1. ***What is the problem and why do you need IoT?***

I need to irrigate autonomously and remotely my plant when I am not at home.

I will provide a tank full of water near the plant.

The sensor I will use are a level sensor for measuring how much water is still in the tank , and a soil moisture sensor, to measure if the plant need water or not.

The actuator is a small water pump and a valve , in case we need to control the flux of another liquid as for example liquid fertilizer.

This is the list of sensors and actuators used in this work :

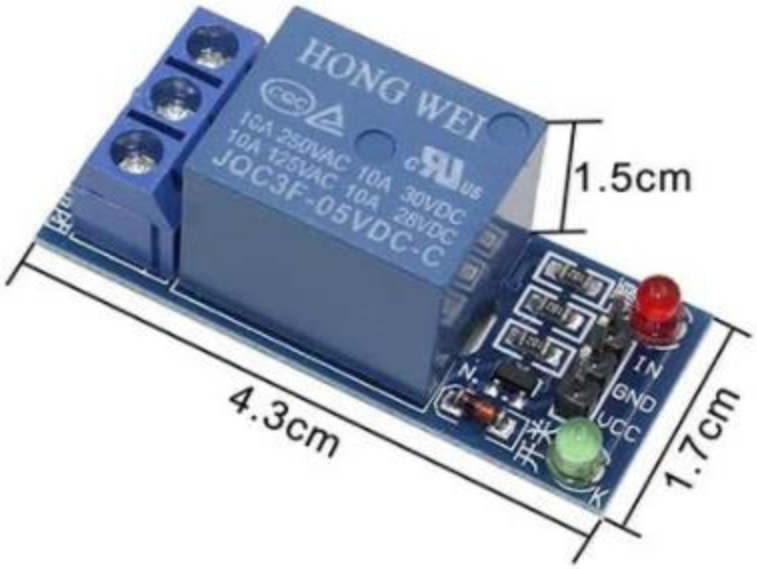
Modulo sensore livello acqua pioggia liquido water level sensor shield (arduino-compatibile): Amazon.it: Elettronica

iHaospace Capacitive Soil Moisture Sensor Corrosion Resistant for Arduino Moisture Detection: Amazon.it: Elettronica

Hanone Pompa Acqua Micro sommergibile e anfibia Pompa Acqua 3/4. Anfibio Anfibio Beige 5V: Amazon.it: Casa e cucina

ILS - Due bit tre vie Elettrovalvola valvola controllo elettronico Piccolo scarico valvola sfiato DC 5V DC6V: Amazon.it: Elettronica

https://www.amazon.it/sourcing-map-grilletto-Arduino-Lampone/dp/B07MMLZQJT



1 meter of tube

For the sake of simplicity and for demonstration purposes the periodicity of the sensor measurements is 3 seconds. The pump can be activated when the soil moisture measured value is behind a given threshold.

2. ***What data are collected and by which sensors?***

For the calibration of the soil moisture sensor please read this documents https://makersportal.com/blog/2020/5/26/capacitive-soil-moisture-calibration-with-arduino , https://www.electroniclinic.com/capacitive-soil-moisture-sensor-arduino-circuit-diagram-and-programming/ , , https://thecavepearlproject.org/2020/10/27/hacking-a-capacitive-soil-moisture-sensor-for-frequency-output/, https://media.digikey.com/pdf/Data%20Sheets/DFRobot%20PDFs/SEN0193_Web.pdf

I have not found a detailed datasheet with the accuracy of the sensors. The unit of measurement is $cm^3\ cm^{-3}$ as far as concern the soil moisture sensor.

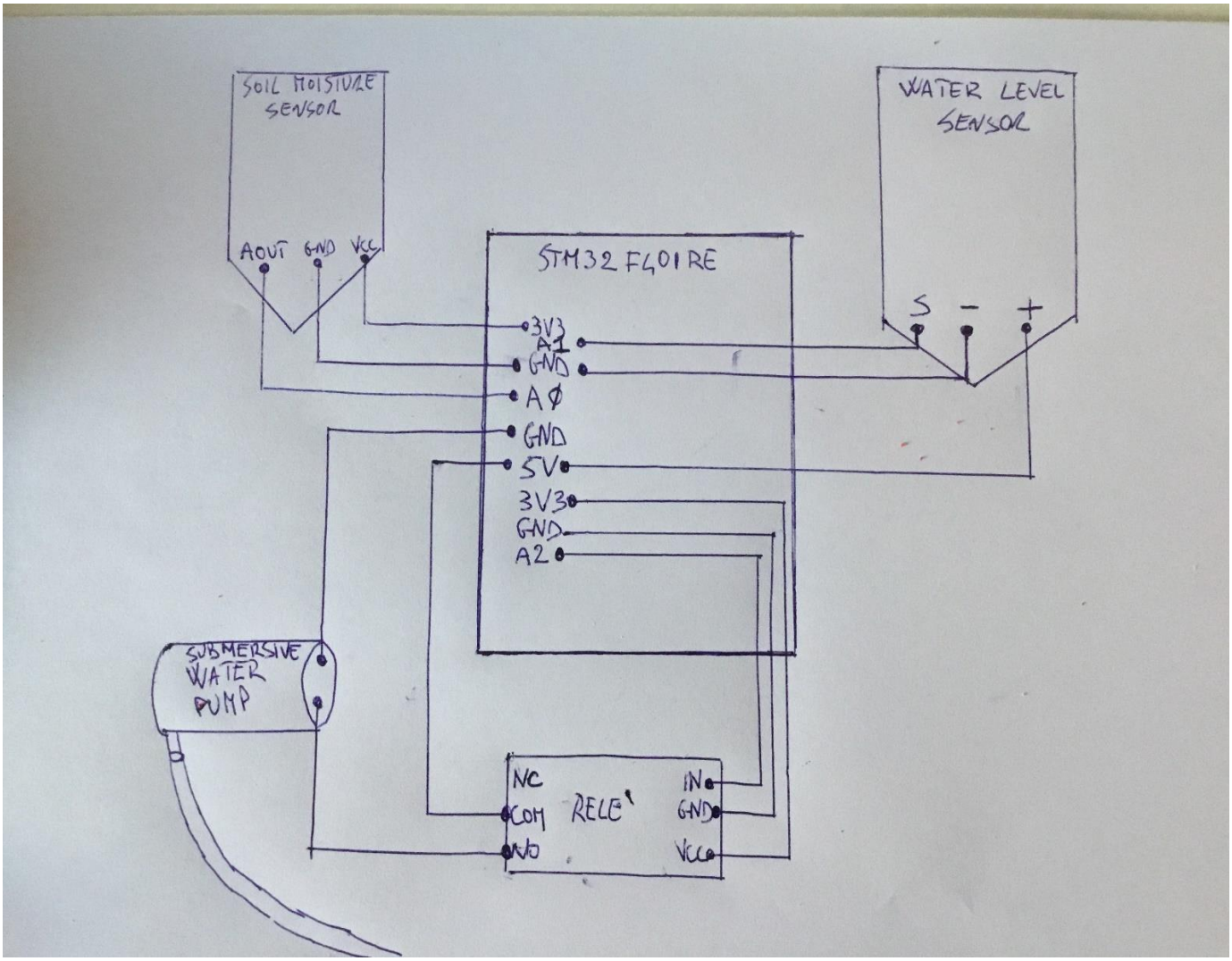
As far as concerns the water level sensor it is valid the following conversion table :

④ Immerse the sensor into the water deeply. The table below shows the relationship between the output voltage from the AOUT pin and the liquid level.

Liquid level	Output voltage
0cm	0v
0.5cm	1.3v
1cm	1.53v
1.5cm	1.62v
2cm	1.69v
2.5cm	1.74v
3cm	1.77v
3.5cm	1.81v
4cm	1.84v
4.5cm	1.86v
4.8cm	1.88v

I have not found a clear datasheet for this sensor, too.

3. ***What are the connected components, the protocols to connect them and the overall IoT architecture?***



- Provide a network diagram that includes all the devices and identifies the network and communication protocols used to interconnect them.
- Identify the software components that make up your system both at IoT device level and at cloud level.
- Provide a high-level architecture diagram that depicts the interdependencies of your software components.