

WATER LEVEL INDICATOR USING MICRO CONTROLLER

Mudit bajpai, Money saxena

B.tech, IMSEC Ghaziabad Uttar Pradesh, INDIA

B.tech, IMSEC Ghaziabad Uttar Pradesh, INDIA

Abstract -This paper elaborates the design of the water level indicator and controller using micro controller 8051. This can be used both for household and commercial purposes. We make use of 8051 micro controller. There is also a buzzer and a LCD in this project. LCD is used to show the water level in the tank or reservoir. We make use of port P0 for connecting levels of the tank while port P2 is used for connecting the LCD. Micro controller also controls the pump which is used to pump water to the tank. As the tank reaches the full mark the pump is switched off during auto mode while the pump is switched ON when tank reaches empty mark. We make use of 8051 micro controller as it is easily programmable and is quickly accessible as compare to other micro controller.

Key Words: Micro Controller, Buzzer, Lcd, Water, Indicator

1. INTRODUCTION

For the near future the water crisis is going to be the chief global risk. One drop of water wasted by us can mean the world for someone else. Hence we need to take initiative to conserve water and keep it safe for upcoming generation. For people across the world, although they have sufficient sources for water, they tend to take it for granted and waste it while storing it. This project not only helps to indicate the water level of the tank but also helps to switch of the pump when water reaches to full level in the tank. This design uses micro controller 8051, switches, pump, and LCD for display to water level indicator in the tank. There are various needs for water level indicator, some of them are - overflown problems, to prevent waste of energy, to prevent waste of water, to automatic switch off.

2. COMPONENTS

Main component of this project is micro controller. It is a modified Harvard architecture having 40 pins. The architecture provides many functions in a single chip. Following are the properties of the micro controller. 8-bit ALU and 8-bit accumulator, 8-bit register and 8-bit data bus. 16-bit address line. 128 bytes on chip memory. four register bank. It uses NMOS and CMOS technology. It also has 8-bit TMOD register. It works on the following mode; MODE 0 - 13-bit timer/counter mode. MODE 1 - 16-bit timer/counter mode. MODE 2 - 8-bit auto reload mode.

MODE 0 - 13-bit timer/counter mode. MODE 1 - 16-bit timer/counter mode. MODE 2 - 8-bit auto reload mode. MODE 3 - split timer /counter mode. It also consist of 16-bit special function register -PROGRAM COUNTER, DPTR REGISTER. Other components involved in this project are LCD, BUZZER, WIRES, CAPACITORS, RESISTORS, ETC.

3. PRINCIPLE AND OPERATION

The operation of this project is very simple. In this project "WATER LEVEL INDICATOR", there are three main condition.

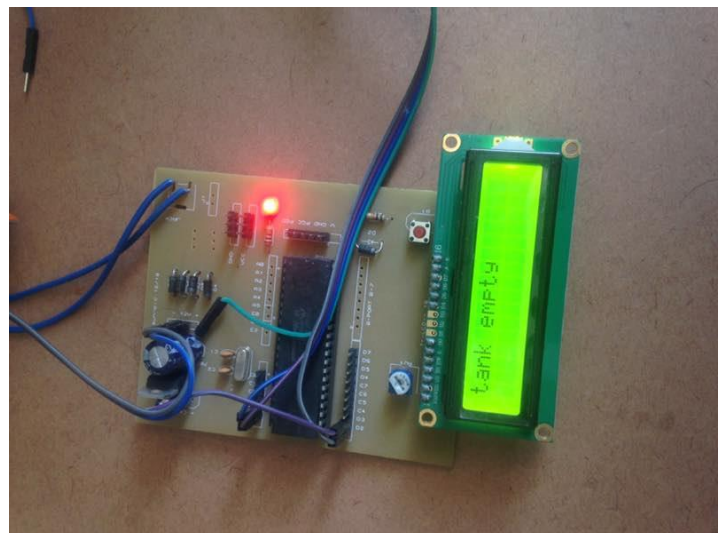
THE WATER TANK IS EMPTY.

THE WATER TANK IS HALF FULL.

THE WATER TANK IS FULL.

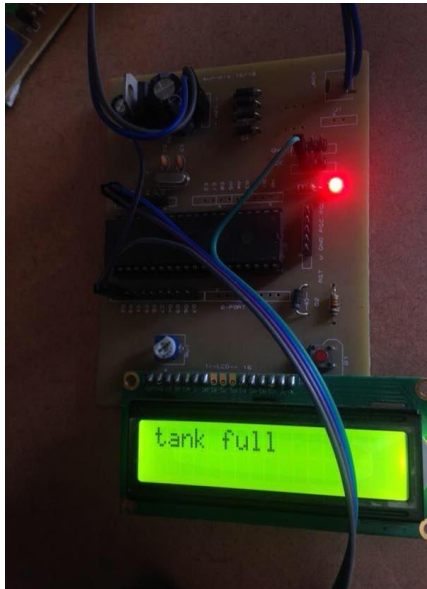
3.1 WATER TANK IS EMPTY

When the tank is empty there is no conductive path between the micro controller 8051 and the tank. So the sensor region will not have sufficient biasing voltage hence it remains in cut of region and output across its collector region will be V_c equal to 4.2v. As in this case the micro controller is used in active low region (which means it considers 0-2 volt for HIGH and 3-5 volt for LOW). Now the output of transistor is 4.2 volt hence will approximately be considered as LOW by micro controller. Therefore default value given to seven segment display is 0, hence understood as TANK EMPTY.



3.2 WATER TANK IS HALF FULL

When the water starts to flow, there is a conductive path between the sensing probe and the common probe and the corresponding transistor gets sufficiently biased. Now the outputs will be V_c (1.2v - 1.8v) . The micro con-



troller is programmed in such a way that it will show display in LCD as the path is established between the sensing and the common probe. Hence will show water tank is empty.

3.2 WATER TANK IS FULL

When water tank is full, the top level probe gets conductive path through water and the transistor whose output is given as input to micro controller . With this input the seven segment is used to represent that the tank is full

This will automatically switch off the motor and hence help us in preserving not only water but also help us save electricity.

4.CONCLUSIONS

This paper was intended in order to design a low cost , simple and effective water level indicator and controller. This project can not only be used for water level indicator but can effectively be used for other liquids such as oils and chemicals being in liquid form. As the complete system works automatically so it doesn't require an expert person to operate it nor is expensive. We have obviously encountered various limitations while going through but hopefully we will be able to overcome through future automation.It can be further be used in fuel levels indicators in vehicles as well as liquid level indicator in huge tanks used in factories and industries.

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