International Journal of Trend in Innovative Research (IJTIIR)
Available Online @ www.ijtiir.com | ISSN: 2582-0354

Smart Home Gardening System Based on IOT

[1]P. Naveen, [2]V. Srinivas, [3]Y. Nagendra babu
[1]20K65A0238, [2]20K65A0250, [3]20K65A0254
[1,2,3]Sasi Institute of Technology & Engineering, Tadepalligudem

Abstract -- Now a day technology is playing a major role in the life of human being. So if we could able to use this technology to enhance the environment which results in good human health. This project of smart home gardening system includes the specialized features like automatic controlling and monitoring the moisture level of soil with soil moisture sensor, temperature sensor, pir sensor to alert the system, temperature value, security, soil level, crop growth. In this project we will overcome the issues like water wastage, security. In this project, we can display the values of sensors drawn the android mobile and to easy to control the moisture level of the particular garden. From this project to provides the good organic vegetables to human health and to reduce the wastage of power, water consumption and to monitoring the garden through android mobile app.

Keywords-- *LM35 Temperature Sensor, LM393 Soil Moisture Sensor, 12V, 25W Solar Panel, IOT.*

I. INTRODUCTION

The world we live in now is largely automated. It's a technique that uses computers and phones every day to regulate and identify simple characteristics. Sensors are utilized to deliver messages to one another using the IoT idea. The main benefit is that it saves money and provides more protection. People who have their very own garden system should use caution while maintaining. The plants will be ruined if they are not tended throughout the day. IoT has been already in use with novel multiple techniques. The monsoons are irregular and uneven availability of water throughout the year poses a major Problem. All this leads to inadequate yield and low productivity. The implementation of scientific methods in the field of agriculture can bring about radical changes in the productivity of crops, due to improved efficiency in the farming techniques of the various advantages that IoT brings to the table, its ability to innovate the current scenario of farming methods is absolutely ground-breaking. Mostly, we come across ideas that suggest a wireless sensor network that collects data from the various sensors present in the field and sends the data to the main central server (Mobile). This method focuses on studying the environmental factors to improve crop yield.

II. LITERATURE SURVEY

Types of Sensors:

1. Temperature Sensor
2. Soil Moisture Sensor
3. Passive Infrared Sensor

1. Temperature Sensor:

There are different types of temperature sensors like temperature sensor ICs (like LM35), thermistors, thermocouples, RTD (Resistive Temperature Devices), etc. Temperature sensors are used everywhere like computers, mobile phones, automobiles, air conditioning systems, industries etc.

In a temperature sensor, the changes in the temperature correspond to change in its physical property like resistance or voltage.

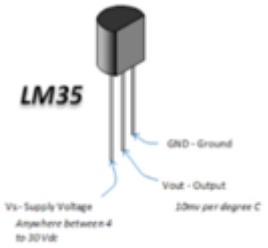

Figure 1: LM35 Temperature Sensor

2. Soil Moisture Sensor:

The Soil Moisture sensor is used to measure the water content (moisture) of soil. The working of Soil Moisture sensor is very similar to a sensor built out of LM393 IC. The only difference can be in the type of outputs sensor offers or gives.

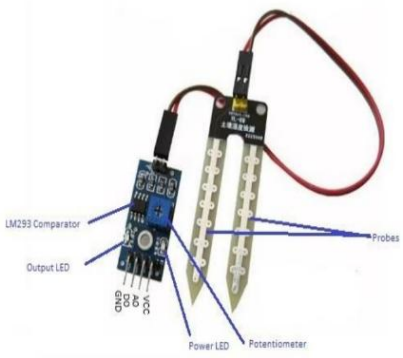

Figure 2: LM393 Soil Moisture Sensor

3. Passive Infrared Sensor:

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating. PIR sensors detect general movement, but do not give information on whom or what moved. For that purpose, an imaging IR sensor is required.

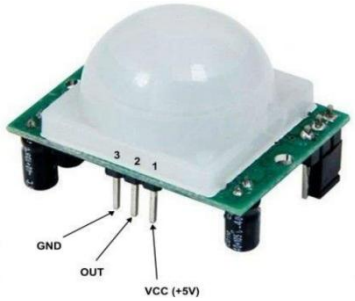

Figure 3: PIR Sensor

III. SYSTEM ARCHITECTURE

Arduino Uno

The Arduino Uno is an ATmega328-based microcontroller board. It contains 14 digital input/output pins (including 6 PWM outputs), 6 analogue inputs, and a 16 MHz crystal. An oscillator, a USB port, a power jack, an ICSP header, and a reset button are all included. It includes everything to power the microcontroller, simply attach it to a computer via USB connection. To get started, you'll need an AC-to-DC adaptor or a battery.

In Italian, "uno" means "one," and it was chosen to commemorate the imminent introduction of Arduino 1.0. Moving forward, the Uno and version 1.0 will be the reference versions of Arduino. The Uno is the most recent of a series of USB Arduino boards, and the platform's reference model; see the index of Arduino boards for a comparison with previous generations.

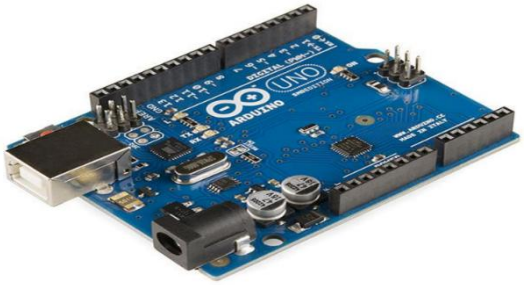

Figure 4: Arduino Uno Board

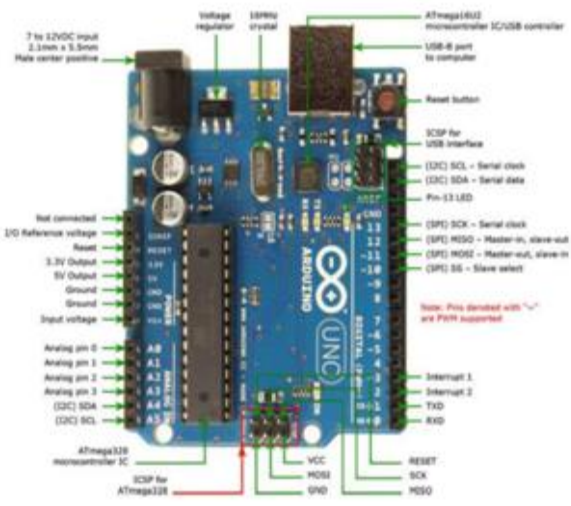

Figure 5: Schematic Pin diagram for Arduino Uno Board

Connection of sensors with Arduino Uno

1. LM35 Temperature sensor with

Arduino Uno The LM35 series are precision integrated-circuit temperature devices having a linearly proportional output voltage to the temperature in degrees Celsius. National Semiconductor's LM35 is a three-terminal linear temperature sensor. It can detect temperatures ranging from -55 to +150 degrees Celsius. The LM35's voltage output increases by 10mV for snipevery degree Celsius as the temperature rises. The LM35 can be powered by a 5V source and consumes less than 60uA in standby mode.

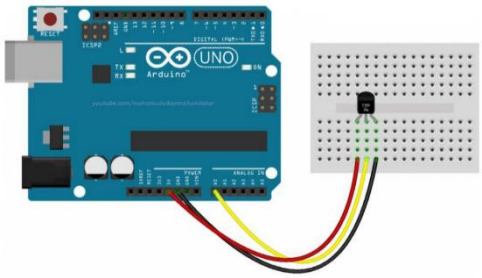

Figure 6: LM35 Temperature sensor with Arduino Uno

2. LM393 Soil moisture sensor with Arduino Uno The soil moisture sensor operates in a fairly simple manner. The fork-shaped probe, which has two exposed conductors, works as a variable resistor (similar to a potentiometer) whose resistance fluctuates with soil moisture content.

The more water in the soil, the better the conductivity and the lower the resistance
The lower the water contents in the soil, the lower the conductivity, and the higher the resistance. According to the resistance, the sensor provides an output voltage, which we may measure to estimate the moisture level.

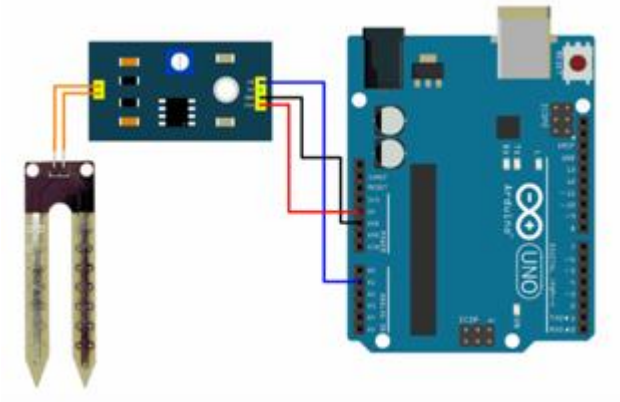

Figure 7: LM393 Soil Moisture sensor with Arduino Uno

3. PIR sensor with Arduino Uno

Infrared heat radiation is detected using a PIR sensor. As a result, they may be used to identify moving live organisms that generate infrared heat radiations. When a PIR sensor detects motion, its output (in terms of

voltage) is high; when there is no motion, it is low (stationary object or no object).

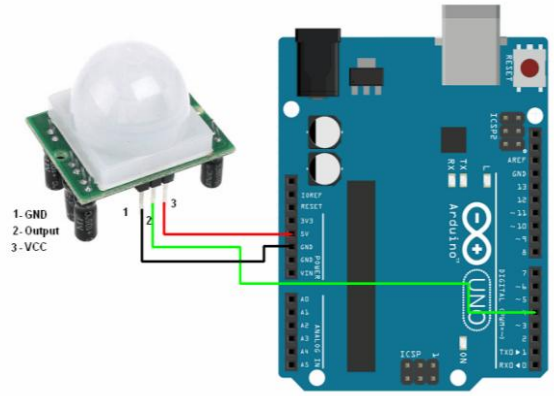

Figure 8: PIR sensor connected with Arduino Uno

FLOW CHART:

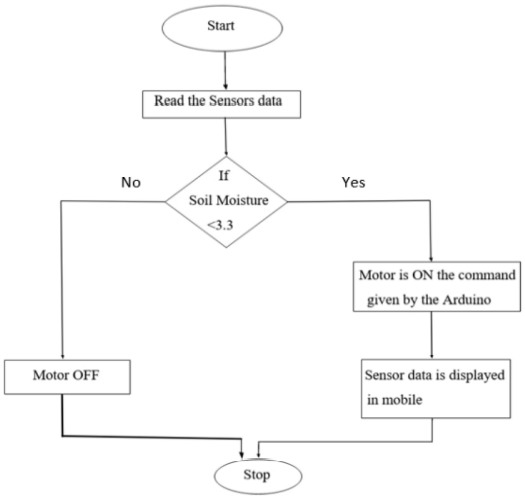

Figure 9: Flowchart for working model

Block diagram:

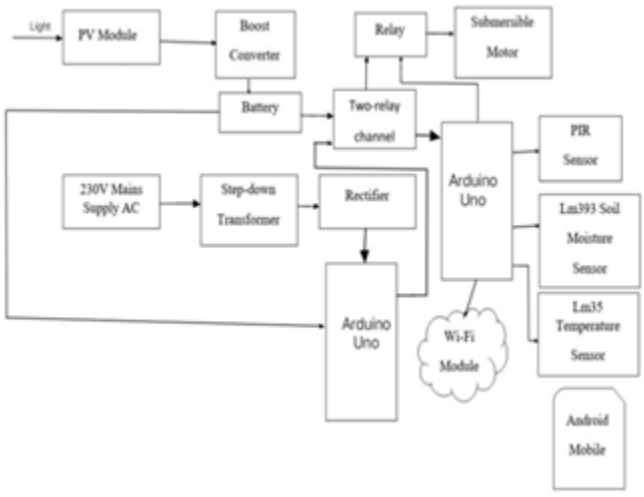

Figure 10: A Block diagram

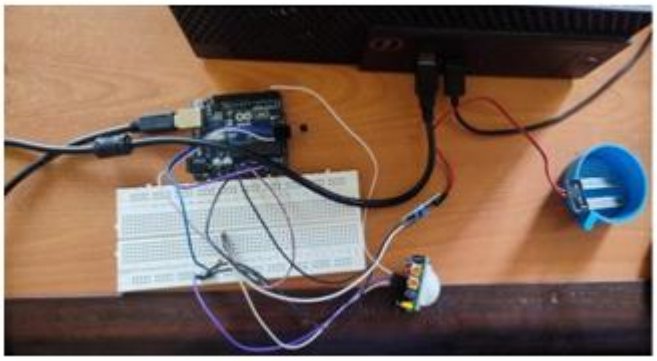

Figure 11: Connection of sensors with Arduino uno

Operation:

By introducing the two power sources i.e.., 230V regular supply along with solar PV module as shown in block diagram, it leads continuous power supply to monitor the Fields and by the help of some sensors. The 230v supply is stepped down by using step-down transformer and from then rectifier is connected to convert the required ac to dc and then connected to raspberry pi and to two channel relay and finally to fields. If any power source is absent or any fault occurs, the second source delivers the power. This can be done by raspberry pi and two channel relay. If fault occurs at 230v supply, the raspberry pi will send the message to the will relay channel 1 to high So, the voltage stored in the battery 4can finally deliver power to 12v submersible pump. From the submersible pump the water will be transferred to the garden. Arduino uno takes the input from two channel relay and based on the sensors output which is connected to Arduino, the relay will operate and from that relay connected to pump, the motor will operate. If the both power sources are active then two relay channel itself actives either solar supply or 230v by the condition a=b. This can easily estimate the real-time conditions of the garden by keeping various types of sensors thus, leads to reduce wastage of water and by transferring the water to the fields whenever water is needed. Throughout by this the one can able to monitor his gardening field every time which will be more beneficial.

Sensors Results:

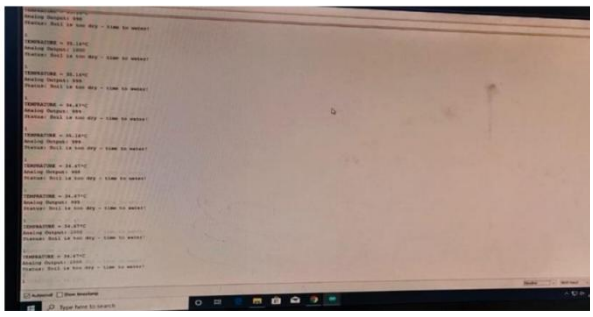

Figure 12: Sensor outcomes

CONCLUSIONS AND FUTURESCOPE

For future developments it should be install in every building to get their food which is free from chemicals. Also the system can be integrated to check the moisture

of the soil. The sensors are successfully interfaced and wireless communication is achieved through Wi-Fi module. All observations and experimental tests prove in my project and it is a complete solution to field activities and even for irrigation problems also. Implementation of this system in the field can definitely help to improve the yield of the crops and overall production and also it can implemented in large acres to farming, detect the soil moisture levels and automatically switch on motor in the fields and it's very useful of this project to every farmer.

References

[1] IoT based smart Agriculture system G. Sushanth and S. Sujatha
[2] Design of Solar Powered Automatic Irrigation System Piyali Das1, S Farishta Devi2 Dept. Of Electrical Engineering Nirjuli, Arunachal Pradesh, India
[3] Smart Irrigation system for precision agriculture-The AREThou5A IoT Platform Achilles D. Boursianis, Maria S. Papadopou lou
[4] A self powered real time, LoRaWan IoT based soil health monitoring system S.R. Jino Ramson, Walter D. Leon-salas, Zachary Brecheisen (members of IEEE)
[5] A Survey on the role of IoT in Agriculture for the implementation of smart farming Muhammad shoaib Farooq, Adnan abid, Shamyla riaz
[6] IoT based Monitoring system in smart agriculture Prathibha sri, Anupama Hongal, Jyothi