Intelligent Water Management and Controlling In Agriculture

Abhishek Mahajan, Maya Mahadik, Pooja Lande, Prof.Dipak Raskar

Abstract— Achieving effective and efficient management of the water as the key to human survival and development has emerged as an urgent global concern. As WATER is a precious resource on the planet earth. For the effective management of the water monitoring should be done properly. The design broadly consists of three blocks. In the first part we use the sensors which detect the desired parameters, next we process the signals obtained from arduino , the required command will be send to the GSM module to send appropriate message to the appropriate mobile number at regular intervals of time. Due to uneven natural distribution of rain water it is very difficult for farmers to monitor and control the distribution of water to agriculture field in the whole farm or as per the requirement of the crop. Farmers suffer large financial losses because of wrong prediction of weather and incorrect irrigation methods. Sensors are the essential device for precision agricultural applications.

Keywords *:* arduino uno, GSM module, Ultrasonic sensor

1 INTRODUCTION

Water is an essential resource for every living being on this planet .Automatic water level monitoring system project explained here is going to measure the water level of water tank using ultrasonic sensor .The project will automate the water filling in a tank i.e. when the water level reaches up to the brim of the tank, the water level pump will start automatically and when the water level in tank remains up to few cm ,the pump will stop automatically to tank till the water reaches again up to the brim.

2 HARDWARE REQUIRED:

1. Arduino UNO Board: This is a microcontroller board required for coding and it has input/output pins for connecting other required accessories.
2. Ultrasonic Sensor: This is a sound based sensor for measuring the water level in a tank.
3. LCD Display 16 x 2: This is required to display the values and other information for user.
4. Relay: Relay acts as an electromagnetic switch, it is the voltage that controls the voltage action.
8. 12 Volt battery/12 Volt adaptor: It will provide 12V DC supply to the Arduino and other components.
9. Copper wire and connecting wires: Copper wire will be required to connect water pump to 220V AC supply and connecting wires will be required to connect the above components with Arduino.
10. GSM module: A GSM module is being used in this project to send appropriate messages to the appropriate mobile numbers.

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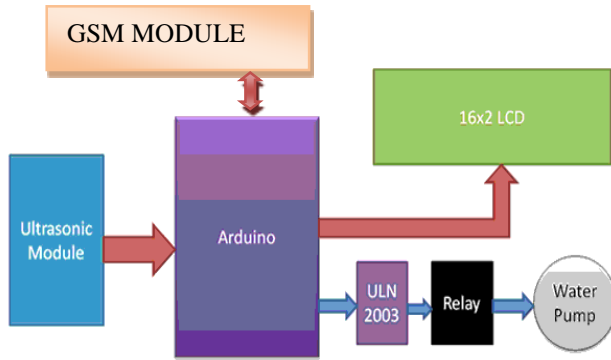## 3 WORKING OF AUTOMATIC WATER LEVEL CONTROLLER

Working of this project is very simple we have used Ultrasonic sensor module which sends the sound waves in the water tank and detects reflection of sound waves that is ECHO. First of all we needs to trigger the ultrasonic sensor module to transmit signal by using Arduino and then wait to receive ECHO. Arduino reads the time between triggering and received ECHO. We know that speed of sound is around 340 m/s. so we can calculate distance by using given formula:
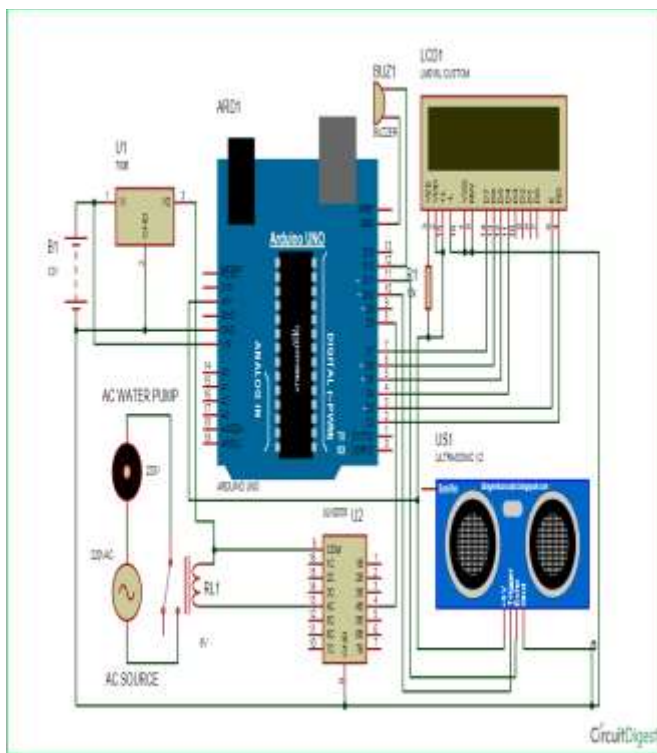
Distance= (travel time/2) * speed of sound

Where speed of sound is approximately 340m per second. By using this method we gets distance from sensor to water surface. After it we need to calculate water level. Now we need to calculate the total length of water tank. As we know the length of water tank then we can calculate the water level by subtracting resulting distance coming from ultrasonic from total length of tank. And we

will get the water level distance. Now we can convert this water level in to the percent of water, and can display it on LCD. The working of the complete **water level indicator project** is shown in below block diagram.

BLOCK DIAGRAM:

4 CIRCUIT DIAGRAM:

5 FUTURE SCOPE:

It is useful for farmer, greenhouse owner to perform their task. This is fully automated system which works with less man power and user can perform the following things:

- Remotely on/off water pump using mobile.
- Observe and look after the farm remotely.
- To schedule the daily farming activities.

The future work is trying to improve the topology structure to make all nodes communicate with each other, also to improve the stability of wireless sensors in communication by better software and hardware design. Especially, a design of smart irrigation control system based on wireless sensor networks and implement irrigation decision by real-time humidity data and expert data. Moreover, design and implementation of software architecture for the smart monitor system need continuous improvement to meet various real demands change the font style.

6 SUMMARY AND CONCLUSION:

Automatic water pump control system employs the use of different technologies in its design, development, and implementation. The system used microcontroller to automate the process of water pumping in an over-head tank storage system and has the ability to detect the level of water in a tank, switch on/off the pump accordingly and display the status on an LCD screen. This research has successfully provided an improvement on existing water level controllers by its use of calibrated circuit to indicate the water level and use of DC instead of AC power thereby eliminating risk of electrocution.

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