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](https://www.amazon.it/sensore-livello-pioggia-liquido-arduino/dp/B01N9JZ09S/ref=sr_1_9?__mk_it_IT=%C3%85M%C3%85%C5%BD%C3%95%C3%91&dchild=1&keywords=liquid+level+sensor&qid=1617977831&sr=8-9)

A red toy car

Description automatically generated with low confidence

[iHaospace Capacitive Soil Moisture Sensor Corrosion Resistant for Arduino Moisture Detection: Amazon.it: Elettronica](https://www.amazon.it/iHaospace-Capacitive-Corrosion-Resistant-Detection/dp/B07DDFZ3MD/ref=sr_1_10?__mk_it_IT=%C3%85M%C3%85%C5%BD%C3%95%C3%91&dchild=1&keywords=soil+moisture&qid=1617977793&sr=8-10)

A picture containing text, black

Description automatically generated

[Hanone Pompa Acqua Micro sommergibile e anfibia Pompa Acqua 3/4. Anfibio Anfibio Beige 5V: Amazon.it: Casa e cucina](https://www.amazon.it/Hanone-sommergibile-anfibia-4-Anfibio-Anfibio/dp/B08YYM27GG/ref=sr_1_6?__mk_it_IT=%C3%85M%C3%85%C5%BD%C3%95%C3%91&dchild=1&keywords=small+water+pump+5v&qid=1617977754&sr=8-6)

A white cord plugged into a charger

Description automatically generated with low confidence

[ILS - Due bit tre vie Elettrovalvola valvola controllo elettronico Piccolo scarico valvola sfiato DC 5V DC6V: Amazon.it: Elettronica](https://www.amazon.it/gp/product/B07H4LJGCY/ref=ppx_yo_dt_b_asin_title_o01_s00?ie=UTF8&psc=1)

A close-up of a watch

Description automatically generated with low confidence

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

A picture containing text, electronics

Description automatically generated

1 meter of tube

Diagram

Description automatically generated with low confidence

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.

1. ***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 cm3 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 :

Table

Description automatically generated

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

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

Diagram, schematic

Description automatically generated

* + 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.