

Automatic Plant Watering System Using Arduino

ABHISHEK. V¹, AKASH.R², DR. P. N. SUDHA³

^{1,2} UG Student, Department of Electronics and Communication, K.S. Institute of Technology, Bengaluru, India

³HOD, Department of Electronics and Communication, K.S. Institute of Technology, Bengaluru, India

Abstract— The aim of this project is to ease the mechanism of watering plants at home with the help of this Automatic Plant Watering System which automatically switches the water pump ON or OFF depending on the moisture content of the soil, which is continuously sensed by the soil moisture sensor. The entire process is controlled by Arduino UNO which is programmed using Arduino IDE software.

Index Terms— Arduino UNO, Soil moisture sensor, Water pump, Moisture content of the soil.

I. INTRODUCTION

This proposed project on Automatic Plant Watering System is a beneficial automated system which helps in watering the plants at the right time with the right amount of water. The whole system can be classified into three main processes. First one is the process of sensing the moisture content of the soil. Second one, is the process of determining the status of the soil: dry or wet. Third one, is the process of water pump control: turn ON or OFF.

The soil moisture sensor continuously detects the moisture content of the soil and depending on the condition it sends the response to the Arduino UNO which in turn controls the water pump. So, this system helps in water consumption by watering the plant only when it is needed hence preventing excess watering or under watering.

II. LITERATURE SURVEY

“Microcontroller Based Automatic Plant Irrigation System” [1]. In this paper they have used a soil moisture sensor which is placed in the root zone of the plant/field. The temperature and soil moisture sensors send information regarding humidity of the soil and transmits the data to the AtMega328 microcontroller which sends this information including the status of the pump to the farmer through GSM Module. When

the moisture content reaches above the desired threshold value the pump is automatically switched off and the message is conveyed to the farmer. Their project aimed to automate the watering process to large surface areas like fields where as our project aims to automate the watering process within household limits by using similar principle. But in this project the components used are simpler, cost effective and easy to build the system.

“Microcontroller based Automatic Irrigation System with Moisture Sensors” [2]. This paper proposed a microcontroller based automatic irrigation system which is a combination of hardware and software that provides irrigation control. The system should be easy to rectify any fault in the event and it is user friendly as it requires only eight keys for operation.

“GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by Using an Android Mobile” [3]. In this paper they have used GSM based embedded system for irrigation. The status of the soil is continuously monitored by the sensors and the flow of water is controlled by sending a message from the mobile. It includes an incorporate Bluetooth for remote monitoring which in turn reduces range problem of GSM network and SMS cost is also saved. This system also has smoke sensors and sends information to user if the motor catches fire.

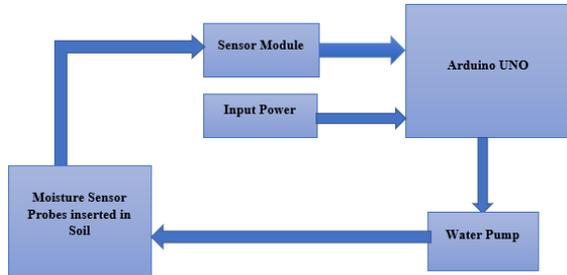
III. PROPOSED WORK

The objectives of the proposed work are:

- To sense the moisture content of the soil and automatically switch ON or OFF the water pump when power is given.
- To minimize wastage of water.
- To reduce human dependency for watering plants at home.

- The system is small in size and simple to build hence making it easily portable.

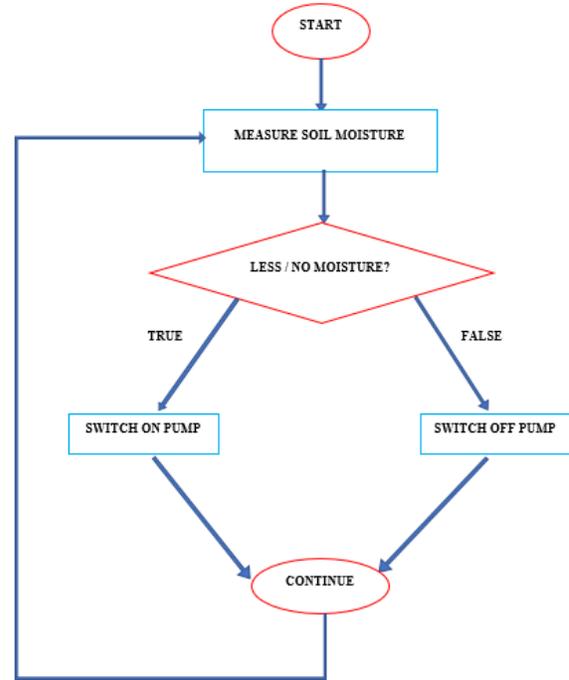
BLOCK DIAGRAM



WORKING

- Once the Arduino is supplied with the input power the moisture sensor is also switched ON, the system is designed to sense the moisture content of the soil continuously with the help of a soil moisture sensor.
- The probes of the moisture sensor acts as a potentiometer where the resistance between the probes vary with respect to the amount of moisture content present in the soil.
- The resistance varies inversely with the amount of moisture content present in the soil. More moisture content leads to improved conductivity between the probes hence leading to lower resistance. Less moisture content leads to poor conductivity between the probes hence leading to higher resistance. Based on this resistance the sensor module produces an output voltage which determines the moisture level, which can be read at Analog Output (AO) pin.
- The knob on the sensor module can be rotated clockwise to increase the sensitivity of the sensor and anticlockwise to decrease the sensitivity of the moisture sensor depending on the nature of the soil.
- Based on the output received by the moisture sensor through AO pin the Arduino which is programmed will turn ON the water pump if the moisture content is less and turn OFF the pump when sufficient amount of water has been pumped.

FLOW CHART



RESULT

On inserting the moisture sensor probes into the dry soil, the sensor successfully sensed the absence of moisture in the soil and hence the water pump was turned ON automatically hence watering the plant.

Once the soil was wet enough the water pump was automatically turned OFF as the moisture sensor had sensed the presence of moisture content in the soil.

Just the right amount of water will be released and the water will be directed to exactly where it is needed through water pipes i.e., to the bottom of the stem so that the roots get the maximum use of water hence minimizing the wastage of water.

OUTPUT

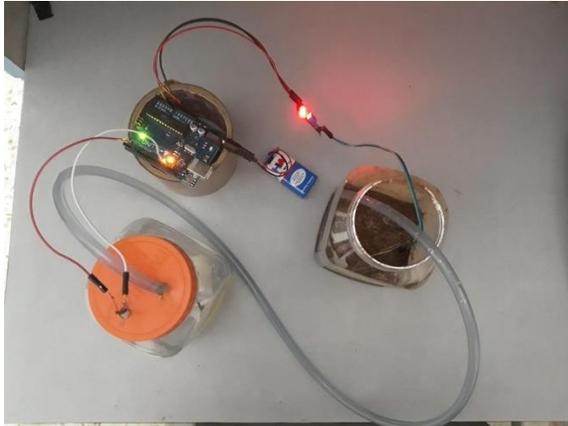


Fig 1. The working model of the proposed project.

Mechanical and Civil Engineering (IOSR-JMCE), Volume 11, Issue 4 Ver. I (Jul-Aug. 2014), PP 49-55

CONCLUSION

By designing and implementing this simple and easy Automatic Plant Watering System the maintenance of household plants becomes easy for those who travel quite often, very much busy in their work and tend to forget to water their plants. They have to just see to it that the container in which the water pump is placed contains enough water to pump. Further enhancement of this project can also be done in the medical field where certain medicinal plants require frequent watering of the right amount of water at the right time, which will be very difficult to be watered by human hands.

REFERENCES

- [1] Bishnu Deo Kumar, Prachi Srivatsa, Reetika Agarwal and Vanya Tiwari, "Microcontroller Based Automatic Plant Irrigation System" published in the International Research Journal of Engineering and Technology (IRJET). Volume:04 Issue:05 | May – 2017
- [2] Abhinav Rajpal, Sumit Jain, Nistha Khare and Anil Kumar Shukla, "Microcontroller based Automatic Irrigation System with Moisture Sensors", International Conference on Science and Engineering, 2011, pp. 94-96
- [3] Pavithra D. S, M.S. Srinath, "GSM based Automatic Irrigation Control System for Efficient Use of Resources and Crop Planning by Using an Android Mobile", IOSR Journal of