

Water Level Control, Monitoring and Altering System by using GSM in Irrigation Based on Season

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Abstract - This paper presents a detailed model of the system which senses the changes like water level and temperature difference using sensors and overflow detection using GSM advanced technology. So there is an important to use the global system for mobile communication (GSM) worldwide for continuous monitoring, controlling and alerting of the dam water level. This advanced technology system uses a short message service (SMS) to directly control and monitor the opening and closing of the shutter of the dam. This system alerts through the SMS, the operator staying nearby places about the rise in water level. Now a day's it is found that temperature sensor senses the changes in atmospheric temperature and take up an appropriate measure like relieving the excess water in the dam for irrigation purpose.

Key Words: PIC Microcontroller, GSM Module, Moisture Sensor, Water Level Sensor, Temperature Sensor

1. INTRODUCTION

Today's need of system, also explained how to implement water level control, monitoring and alerting system with the help of PIC 16F877A, GSM & LM35, moisture sensor. In this chapter we discuss in the existing system of water level control, monitoring and alerting system by using GSM in irrigation based on season. The system sends alerts as SMS broadcast, and opens the shutter. Another useful functionality implemented in the system is the periodic opening and closing of the tunnel pathways using a solenoid valve, to facilitate sufficient water-flow for irrigation [1]. The temperature sensor is used in the system, if it finds the atmospheric temperature to be higher than usual; it increases the duration of opening the solenoid valve so as to ensure sufficient water-flow during harsh climates.

2. LITERATURE REVIEW

[1] T. S. Yuvarani, R. Archana (2016), in their paper has proposed to global system for mobile communication (GSM) is used worldwide for continuous monitoring, controlling and alerting of dam water level. This advance technology uses short message services (SMS) to directly control and monitor. The opening and closing of the shutter in dam. Through the SMS this system alerts the people staying nearby places about the rise in water level. Temperature sensor, sense the

changes in atmospheric temperature and take up appropriate measure like relieving the excess water in dam for irrigation purpose in seasons. This paper gives a detailed model of the system which senses the changes like temperature and water level difference using sensors, and overflow detection using GSM technology.

[2] J. Mounika¹, N. Siva Kumar Reddy (2016), he has proposed his to study the method to check and control water level for irrigation system. The water is a one of the important natural resource and it is an important asset to save the water on the earth. This paper describes the automatic system to monitor and control water level with the help of water level sensors and wireless network system. The need of this paper is to cut water wastage occurs in canal and sub canal, and the WSN system reduces the human efforts.

3. BLOCK DAIGRAM

The proposed system is based on microcontroller (PIC) that monitors the load current of a distribution transformer. It consists of power transformer, Water level sensor, microcontroller (PIC16F877A), LCD display, GSM modem, motor driver, moisture sensor and temperature sensor. We have divided our system into two parts. These are transmitter and another one is receiver.

This transmitter side is dry area. We can have used the temperature sensor, pic microcontroller and moisture sensor. Temperature sensor is sense the temperature of atmospheric and moisture sensor are sense the moisture of the soil. When with the help of this two sensor we can find out the need of water. This information is processed on microcontroller and processing of the data are send with help of the GSM to dam side GSM.

In receiver side water level sensor are used in dam. that find level of the sensor, when level is appropriate the data are processing on pic microcontroller and this is display on LCD and motor driver automatic ON and start the motor the dam sutter are open.

When the rainy season the moisture sensor and temperature sensor are indicate or send the SMS no need of water. This is display on LCD and also automatic motor are OFF.

In this over flow condition of the water are it alert the people with help of SMS and LCD display.

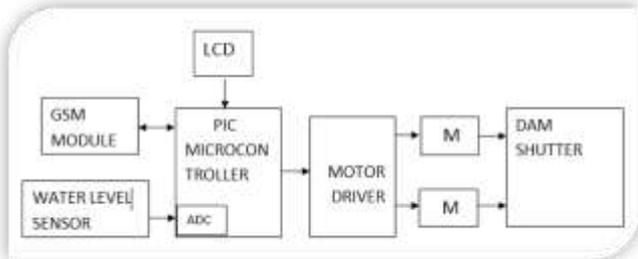


Fig-1: Receiver side

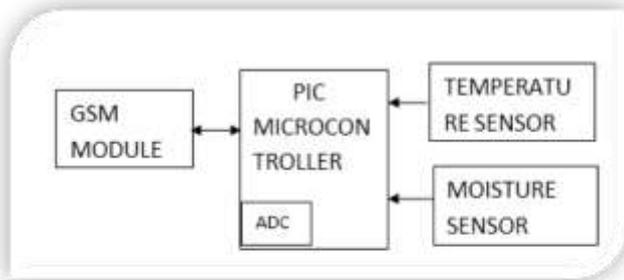


Fig-2: Transmitter side

3.1. POWER SUPPLY

The PIC16F877A need +5V DC, this specification dictates the use of a low-cost regulator LM7805. The LM7805 requires an input voltage of at least 7.5V in order to guarantee regulation, so the unregulated power supply should supply at least this voltage under worst-case current consumption.

3.2. PIC MICROCONTROLLER

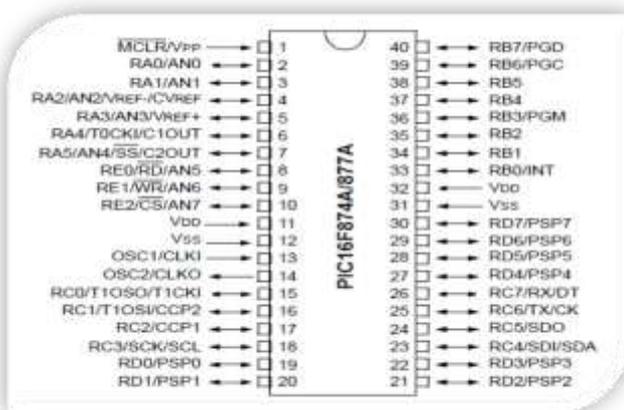
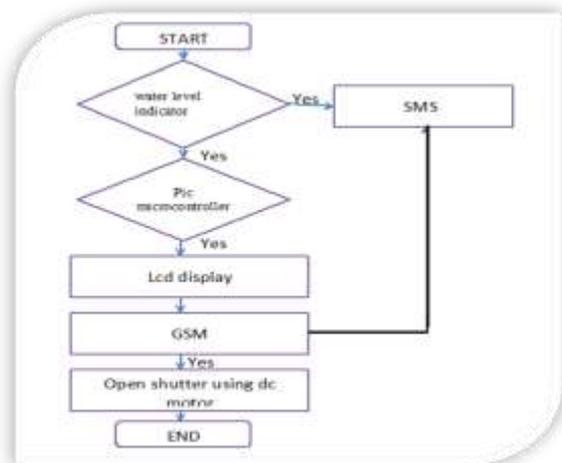


Fig-3: Pin Diagram of 16F877A

PIC microcontroller of series 16F877A is used in the proposed model. PIC16F877A is a small piece of semiconductor integrated circuits. The package type is of the integrated circuits is DIP package. DIP stands for Dual Inline Package for semiconductor IC. This Package is very easy to be soldered onto the strip board. However, using a DIP socket is much easier so that this chip can be plugged and removed from the development board. PIC16F877A IC can be reprogrammed and erased up to 10,000 times. Therefore, it is very good for new product development phase.

4. ALGORITHM FOR MONITORING AND CONTROL

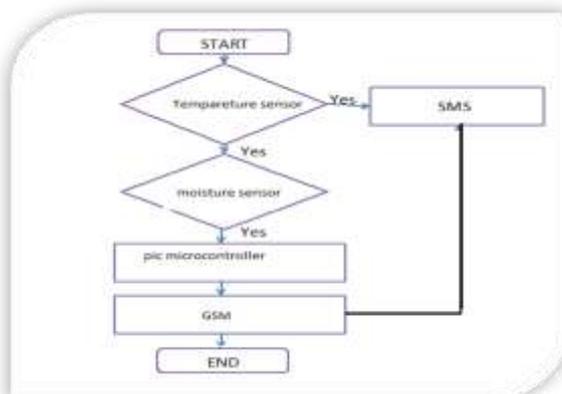
4.1. Flowchart for Receiver Side



Flow chart steps:

- Step 1: Initialize the water level indicator it detects the water level and send SMS to the GSM.
- Step 2: Alert by using SMS.
- Step 3: First it indicates that water levels and display on LCD.
- Step 4: If the water levels are displays and if the water level is appropriate then due to the help of motor driver open the DAM shutter.
- Step 5: Release the water.

4.2. Flowchart for Transmitter Side



Flow chart steps:

- Step 1: Sense the temperature.
- Step 2: Count the moisture in the soil.
- Step 3: All the contents display on LCD.
- Step 4: Send the message through the GSM.

5. SIMULATIONS OF THE MONITORING SYSTEM

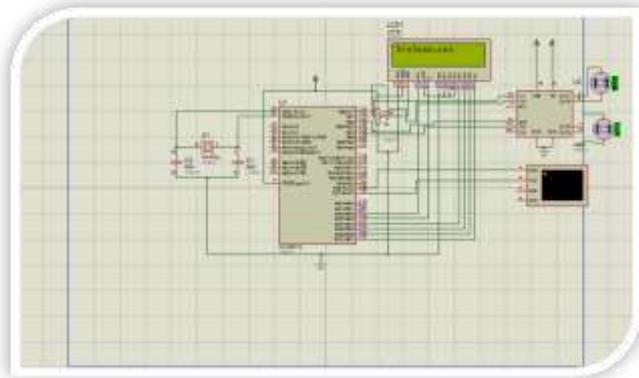


Fig- 4: Simulation of Monitoring System

6. RESULT

The system successfully provides real time monitoring of the water level, temperature and moisture sensors for measuring various parameters like water level, temperature and moisture were successfully implemented. Transmission and reception of data from the sensors to the GSM using PIC microcontroller modules is demonstrated. Automation of flood gates when the water level of the dam exceeds the predefined threshold values is also demonstrated. A predefined SMS using GSM modem is sent when any of the monitored parameters goes beyond the range. Hence by using this monitoring system we can have real time monitoring of various parameters and depending on these observations the concerned authorities are alerted to take the precautionary measures.

7. CONCLUSION

This proposed automated mechanism of water level monitor, control and alerting system using GSM in dams and irrigation system based on season reduces the wastage, ensures efficient use of available water resources and generates more precise and accurate results. There is no requirement of human laborers for monitoring the level, just one operator is sufficient for opening and closing the gate according to sensor output. By increasing the number of level sensors being more, we can open or close the dam gate whenever necessary knowing the accurate level of water.

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