbox you can enter a city, with the use of the openweathermap API, the website will display the weather forecast for that specific city. The forecast will be displayed for 3 timestamps, these are in 3-hour intervals. So if you were to enter a city in the textbox at 1pm, it will show the forecasts for the next 3-hour intervals. In this case that would be 3pm, 6pm and 9pm. However if you were to enter a city at 7pm, it would show you the intervals 9pm, 12pm and 3am of the next day. That’s also the reason a date is displayed in the table and not just a time.

If the forecast displays rain (in the description column of the table), you don’t have to water your outside plants, the rain will take care of this!

# Flowchart

This flowchart is made from the point where the user’s process starts. This does not include the admin setup that has to be done beforehand.

