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# AUTOMATIC WATER LEVEL CONTROLLER FOR RESIDENTIAL APPLICATION

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## *ABSTRACT*

*The drinking water crisis in India is reaching alarming proportions. It might very soon attain the nature of global crisis. Hence, it is of outmost importance to preserve water. In many houses there is unnecessary wastage of water due to overflow in Overhead Tanks. Automatic Water Level Controller can provide a solution to this problem. The operation of water level controller works upon the fact that water conducts electricity. So water can be used to open or close a circuit. As the water level rises or falls, different circuits in the controller send different signals. These signals are used to switch ON or switch OFF the motor pump as per our requirements.*

***KEYWORDS:*** *Water Level controller, Wireless, Detector, Interface, Water pump.*

## I. INTRODUCTION

This article explains you how to detect and control the water level in an overhead tank or any other container. This system monitors the water level of the tank and automatically switches ON the motor whenever tank is empty. The motor is switched OFF when the overhead tank or container is FULL. Here the water level of the tank is indicated on LCD (Liquid Crystal Display).
Using this system, we can avoid the overflow of the water. Here we are designing the circuit which is based to detect and control the water level automatically in overhead tank using 8051 microcontroller. In this system, water sensing can be done by using a set of 4 wires which are placed at different levels in tanks. DC supply probe is placed at the base of the tank.

## II. CIRCUIT PRINCIPLE

This system mainly works on a principle that "water conducts electricity". The four wires which are dipped into the tank will indicate the different water levels. Based on the output of these wires, microcontroller displays water level on LCD as well as controls the motors.

### 2.1 Simulation Circuit Diagram

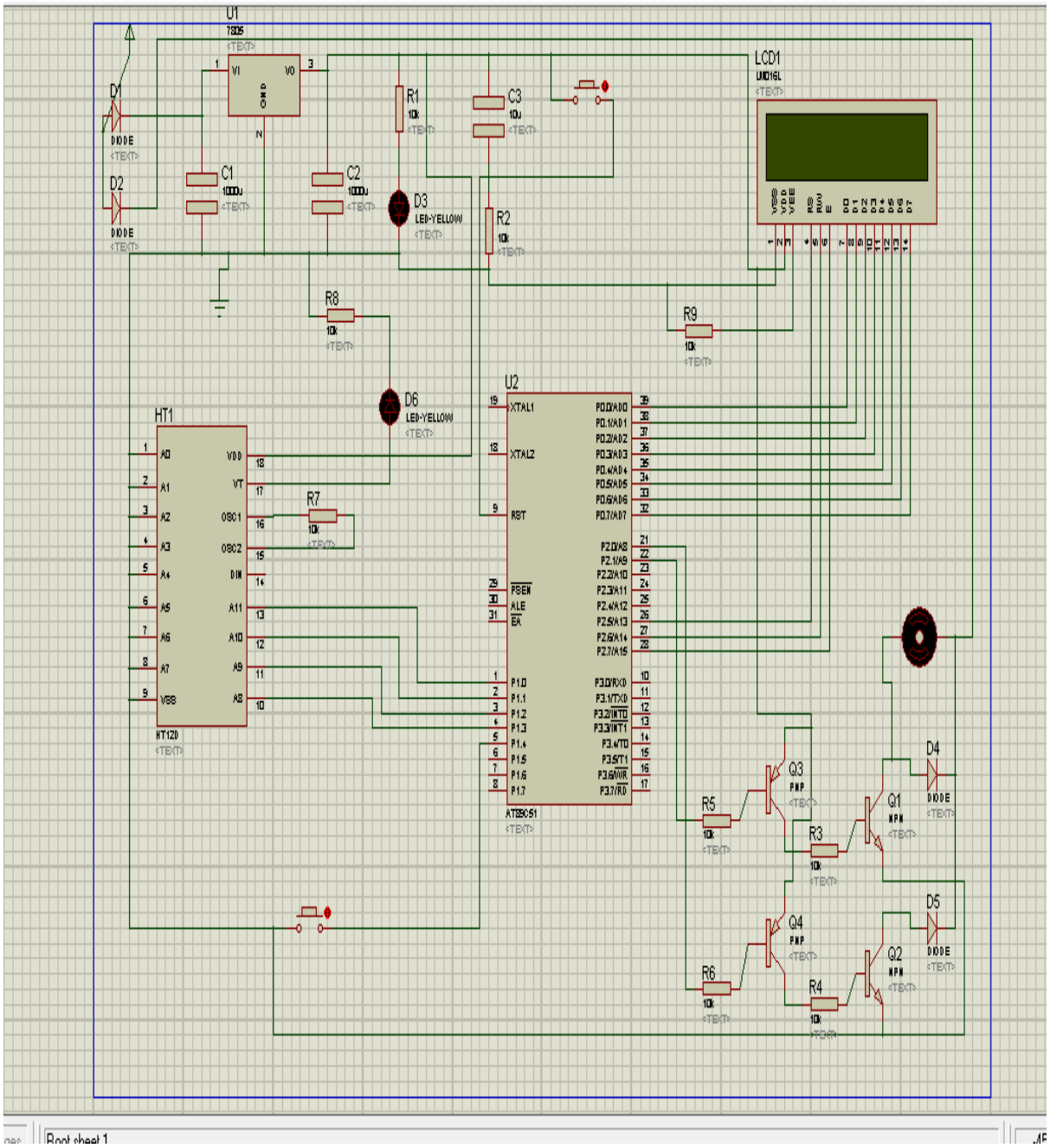


**Fig 1.** Simulation of Receiver Section

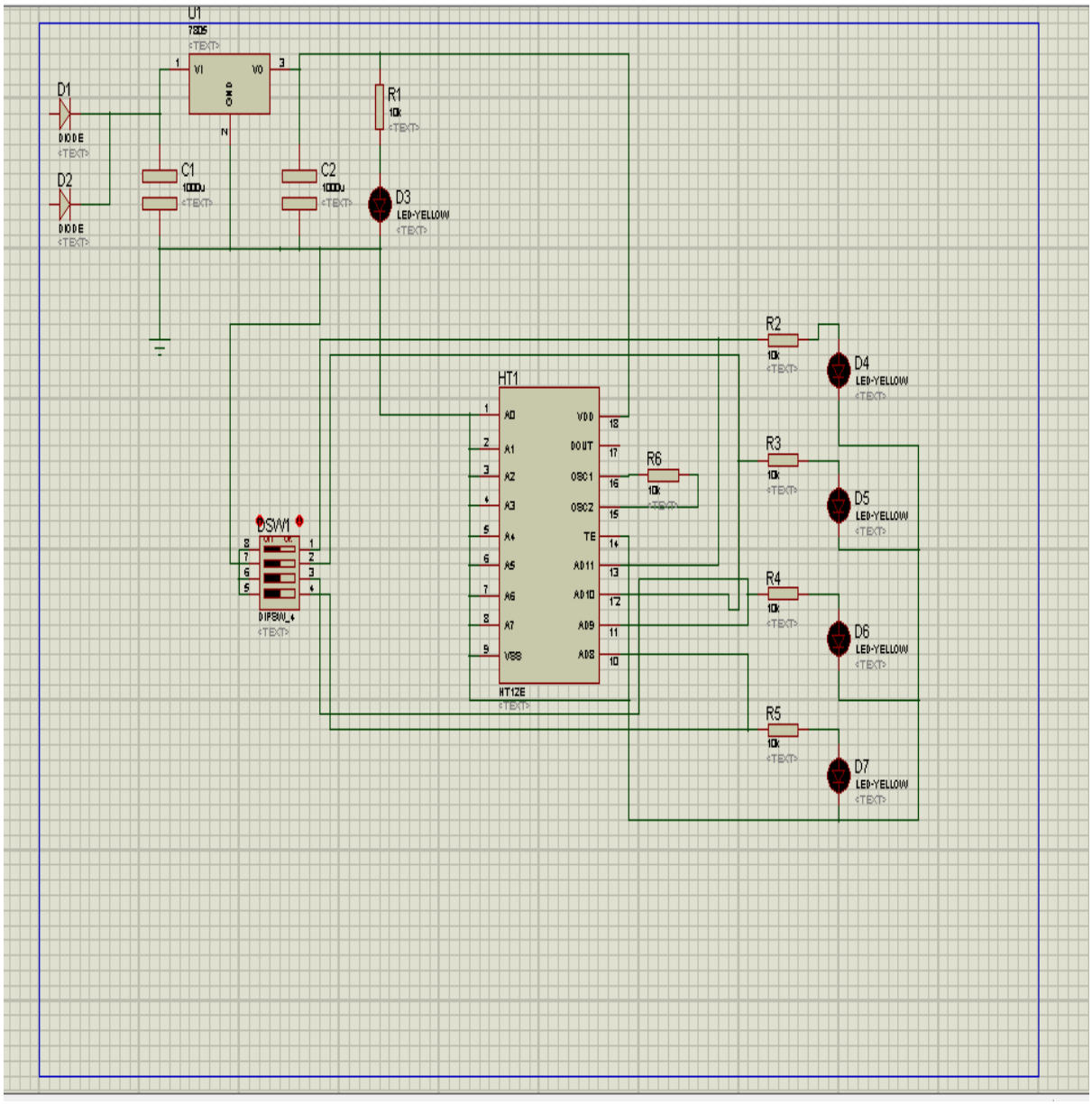


**Fig 2.** Simulation of Transmitter section.

## 2.2 Circuit Design

The main heart of this project is AT89C51 microcontroller. The water level probes are connected to the P3.0, P3.1, P3.2 and P3.3 through the transistor. Port P2 connected to the data pin of LCD and control pins RS, RW and EN of LCD are connected to the P1.0, P1.1, and P1.2 respectively.
Initially when tank is empty, LCD will display the message 00% and motor runs automatically. When water level reaches to 25% level, now LCD display 25% and still motor runs. For further level, LCD display the message 50% and 75% FULL. When tank is full, LCD displays 100% and motor automatically stops. Again motor runs when tank is empty.

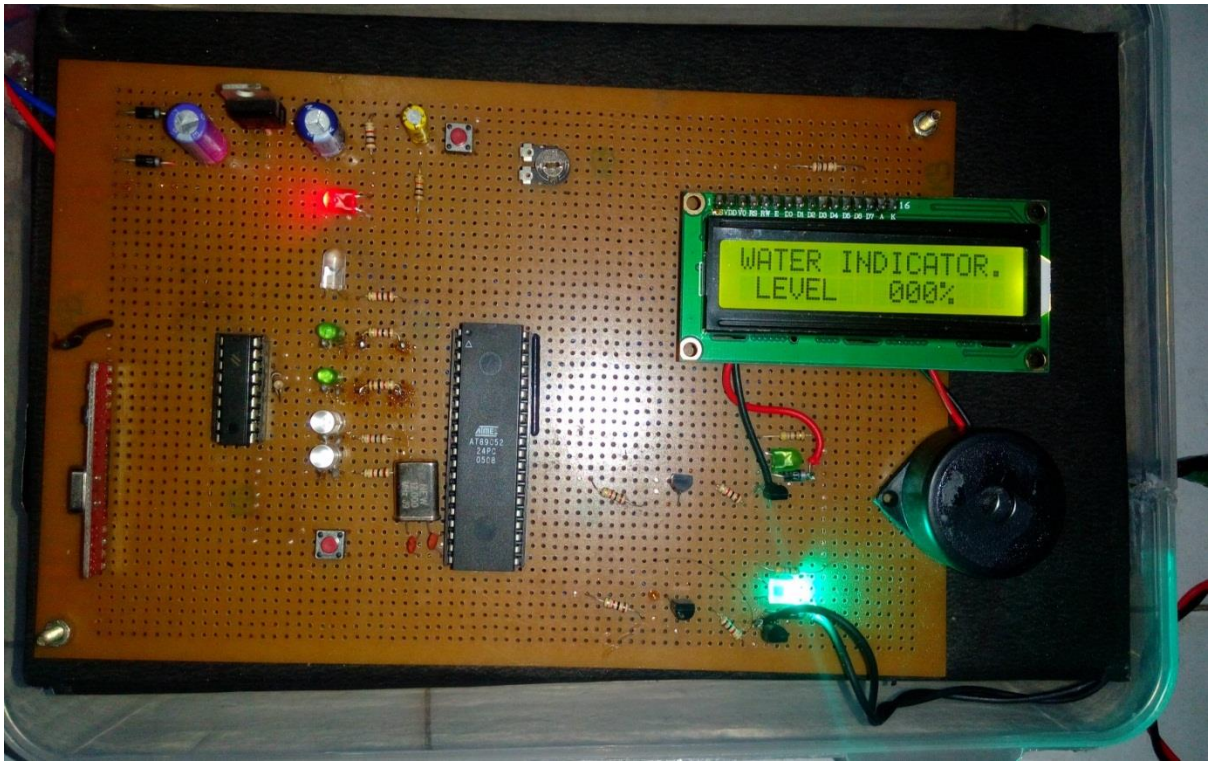


**Fig 3:** Level Indication of Empty tank.

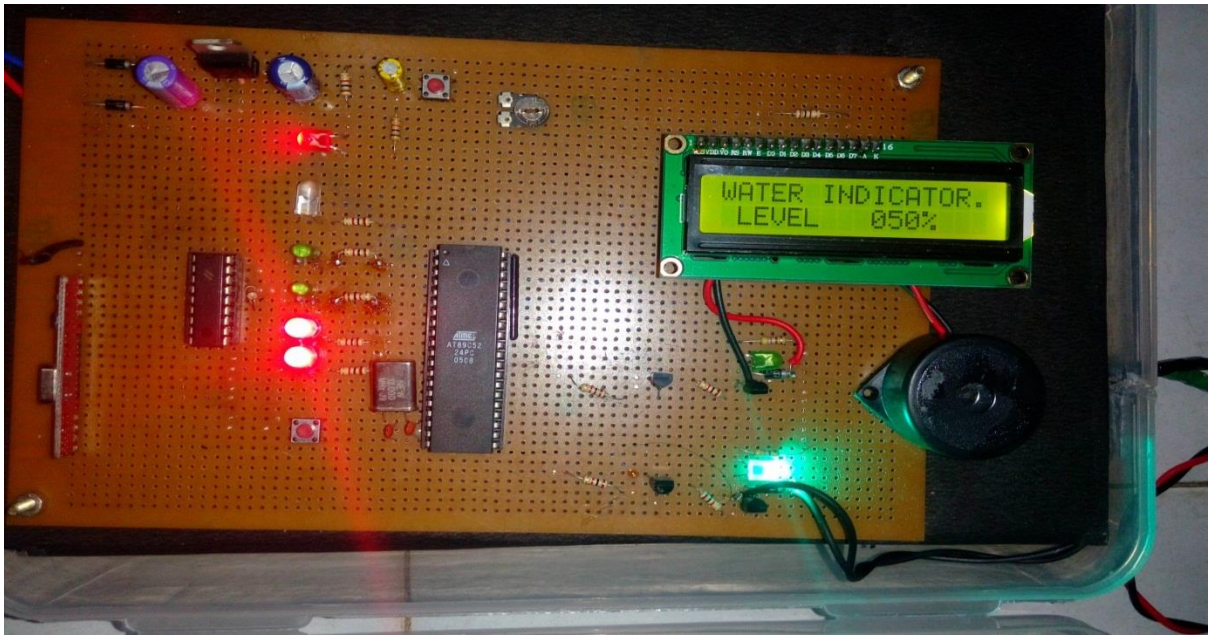


**Fig 4:** Level Indication of Half filled tank.

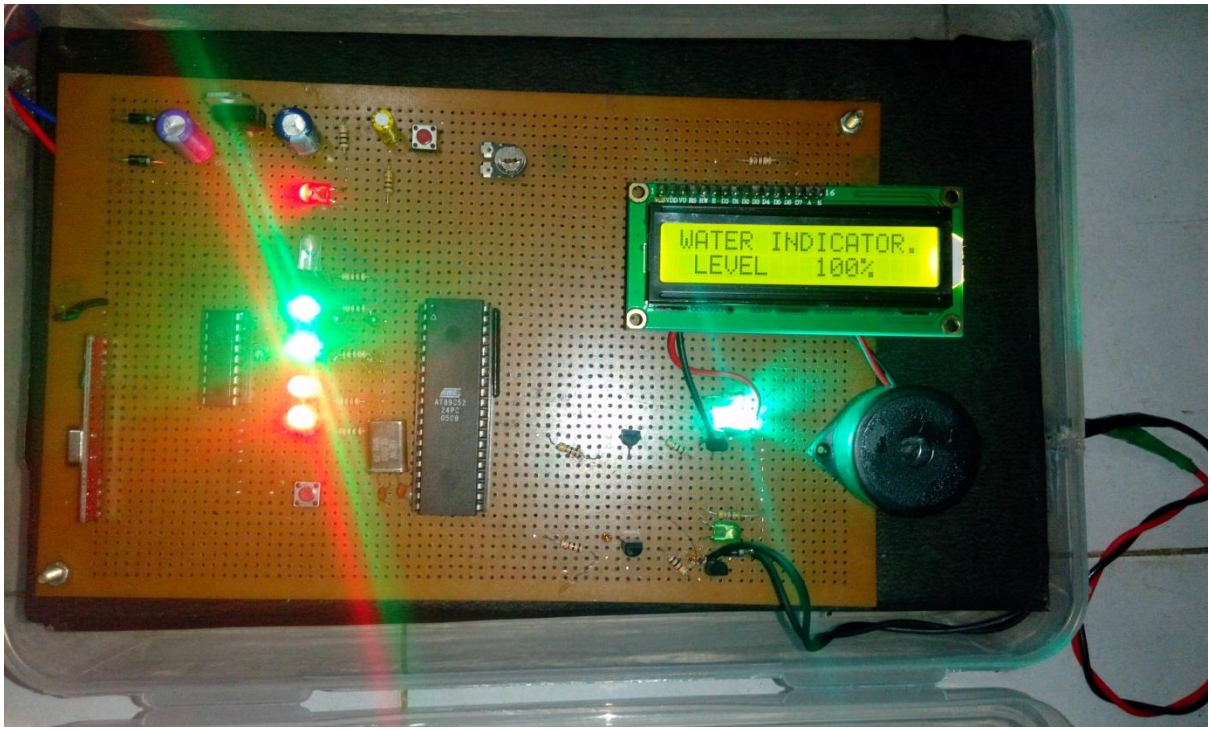


**Fig 5:** Level Indication of Full tank.

### 2.4 How to Operate Water Level Controller Circuit Using 8051 Microcontroller

Initially burn the program to the controller. Now give the connection as per the circuit design.
While giving the connections, make sure that there is no common connection. Place the 4 water level indicating wires into the small tank. Switch on the supply, now the motor will run automatically as there is water in the tank.
Now pour the water, when it reaches to 25% level then LCD displays 25% on LCD. For further levels, it will display 50% and 75% FULL on LCD. Still if you pour the water then LCD displays 100% motor turns OFF automatically when the tank is full. Switch OFF the motor supply and board supply.

## III. RESULTS

The experimental model was made according to the circuit diagram (Refer fig. 1 and 2) and the results were as expected. The subsystems of this project have been independently tested and are working. The first major test is the range test of the 433 MHz wireless link. Indoor and outdoor testing produced a range of about 50 meters . With this implemented system, it is possible to monitor the water level in an over-head tank, switch on the water pump when the tank is empty and switch off the same pump when the tank is full without any need for human intervention. By so doing, the incidence of water wastage is eliminated and abrupt cut-off of water supply is equally also eliminated.
As already highlighted in the previous sections, the microcontroller is the heart of this project work, as all the control signals pass through and are processed by the microcontroller. The LCD was interfaced to the microcontroller in order to display the status of the system as it operates. The result from the Proteus assembler simulation is as is seen in Fig.6.

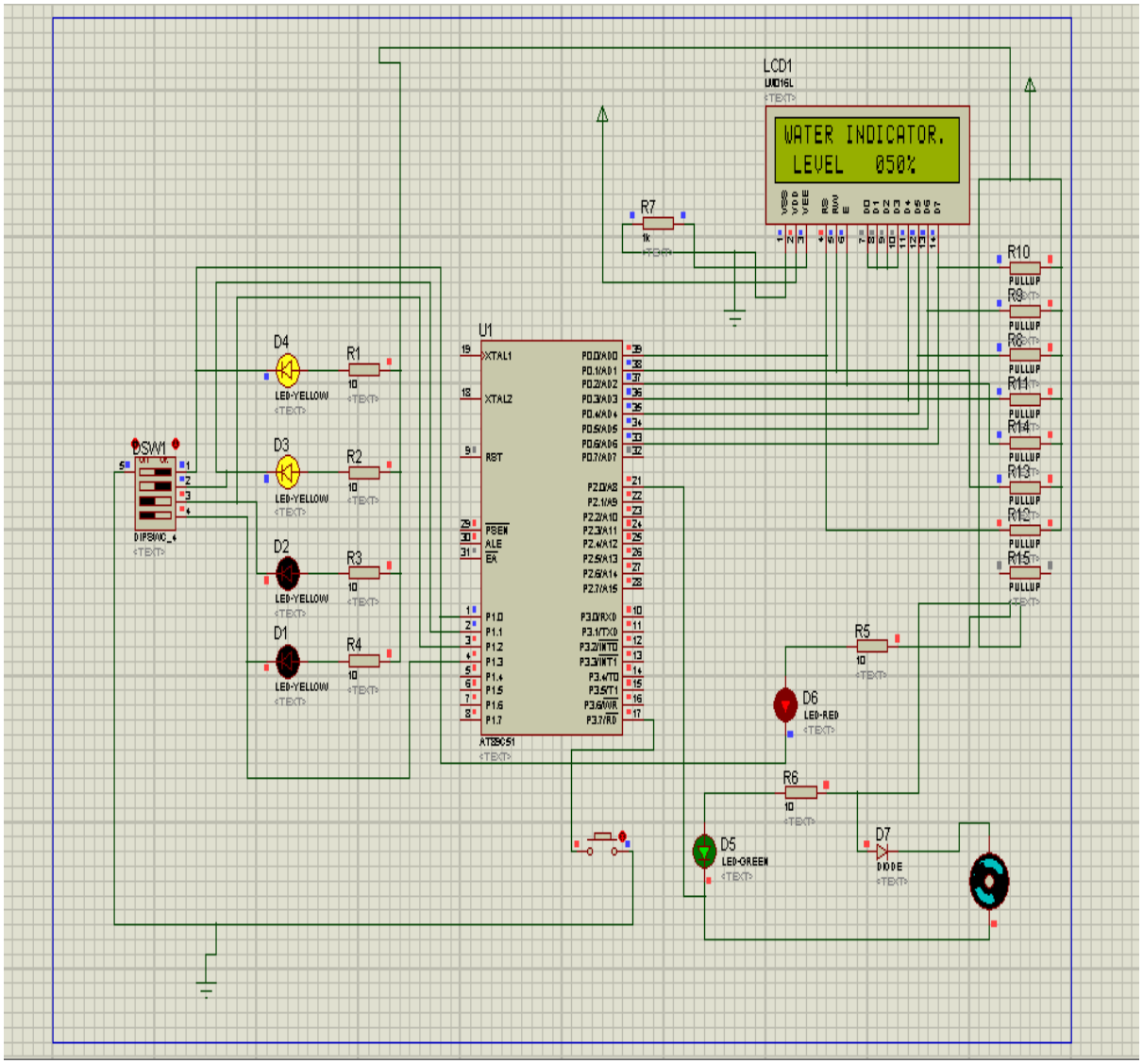


**Fig 6:** System Simulation Results

## IV. CONCLUSION

This system is very beneficial in rural as well as urban areas. It helps in the efficient utilization of available water sources. If used on a large scale, it can provide a major contribution in the conservation of water for us and the future generations.

In these days, when Earth's reserve of consumable water is decreasing every moment, every drop has its value. Water level controller is a simple yet effective way to prevent wastage of water. Its simplicity in design and low cost components make it an ideal piece of technology for the common man.

## V. FUTURE WORK

The water level controller designed in this project can be used to control water flow. However, there is no way of knowing whether the source of water, which in this case is the UGT, actually has water or not. If no water source is present, then the water pump would start running unnecessarily and overheat itself. This could be taken care by implementing another sensor. Also, the rate of water input must always be equal to or greater than the rate of water output. To make this happen we could use a speed regulator. If these issues are taken care of then a more efficient and reliable performance can be achieved.

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