IOT based Motor Pump Set Operating System

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*Abstract— **In India, agriculture in villages plays an essential role in developing the country. Basically, agriculture depends on the monsoons which have not enough water sources. To overcome this problem, the irrigation system is employed in the field of agriculture. In this system, based on the soil type, the water will be provided to the agricultural field. In agriculture, there are two things, namely, the moisture content of the soil as well as the water level in water source. At the present time, there are several types of techniques available for irrigation to reduce the need for rain. This type of technique is driven by on/off schedule using electrical power. This project is about the implementation of a IOT Based Motor Pump Set Operating. The hardware and software requirements of this project include soil moisture sensor, Water level sensor, Wi-Fi module ESP8266, Arduino CC(IDE), Android studio, and MIT app creator, etc. This project can be enhanced by designing this system for large acres of soil. Also, this project can be incorporated to make sure the value of the soil and the expansion of harvest in each soil. The microcontroller and sensors are successfully interfaced and wireless communication is attained between a variety of nodes.***

*Keywords— **Water level sensor, Wi-Fi module ESP8266, Arduino CC (IDE), Android studio***

I. INTRODUCTION

India is the country of village and agriculture plays an important role for development of country. In our country, agriculture depends on the monsoons which has insufficient source of water. So the irrigation is used in agriculture field. In Irrigation system, depending upon the soil type, water is provided to plant. In agriculture, two things are very important, first to get information of about the fertility of soil and second to measure moisture content in soil. Nowadays, for irrigation, different techniques are available which are used to reduce the dependency of rain. And mostly this technique is driven by electrical power and on/off scheduling. In this technique, water level sensor placed in water reservoir and soil moisture sensors are placed root zone of plant and near the module and gateway unit handles the sensor information and transmit data to the controller which in turns the control the flow of water.

II EXPERIMENTAL SETUP

A. List of Components.

Table 1. List of components

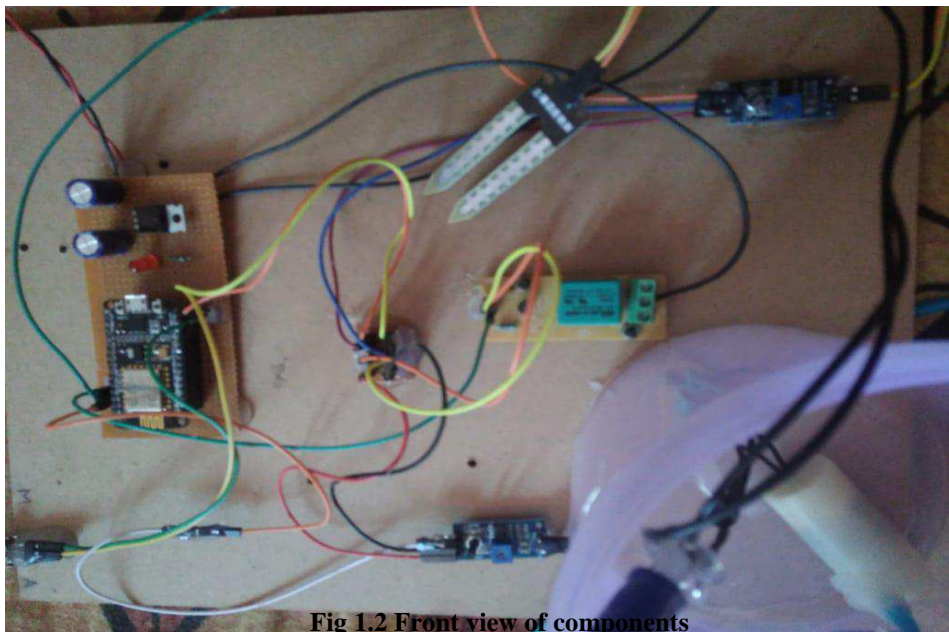| Components	Quantity
Explore ESP8266 Wi-Fi Module	1
Relay Switch	1
Soil Moistere sensor	1
Motor Pump	1
Water level Sensor	1
Power Adapter	1

III CIRCUIT CONNECTION PROCEDURE

Step 1: Make the connection in PCB board as shown in fig. 3.1 and verify results**.**
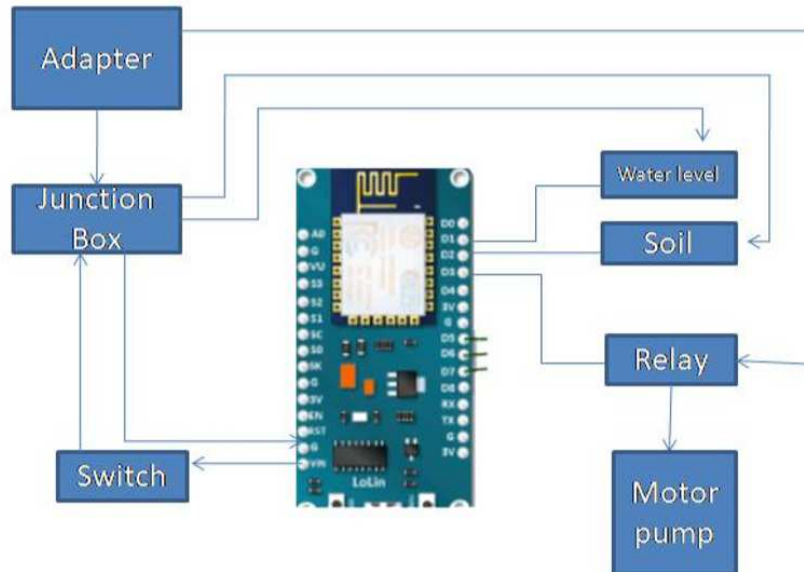
Fig 3.1 Circuit diagram

Step 2: Place the components and carefully solder them. Front views are shown in fig. 3.2.

Fig 1.2 Front view of components

Fig 3.2 Diagram with components

Step 3: Make the complete connections to Wi-Fi module, i.e. connect the water level sensor, soil moisture sensor, relay switch.

Step 4: Connect the power supplies to output ends of relay switches as mentioned in the circuit diagram.

IV PHYSICAL CONNECTIONS

Physical connections include the placing the sensors in small model of agriculture field and includes proper connections. Detail is given below

1. The field includes one Region and a water reservoir.
2. Submerse the submersible motor pump in the reservoir.
3. Place the valve in field Region.
4. Make proper pipeline connections from motor pump to field.
5. Place the water level indicator in the water reservoir.
6. Place the soil moisture sensor in field near the roots of the plants.
7. Give all required supply voltages.

V. RESULTS

Wi-Fi module has to connect the internet by an internet service provider like mobile hotspot, Wi-Fi router.

Operating modes: a) Automatic Mode

                  b) Manual mode

A. Automatic Mode

1. NodeMcu ESP8266 detects the digital signal from soil moisture sensor and water level sensor.
2. If the soil is dry, water in the tank is high then the Wi-Fi module sends signal to relay to turn on the motor then the motor will turn ON automatically.
3. If the following two conditions (soil is wet, water level is low) or any of them occurs then the Wi-Fi module send signal to relay to turn off the motor automatically.

B. Manual Mode

1. NodeMcu ESP8266 receive the signal given by human from mobile application and detects the signal from water level sensor.
2. If we give the signal to turn on the motor, then NodeMcu ESP8266 will check the water level in the tank. If the water level is low , then the motor will remains in turn off state otherwise the motor will turn on.
3. If we give the signal to turn off the motor, then NodeMcu ESP8266 will send signal to relay to turn off motor.
4. In running state when water level is decreased in the tank, then the motor will turn off automatically.

C. Controlling The Module Using Android App

MIT app inventor is a free android app creator based on user requirements. The service is provided by MIT software.

Step 1: Initial setupsin app are to make. Go to website>>URL>>www.mitinventor.com>> create new.

Step 2: Design app as you require by using all elements in the website

Step 3: Go to build>> save to computer as apk >Then app will created

Step 4: Install app in android mobile and change hotspot details as in program.

Step 5: Wi-Fi module automatically connected to your android mobile, now app can control the module.

VI. CONCLUSIONS

Present IOT technology is in initial stage. In future this technology will lead the world. A separate internet connections are maintaining to move forward IOT technology. Agricultural sector is in developing stage so this type of projects will helps in smart irrigation. A farmer should visualize his agricultural land moisture content from time to time and water level of source is sufficient or not. IOT based motor pump set controlling project can be handled easily with mobile anytime and anywhere. The main objective of this IOT Based Motor Pump Set Operating is to make it more innovative, user friendly, time saving and more efficient than the existing system. Measuring two parameters such as soil moisture, Water level in source and the system also includes intruder detecting system. Due

to server updates farmer can know about crop field nature at anytime, anywhere. We can conclude that this system is easy to implement and time, money and man power saving solution for irrigating fields.

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