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Arduino based plant watering system with color changing LED on detection dry or wet condition.

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Abstract- *This project is design in order to create system that is simple and highly functional for the purpose of maintaining well being of plant life and also reduce wastage of water. This paper to discuss the design of Arduino based plant watering system with color changing LED on detection dry or wet condition. The India is agriculture based country and the agriculture is a source of live hood of majority Indians and has great impact of economy of the country. The man power and reduce the cost of irrigation system. In the dry area, growth of plant is difficult so, we need to automated plant watering system with detect dry or wet condition of soil.*

Keywords: Arduino, moisture sensors, Real time Clock, water pump, LCD display etc.

1. Introduction:

Now a day, in the field of agriculture the farmers are facing lots of problem in watering their crops. It is because of famers do not have any proper idea about the management of plant watering system. Thus they loss their important time and work. But, there is solution of an arduino based plant watering system not only solves the problems of farmers but also other for watering their frames as well. This project include different block like arduino, moisture sensor, display etc. The arduino is used for controller to process the information and the soil sensor is used for the detect the dry or wet condition of soil and also use RTC in the project diagram which is use for showing the real time and date. This project helps to famers managing water to the crops field and further maintain the moisture level of soil that helps in crops better production.

2. Block Diagram:

The Arduino based irrigation watering system is shown below Arduino UNO is used with programming code which drives the whole system.

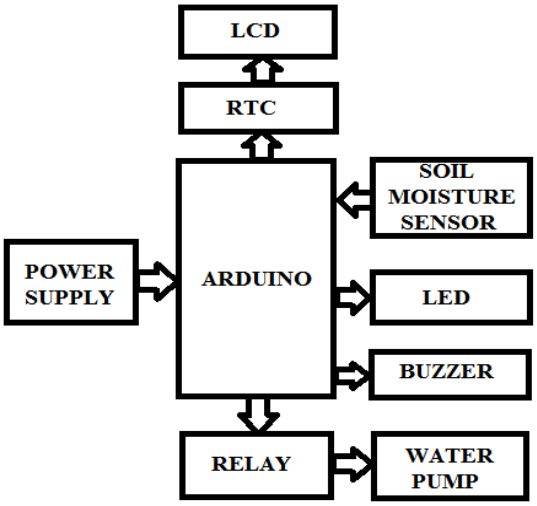

Fig2.1: Block Diagram

3. Methodology:

Sensor module:-

The Soil moisture sensors determines the water present in soil. It operate on 5v supply which will use analog as well as digital pin. The fig.2.2 show the diagram of sensor module.

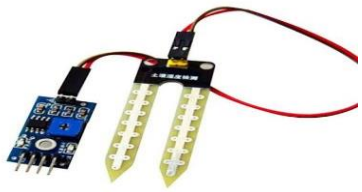

Fig.2.2:- Soil Moisture sensor

The soil moisture sensor used the LM393 driver circuit and capacitive plate. In the soil moisture sensor the capacitive plate is sense the volumetric water content which will be present in soil i.e. it sense the dry and wet condition of soil.

The sensed current status is give to the driver circuit (LM393) which will be compare the current status and set threshold status and compare value will give to the arduino.

Arduino:-

Arduino is the main basic block of this project. This has all the controls about the different inputs. That is, it takes the various inputs and process on that and gives the output. The fig.2.3 show the diagram of Arduino.

Fig2.3: - Arduino

In this the arduino take the input from the sensor and according to the condition of the soil it controls the ON/OFF of the water pump and gives the indication by the different colour LED's. Also it connect with RTC which will be use for giving real time clock and date shows through LCD display. But, this all operating thing will manage by arduino.

Relay:-

The relay is used to provide the isolation between the two different devices. In that the we can't able to give the commands to the motor directly so we using the relay to drive the motor. Fig.2.4 show diagram of Relay.

Fig2.4:- Relay

Water pump:-

The water pump is main object in this project. The fig2.5 show the diagram of water pump.

Fig2.5:- water pump

The water pump takes input from the arduino through relay. According to that input it turn ON/OFF for the irrigation purpose.

LEDs:-

The LED's are used for the indication purpose to indicate that the different conditions of the soil.

Fig2.6:- LEDs

The fig.2.6 show the diagram of LED's. Here we are using the different colored LEDs for the indication purpose like RED LED for Dry condition, Blue LED for soggy soil and Green for the moist condition.

LCD display:-

The LCD stands for liquid crystal display which is a display. There are different types of LCD's, but we use 20*4 LCD display. The LCD are use in wide range of application in digital cameras, digital watches, calculators, mobile telephone and also including the Smartphone's, DVD player, video game devices.

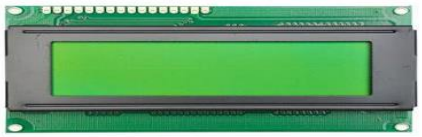

Fig2.7:-LCD display

The fig.2.7 show the diagram of LCD display. In simple LCD display is used to dislpay information abot the different conditions of the soil. It aslo shows the real time and date using RTC component.

RTC:-

The RTC stand for Real Time Clock that keep the current time. RTC are almost present in any electronic devices which needs to keep accurate time. In the RTC use DS1307 which is inexpensive I2C real time clock. The fig.2.8 show the diagram of RTC.

Fig2.8:RTC

Buzzer:-

Buzzer is an audio signalling device, which will be mechanical, electromechanical, or piezoelectric. The Buzzer is typically used in alarm devices, timer. In this project it will work as a only indication in the form of audio signal when sensor detect the dry condition, otherwise in OFF condition. The fig.2.9 show the diagram of Buzzer.

Fig2.9:Buzzer

Conclusion:-

The primary applications for this project are for farmers and gardeners who do not have enough time to water their crops/plants. It also covers those farmers who are wasting the water during irrigation.

As water supplies become scarce and polluted, there is a need to irrigate more efficiently in order to minimize water use and chemical leaching. Recent advances in soil water sensing make the commercial use of this technology possible to automate irrigation management for vegetable production. However, research indicates that different sensors types perform under all conditions with no negative impact on crop yields with reductions in water use range as high as 70% compared to traditional practices.

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