SMS BASED REMOTE AGRICULTURE PUMP ON/OFF CONTROL AND NOTIFICATION

Ch. SUBRAHMANYAM, M BHARGAVI, R NIKITHA, R ANUHYA
Department of Electronics and communication Engineering
Vignan Institute of Technology and Science, Yadadri Bhuvangiri, Telangana, India

ABSTRACT:

India is rich in culture and values. In India, agriculture plays a major role and its economy depends on agriculture. In agriculture, water is an important parameter to get better production. In our proposed system, the motor is used to irrigate the fields and water flow in both the fields can be controlled with solenoid valve. When the soil in the field-A is in a dry condition, the controller automatically turned the pump ON and farmer also receives a message with the help of GSM to intimate the farmer regarding the status of field. When field-A is in wet condition the controller automatically turns OFF the pump. Wet/Dry condition of soil can be known with the help of soil moisture sensor. There is another case which is included here, where a farmer can forcefully turn ON the pump by sending ON message to the controller with the help of GSM.

KEY WORDS:

Submersible Pump, Arduino uno (controller), Soil moisture sensor, Message, GSM and Solenoid valve.

1. INTRODUCTION

Agriculture is backbone of India because it is one of the main parameter which decides the economic growth of the country. Agriculture plays a key role in India when compared with others. In India agriculture is decreasing day to day because of reduce in underground water level and inappropriate rainfall due to environmental conditions.

To obtain maximum yield this system (project) is proposed. This project is designed with affordable cost, Arduino is used to monitor the pump based on ON/OFF condition of relay, Soil moisture helps farmer to manage their field more efficiently and GSM is used to send message to farmer. Based on soil condition water is supplied to field to get maximum yield and plant growth.

Farmers work day and night to obtain maximum production but due to some parameters like natural hazards and improper water supply to fields. To avoid above problem agriculture based remote ON/OFF pump control and notification system is designed so water can be supplied to plants or crops with proper time interval.

2. LIERATURE SURVEY

S. Gokulanathan, 2019[1] presented water quality monitoring system via online with the help of GSM and to monitor the other parameters via data in IOT. The main reason to introduce this system is due to decrease of water quantity due to rapid rise of population and to utilize water properly for agriculture, industrial and personal use.

Hajar M. Yasin, 2019[2] as people is getting busy. To make it easier to farmer, to irrigate field from their home or at any place, this system is developed. Farmer can monitor the field by sending instruction to Arduino via GSM by mobile and drop sensor module is added to the proposed system to disable the irrigating fields by sending SMS via GSM.

S. Manikandan, 2019[3] presented to obtain maximum yield by enhancing activities like spraying water and pesticides with the help of drone. Communication between the Unmanned Aerial Vechicle and user plays a major role. Here Arduino is used to control the drone and additional sensors and devices are supported by Pixhawk Flight Controller.

Ipin Prasojo, 2020[4] to not cause any loss to farmer during summer/winter season this system is implemented. In this system instead of monitoring the field manually to monitor automatically by the system based on soil wet/dry condition by using soil sensor and data is sent to controller.

Dr. Preeti Savant, 2022[5] rapid increase of population leading to shortage of water and food to overcome these problems, this system is implemented. Where it saves the time of the farmer/person. In this system water is automatically supplied to fields when the moisture of the soil is less than the predefined threshold value and motor is automatically turned off if there is no need of water supply.

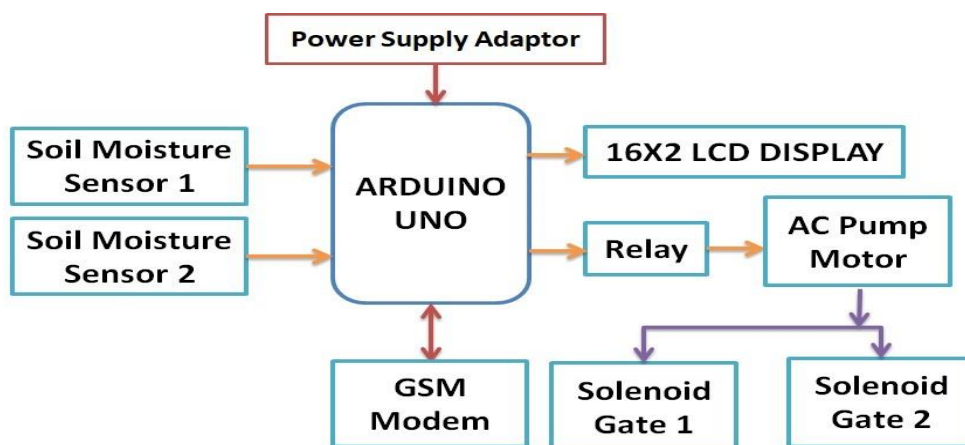## 3. IMPLEMENTATION

BLOCK DIAGRAM:

Fig: Block diagram of proposed system

In our designed system moisture of the soil can be continuously monitored with the help of soil moisture sensor. Based on the predefined value of the concerned crop in Arduino and data sent by soil moisture sensor to Arduino is compared, then pump will be turned ON/OFF and message will be sent to farmer mobile via GSM module regarding the status of the field by the Arduino uno (ON/OFF). In our proposed system consist of two fields that is field-A and field-B. Based on the moisture of the soil (field-A and field-B) concerned crop will be irrigated. Until moisture of the soil is reached to required level, water to supplied to concerned crop (field-A and field-B). There is another case where, farmer has power to operate the system based on his requirement by sending SMS to Arduino via GSM.

POWER SUPPLY : With the help of Regulated Power Supply AC power is converted to DC power. RPS consists of step-down transformer, rectifier, DC filter, Regulator. Step-down transformer is used to step down voltage to required voltage level.

Rectifier converts alternate current to direct current. DC filter is used to remove ripples from waveform and to avoid fluctuation due to change in input is done by regulator.

SOIL MOISTURE SENSOR INTERFACING WITH ARDUINO: When soil moisture sensor is interfaced with arduino, it continuously monitors the moisture present in soil and sends data to arduino. Moisture present in the soil is measured by the parameters like electrical resistance, dielectric constant etc.

LCD INTERFACING WITH ARDUINO: Liquid Crystal Display (16*2 LCD) is interfaced with arduino with the help of I2C inorder to make connection easy .It is used to display the status of the pump (ON/OFF).

GSM MODEM INTERFACING WITH ARDUINO: GSM modem is interfaced with arduino to send message to farmer's mobile and farmer can forcefully ON the motor by sending SMS via GSM.

RELAY INTERFACING WITH ARDUINO: Relay is interfaced with arduino, based on output of soil moisture sensor relay is used as switch.

SUBMERSIBLE PUMP INTERFACING WITH ARDUINO: Ac pump is used to pump water from ground to surface.

SOLENOID VALVE INTERFACING WITH ARDUINO: When soil moisture senses the moisture present in the soil is low it sends information to the arduino. Arduino receives information and pass commands to solenoid valve. When it receives that moisture is low .It allows flow of fluid from the inlet port to the outlet port.
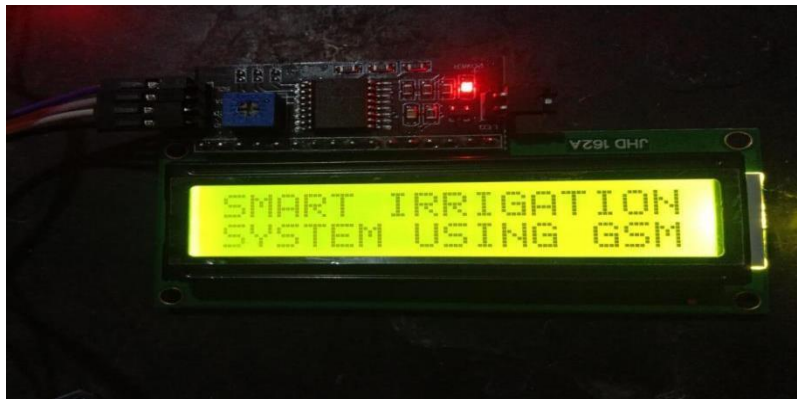
4. RESULT

The results obtained by this system are

Fig 1 Project name display

When system is turned on project name is displayed on LCD.

Fig 2 System ready

GSM Searching for the signal to send message to the farmer.

Fig 3 Sending message

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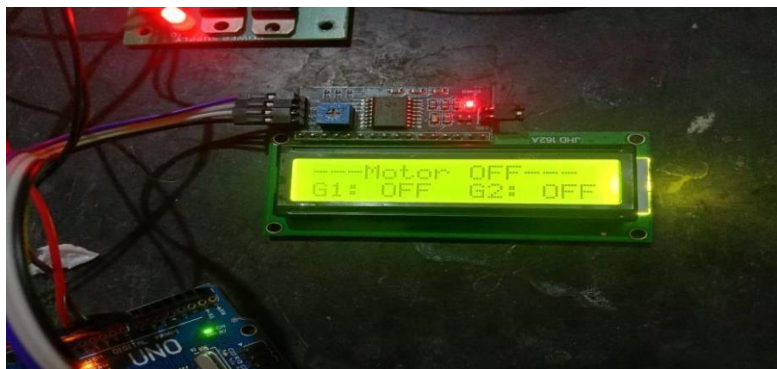

Fig 4 Message sent

Fig 5 Status of motor

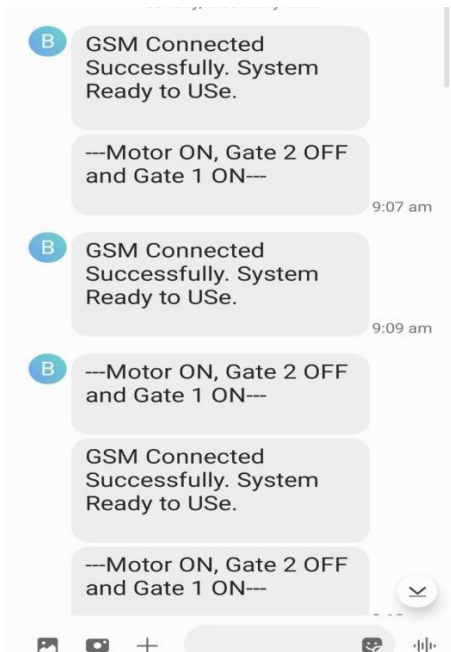Based on the status of the field message is sent to user mobile via GSM.
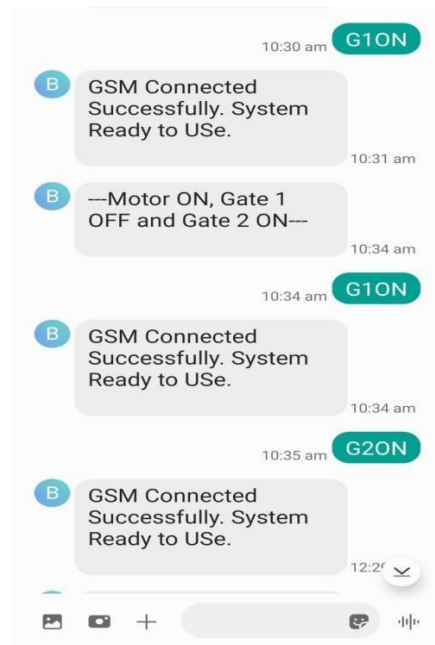

Fig: 1

Fig: 2

Fig 1 shows message sent to farmer mobile when motor turned on and also the status of the gate based on soil moisture sensor output. Fig 2 shows if farmer wish to turn on motor. Even though soil in wet condition he can do this by sending SMS (indicating the gate number which he wants) and turn on the motor .In return GSM sends the message regarding the status of gate.

5. CONCLUSION

This system is proposed to decrease the work load for the farmer and to produce maximum production. By using this system water is supplied to required field automatically without any human interaction. The main aim of this proposed system is to solve water wastage problem during irrigation and for dry areas to supply sufficient water to increase an efficiency of irrigation process. Moreover, Components used in this system are low cost. This system not only designed for farmers but also used in building construction, in pisciculture and in greenhouse plant. Due to advancement of technology day by day, time and money parameters plays an important role in every one's life. This project is designed based on above mentioned reason.

6. FUTURE SCOPE

The scope of our project "SMS BASED REMOTE AGRICULTURE PUMP ON/OFF CONTROLAND NOTIFICATION" The future implications of the project are very great considering the amount of time, money andresources it saves. The project we have undertaken can be used as a reference or as a basefor realizing a scheme to be implemented in other projects of greater level such as GSM pump controller, weather updates using mobile p hones, pest control, control farmingvehicles using mobiles.

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