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WATER LEVEL DETECTION USING MICROCONTROLLER

8051

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Introduction

A Water Level Indicator may be defined as a system by which we can get the information of any water reservoir. Water level indicator system is quite useful to reduce the wastage of water from any reservoir, while filling such reservoir. This is an interesting and very useful project in our real life. By using this project circuit, we can detect and control the water level automatically in a overhead tank or a container. This system monitors the level of water in a tank and automatically switches ON the motor whenever the water 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.

In this system water sensing can be done by using a set of 4 wires which are placed at different levels in tank.

LITERATURE SURVEY

Year	Title	Description
2013	Design and Development of automatic water flow meter	<p>This research paper by Ria Sood, Manjit Kaur, Hemant Lenka emphasizes on the need of water level controller in irrigation in agriculture. It says that every crop requires require different amount of water and this can be done by using automatic water level controller which will also help in reducing wastage of water. Here they use a technique to measure flow of rate of water in irrigation pipelines.</p>
2014	Automatic Water Level Control System (International Journal of Science and Research (IJSR))	<p>This research paper by Asaad Ahmed Mohammedahmed Eltaieb , Zhang Jian Min involves designing and development of automatic water level control system had exposed to the better way of software and hardware architecture that blends together for the interfacing purposes.</p>

Year	Title	Description
2016	Automatic Water Level Controller with Short Messaging Service (SMS) Notification	<p>This research paper by Sanam Pudasaini, Anuj Pathak, Sukirti Dhakal, Milan Paudel presents a system of an automatic water level controller with SMS notification. SMS notification was added to automatic controller system so that water can be managed by user during load shedding</p>
2020	Echo based water level management system using 8051 microprocessor	<p>This paper proposes the non contact water management system using ultrasonic technology and microprocessor 8051. This water level controller can monitor and control water tanks up to 2m deep and the accuracy of measuring is as low as 0.1cm. Since no mechanical float switches or electrodes are used here, there will not be any mechanical wearing or corrosion and this makes the system highly reliable.</p>

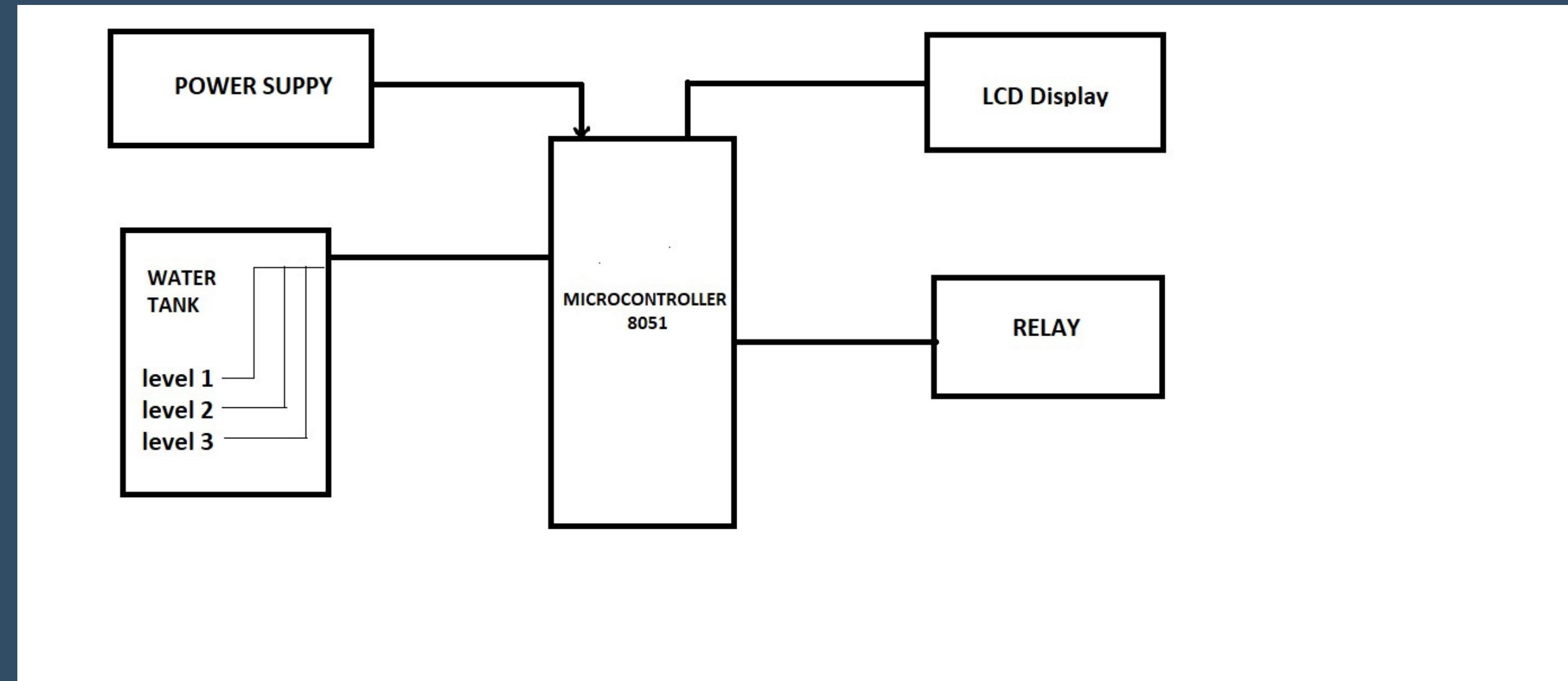
AIM

**The objective of this project is to notify the user
the amount of water that is present in the
overhead water tank and don't waste water.**

OBJECTIVES

- To create the most cost-effective and reliable water level controller using as less resources as possible.
- To study the controller model and observe its characteristics.
- To compare the controller with the conventional controllers available in market and find the advantages of the former over the latter.
- To suggest any ideas or improvements that can lead to future development of the controller.
- The control panel can also be programmed to automatically turn on a water pump once levels get too low and refill the water back to the adequate level.

BLOCK DIAGRAM



Components

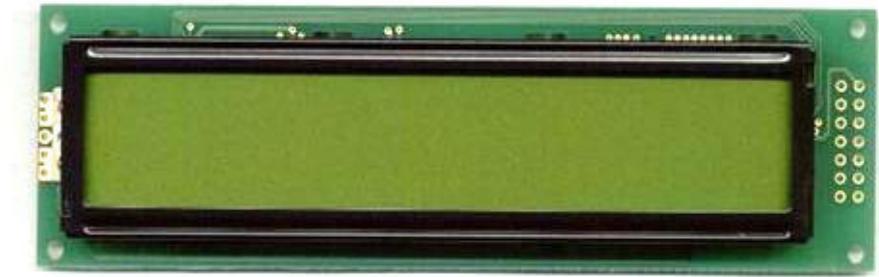
- At89c51 controller
- 16*2 LCD
- 5V Relay
- Bc547 (NPN) transistors
- 5Resistors (1K)
- 4Resistor 330 ohm
- Connecting wires
- Power supply



Transistor

A TRANSISTOR IS A SEMICONDUCTOR DEVICE COMMONLY USED TO AMPLIFY OR SWITCH ELECTRONIC SIGNALS. A TRANSISTOR IS MADE OF A SOLID PIECE OF SEMICONDUCTOR MATERIAL, WITH AT LEAST THREE TERMINALS FOR CONNECTION TO AN EXTERNAL CIRCUIT. THIS IS A NPN TRANSISTOR. TRANSISTOR(BC548)

LCD



LCD (LIQUID CRYSTAL DISPLAY) SCREEN IS AN ELECTRONIC DISPLAY MODULE AND FIND A WIDE RANGE OF APPLICATIONS. A 16X2 LCD DISPLAY IS VERY BASIC MODULE AND IS VERY COMMONLY USED IN VARIOUS DEVICES AND CIRCUITS. THE REASONS BEING: LCDS ARE ECONOMICAL; EASILY PROGRAMMABLE; HAVE NO LIMITATION OF DISPLAYING SPECIAL & EVEN CUSTOM CHARACTERS



RESISTOR

THE RESISTOR IS AN ELECTRICAL DEVICE WHOSE PRIMARY FUNCTION IS TO INTRODUCE RESISTANCE TO THE FLOW OF ELECTRIC CURRENT. THE MAGNITUDE OF OPPOSITION TO THE FLOW OF CURRENT IS CALLED THE RESISTANCE OF THE RESISTOR.

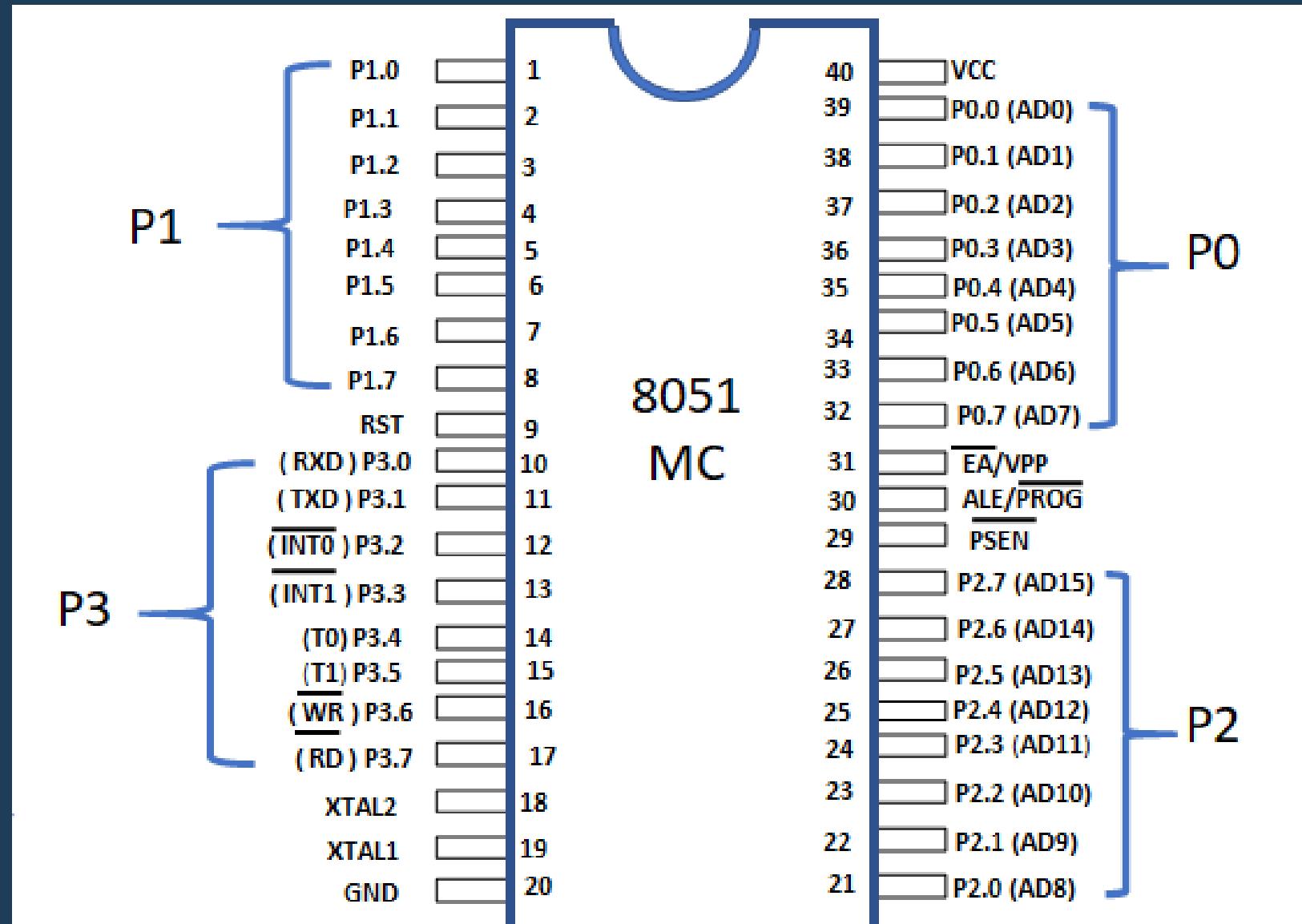
RELAY

A RELAY IS AN ELECTRICALLY OPERATED SWITCH. IT CONSISTS OF A SET OF INPUT TERMINALS FOR A SINGLE OR MULTIPLE CONTROL SIGNALS, AND A SET OF OPERATING CONTACT TERMINALS. THE SWITCH MAY HAVE ANY NUMBER OF CONTACTS IN MULTIPLE CONTACT FORMS, SUCH AS MAKE CONTACTS, BREAK CONTACTS, OR COMBINATIONS THEREOF.



AT89C51:

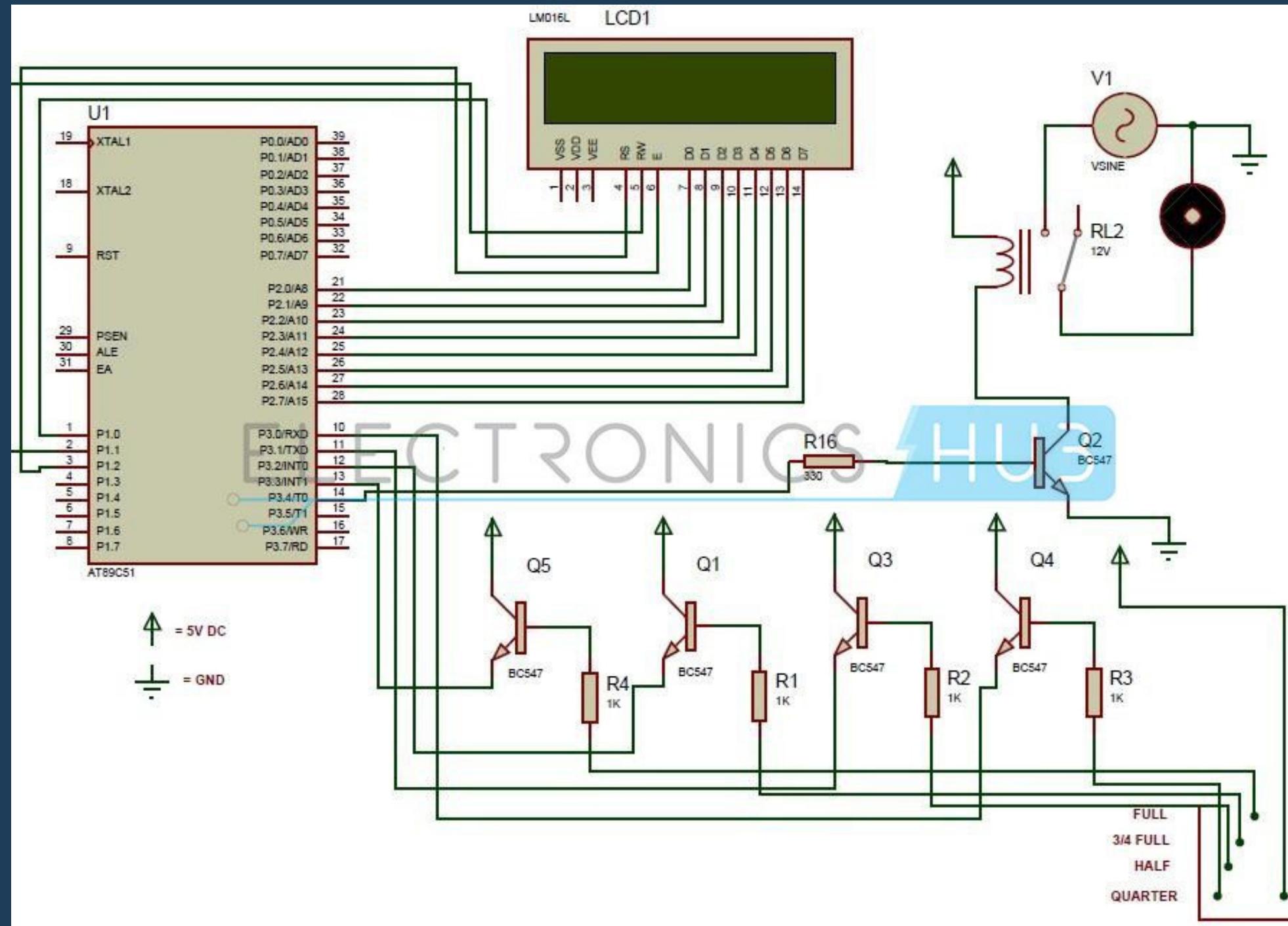
AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 family. ATTEL 89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times. In 40 pin AT89C51, there are four ports designated as P1, P2, P3 and P0. All these ports are 8-bit bi-directional ports, i.e., they can be used as both input and output ports.



WORKING PRINCIPLE

- 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 transistors.
- Port P2 connected to the data pins 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 EMPTY and motor runs automatically.
- When water level reaches to quarter level, now LCD displays QUARTER and still motor runs.
- For further levels, LCD displays the messages HALF and FULL. When tank is full, LCD displays FULL and motor automatically stops.
- Again motor runs when tank is empty.

CIRCUIT DIAGRAM



APPLICATIONS

1

Automatic Water level Controller can be used in hotels, factories, homes ,apartments, commercial complexes, drainage ,etc.

2

Fuel level indicator in vehicles.

3

Liquid level indicator in huge containers in the companies.

4

Used in big buildings where the manual monitoring is difficult. also Used in industries to control the liquid level automatically.



ADVANTAGES

- Human effort is reduced as the system controls the motor automatically based on the water level.
- Simple and Reliable.
- This system consumes less power.
- Simple and more reliable.
- Save money by using less electricity and water
- Minimal maintenance

Conclusion

In this Project water level indicator using microcontroller 8051 it proposed The water level Indicator employs a simple mechanism to detect and indicate the water level in an over head tank or any other water container. The sensing is done by using a set of four probes which are placed at four different levels. We can conclude that 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. 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.

Thank you !

