IOT Based Soil Irrigation App

Thejeshwar AB,

CSE Department, R.M. K Engineering College,

Email:hej17325.cs@rmkec.ac.in

Vignesh S,

CSE Department, R.M. K Engineering College,

Email vign17331.cs@rmkec.ac.in

Lalitha S.D,

Assistant Professor, CSE Department, R.M. K Engineering College,

Email sdl.cse@rmkec.ac.in

--**ABSTRACT**---

India, being a country, whose backbone is the agriculture, more and more innovations must be employed in this life saving field, in order to make our lives comfortable. In this paper, based on IoT, a soil irrigation app is built, to help the farmers by automatically switching the motor on or off, based on the humidity of the soil. This is primarily done using a DHT11 Irrigation sensor, which constantly determines the humidity of the soil which later, using a SIM800A Quad Band GSM module, sends signals to the Arduino, which is the Central Processing Unit of this system, utilized here. According to the signals from the sensor to the Arduino, remotely the motor is turned on or off, according to the needs and requirements.

Keywords - **DHT11 Humidity Sensor, SIM800A Quad Band GSM module/ GPRS Module with RS232 Interface, Arduino USO**

I. INTRODUCTION

The Internet of Things is the interface of physical devices nested with electronics, software, sensors, actuators and network connectivity that enables the devices to transfer the data. In other words, it can be specified as a simple way of connecting a physical device to internet. Everything is becoming smarter nowadays with the help of IoT. This includes everything starting from smart homes to cities, etc. Each and every thing is uniquely identifiable through its computing system but it is able to interoperate with the existing internet infrastructure. Experts estimate that IoT will consists almost 50 billion objects by 2020.

II. IMPORTANCE OF THE PROJECT

With the conventional idea of doing each and every operation manually, there is a chance for errors to occur. So in order to prevent all this, the automated irrigation system might help. This could save the water consumption, when the soil doesn't need, since it already has the right amount of humidity. Thus, over and under consumption of water can be rightly employed. And manual errors could be completely eliminated with the proposed idea.

1.1 Arduino USO

Variety of microprocessors and controllers are used in the design of Arduino. Digital and analog input/output pins are equipped in boards that may be interfaced to various expansion boards and other circuits. Serial communications interfaces is a feature in this board, including Universal Serial Bus (USB) on some models, which are used for loading programs from personal computers. These are programmed using C and C++.
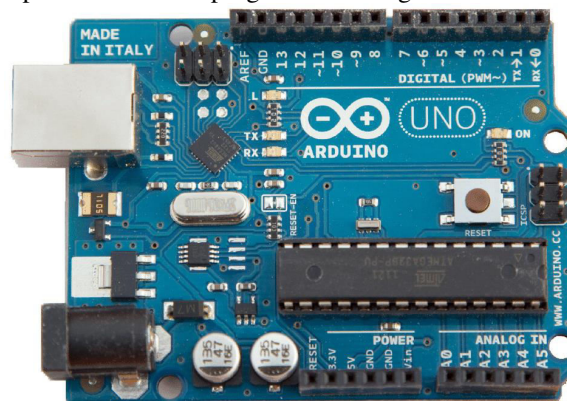

Fig 1: Arduino USO

1.2 Humidity Sensor

Basically a compact small device, which is mainly designed to calculate/determine the humidity of the soil, and also the air temperature. This actually detects the volumetric water content in the soil which is done using some properties of the soil, such as the electrical resistance, dielectric constant or interaction with neutrons as a proxy for the moisture content. This is done based on the voltage the soil produces since water acts as an electrolyte and produces electricity.

Fig 2:Humidity sensor with a digital meter

1.3 GSM MODULE

Either a SIM800A Quad Band GSM module or a GPRS Module with RS232 Interface is employed here between a mobile device and the sensor. Wireless communication between these 2 objects is made simpler by this module, which can be useful in many ways.

Fig 3:SIM800A GSM module

III. WORKING OF PROPOSED SYSTEM

At first, the humidity sensor, determines the moisture content in the soil, which is actually constantly monitored by it at regular intervals. With the help of a GSM module, this information is wirelessly transferred to the Arduino UNO board. This board being the control unit for this system, does the necessary calculations and predicts the duration of water supply which has to be provided to the soil, and here too, the sensor constantly checks the moisture and continuously sends the signals to the Arduino board. So, when the saturation point is reached, automatically, the motor is switched off remotely. With this, huge wastage of water which may happen in the conventional method of water irrigation, is drastically reduced and over supply of water is prevented.

IV. CONLUSION

So, based on Arduino USO microprocessor, a design concept of a soil's moisture monitoring system, is developed and with the help of this, irrigation to crops is

rightly given at the right time, to be accurate. The proposed system has a lot of advantages, where the predominant one might be to, save the water supply during unnecessary times for the crops, which may even lead to decaying of them, when the same process repeats over a period of time again and again. So this can be prevented without any complications here. The system which is described is highly reliable. A real time application can be built using Arduino for hardware and Java Script for the mobile application controlling the system.
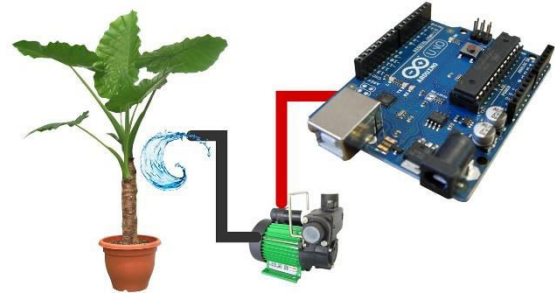

Fig 4:Real time application of the idea