WATER LEVEL CONTROLLER

Yash Sali[1], Aditya Holkar[2], Suraj Nagargoje[3], Harshavardhan Patil[4]
Mrs. Surekha Dixit[5]

Electrical Engineering, Vishwakarma Institute of Technology (India)

ABSTRACT

Water Level Controller will help in automatically controlling the water motor by sensing the water level in a tank. 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. Initially when the tank is empty, LCD will display the message LOW and motor runs automatically. When water level reaches to half level, now LCD displays HALF and still motor runs.When the tank is full, LCD displays FULL and motor automatically stops. Again, the motor runs when water level in the tank becomes LOW.

I. INTRODUCTION

This project is concerned with the use of Microcontroller for the water level controller. The heart of the Water Level Controller using 8051 Microcontroller project is the AT89C51 Microcontroller. The different pins of the microcontroller are responsible for the indication of LOW, HALF or FULL level of water. One port is connected to the collector of transistor for the input of current amd the other port is connected to the data pins of LCD and control pins. The LCD is programmed to display the levels of water in a tank. This explains the use of a programmable LCD as a indicator of water level as well as the relay connected to the LEDs which in turn causes the water motor to turn ON and OFF depending upon the level of water.

II. HEADINGS

III. IDENTATIONS AND EQUATIONS

The heart of the Water Level Controller using 8051 Microcontroller project is the AT89C51 Microcontroller. The water level probes are connected to the P0.0, P0.1 and P0.2 through the transistors (they are connected to the base of the transistors through corresponding current limiting resistors). P0.0 for LOW level, P0.1 for HALF Level and P0.2 for HIGH Level. The Collector terminals of the Transistors are connected to VCC and the Emitter terminals are connected to PORT0 terminals (P0.0, P0.1 and P0.2).PORT1 of the microcontroller is connected to the data pins of LCD and the control pins RS, RW and EN of the LCD Display are connected to the P3.6, GND and P3.7 respectively.
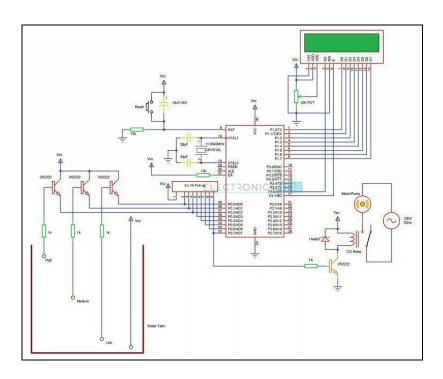
3.1 ALGORITHM

- First configure the controller pins P0.0, P0.1 and P0.2 as inputs and P0.7 as output.
- Now, initialize the LCD.
- Continuously check the water level input pins P0.0, P0.1 and P0.2.
- If all the pins are low, then display tank as "EMPTY" on the LCD and make P0.7 pin HIGH to run the motor automatically.
- If the level is low i.e. if P0.0 is HIGH, display the water level as "LOW" and continue to run the motor.
- A HIGH pulse on the pin P0.1 indicates that water has reached half level. So, display the same thing on LCD and run the motor normally.
- If P0.2 is HIGH, then the water level in the tank is FULL.
- Now, make the P0.7 pin as LOW to turn off the motor automatically.

3.2 CONFIGURATION

- Initially, write the program for Water Level Controller in Keil µVision IDE and generate the .hex file.
- Burn the program (.hex file) to the microcontroller using external programmer and Willar Software.
- Now give the connections as per the circuit diagram.
- While giving the connections, make sure that there is no common connection between AC and DC supplies (if you are using an AC Motor)
- Place the 4 water level indicating wires into the small tank (3 probes for three different levels and fourth one for common supply)
- Switch on the supply. Now, the motor will run automatically as there is no water in the tank. (It will turn on even if the water level is LOW).
- Now pour the water, when it reaches LOW level, then LCD displays LOW.
- For middle level, it will display as HALF on the LCD.
- Still if you pour the water, then the water level reaches full and the LCD displays FULL and also the motor is turned OFF automatically.
- Switch off the motor supply and board supply.

IV. FIGURES

V. CONCLUSION

This controller works on its own and there is hardly any need of a human interference in the working of the motor and indicator. This is more reliable project as there is no threat of any sort of defect or fault in the circuit as no sensors used and only wires are used based on the principle of conduction of electricity through water. Human effort is reduced as the system controls the motor automatically based on the water level. It is also a preferable alternative to the contact water level controller as there is no such threat of the touch not being sensed by the lid. Although this system will require regular maintenance for the motor and pipes, this is a reliable system. This system consumes less power. Simple and more reliable. Used in big buildings where the manual monitoring is difficult. Used in industries to control the liquid level automatically.

REFERENCE

[1] www.electronicshub.org

[2] How to use Keil 8051 C Compiler by Kim Hyoung tae.