



REVIEW ARTICLE

WATER LEVEL INDICATOR USING TRANSISTOR BC547

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ABSTRACT

Water level indicator is widely used in many industries and houses. People generally worry about the wastage of water, when the switch ON the motor and forget to OFF them. An Water Level Indicator may be defined as a system by which we can get the information of any water reservoir. Water level indicator system are quite useful to reduce the wastage of water from any reservoir, while filling such reservoir. But for domestic purpose we cannot go for the instruments which use radar or ultrasonic principle that costs high. Water tank overflow is a common problem which leads to the wastage of water. In this project I am using the transistor based water level indicator circuit is very useful to indicate the water levels in a tank. Whenever tank gets filled, we get alerts on particular levels. The LEDs is generally used for indicate the water levels. If the water level is full, then the circuits beeps through the buzzer notifying that the water level is full.

INTRODUCTION

Water level indicator used to express the level of water in water tank and boiler etc. different types of water level indicator are available in market like mechanical and electronics. They can apply as their order & condition to the industries and domestic zones. This circuit not only indicates the amount of water present in the tank but also gives an indication when the tank is full. As the water continues to fill the tank, the LEDs light up gradually.

NEED OF WATER LEVEL INDICATOR

- Overflow problems.
- To prevent wastage of energy.
- To prevent wastage of water
- Observation.
- Attention.
- Automatic switch off.

There are 3 LED available to indicate the different level of water in water glass. This circuit expresses the level through the lighting of LED. This kind of circuit is not used more because of its silent features. Generally we used buzzer type circuit. The buzzer type circuit we also shown in this project with the image there are some few changes in buzzer circuit in compare of above circuit. Right now in the market different type of circuit are available with excellent quality.

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Here our aim to demonstrate the simple model which you can make at your home and for your science far.

USE OF WATER LEVEL INDICATOR

Water level indicator used as different area as below.

- Home
- Building
- Textile market
- Power plant industries
- Solar heater
- Water distributor plant
- Stone and marble industries
- Food industries
- Small industries

ACTUAL DESIGN OF WATER LEVEL INDICATOR

According to the figure are shown this is actual working circuit of water level indicator here you can see three wire are used to indicate the different water level of glass through the different colour LED. At the other side battery connection are shown with the positive and negative sign. And also three transistors are shown in figure which used to high the signal.

NEED FOR WATER LEVEL INDICATOR

- Over flow problems
- To prevent waste of energy

- To prevent waste of water
- Attention

MATERIALS USED

- Transistor bc547
- Light emitting
- Buzzer
- Resistor(330 ohm)
- Bread board
- Connecting wires
- Water tank

TRANSISTOR BC547

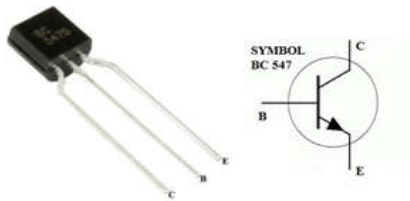


Figure (A) Transistor BC547

A BC547 transistor is a negative-positive-negative (NPN) transistor that is used for many purposes. Together with other electronic components, such as resistors, coils, and capacitors, it can be used as the active component for switches and amplifiers. Like all other NPN transistors, this type has an emitter terminal, a base or control terminal, and a collector terminal. In a typical configuration, the current flowing from the base to the emitter controls the collector current. It is a medium gain, general-purpose transistor purposely for signal generation, audio amplifiers applications and low power consumptions. Usually the frequency is about 250MHz and has a gain of 330. The dc gain and frequency transmission ensures wide usage.

Other features include

- AF amplification
- Oscillation
- Switching capabilities
- TTL logic circuits

LIGHTEMITTING DIODE (LED)

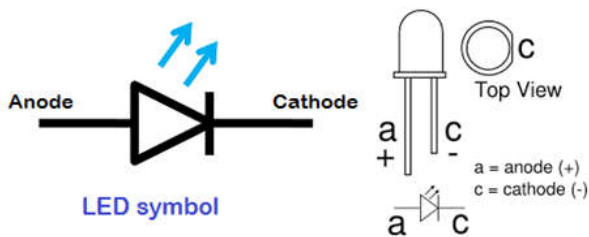


Figure (B) LED

A light-emitting diode (LED) is a two-lead semiconductor device that emits visible light when an electric current passes through it.

The light is not particularly bright, but in most LEDs it is monochromatic, occurring at a single wavelength. The output form an LED can range from red (at a wavelength of approximately 700 nanometers) to blue-violet (about 400 nanometers). Some LEDs emit infrared (IR) energy (830 nanometers or longer); such a device is known as an infrared-emitting diode (IRED). An LED or IRED consists of two elements of processed material called p-type semiconductors and N-type semiconductors. These two elements are placed in direct contact, forming a region called the P-N junction.

FEATURES

- Low power requirement
- High efficiency
- Long life
- Fibre optics data transmission
- Remote control

BUZZER



Figure(C) Buzzer

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or Piezo electronic. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user such as a mouse click or keystroke. A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise). Often these units were anchored to a wall or ceiling and used the ceiling or wall as a sounding board. Another implementation with some AC-connected devices was to implement a circuit to make the AC current into a noise loud enough to drive a loudspeaker and hook this circuit up to a cheap 8-ohm speaker. Nowadays, it is more popular to use a ceramic-based piezoelectric sounder like a Sonalert which makes a high-pitched tone.

RESISTOR

A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. Resistors can also be used to provide a specific voltage for an active device such as a transistor. Resistors can also be used to provide a specific voltage for an active device such as a transistor. All

other factors being equal, in a direct-current (DC) circuit, the current through a resistor is inversely proportional to its resistance, and directly proportional to the voltage across it. This is the well-known Ohm's Law. In alternating-current (AC) circuits, this rule also applies as long as the resistor does not contain inductance or capacitance. Resistors can be fabricated in a variety of ways. The most common type in electronic devices and systems is the carbon-composition resistor. Fine granulated carbon (graphite) is mixed with clay and hardened. The resistance depends on the proportion of carbon to clay; the higher this ratio, the lower the resistance.



Figure [D] Resistor

BREAD BOARD

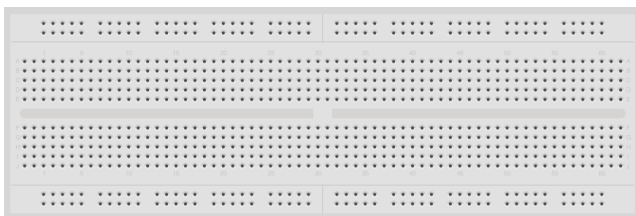


Figure [E] Bread board

A breadboard is a widely used tool to design and test circuit. You do not need to solder wires and components to make a circuit while using a bread board. It is easier to mount components & reuse them. Since, components are not soldered you can change your circuit design at any point without any hassle. It consist of an array of conductive metal clips encased in a box made of white ABS plastic, where each clip is insulated with another clips. There are a number of holes on the plastic box, arranged in a particular fashion. A typical bread board layout consists of two types of region also called strips. Bus strips and socket strips. Bus strips are usually used to provide power supply to the circuit. It consists of two columns, one for power voltage and other for ground.

BREADBOARD TIPSING

It is important to breadboard a circuit neatly and systematically, so that one can debug it and get it running easily and quickly. It also helps when someone else needs to understand and inspect the circuit. Here are some tips:

- Always use the side-lines for power supply connections. Power the chips from the side-lines and not directly from the power supply.
- Use black wires for ground connections (0V), and red for other power connections.
- Keep the jumper wires on the board flat, so that the board does not look cluttered.

- Route jumper wires around the chips and not over the chips. This makes changing the chips when needed easier.
- You could trim the legs of components like resistors, transistors and LEDs, so that they fit in snugly and do not get pulled out by accident.

BATTERY



Figure [F] (9v) Battery

A battery is an electro chemical cell (or enclosed and protected material) that can be charged electrically to provide a static potential for power or released electrical charge when needed. A battery generally consists of an anode, cathode and an electrolyte. Common types of commercial batteries and some of their characteristics and advantages are summarized in the following table. Battery types not shown include the zinc-air, flooded lead acid, and alkaline batteries.

WATER GLASS



Figure [G] (9v) Battery

This is water glass is used as little water tank. As shown in figure there are 4 different colours wire inserted in the glass. First Black wire used for the ground level to complete the circuit and other there are used for the different level like low, medium and high. This level can be decided as your requirement.

JUMPER WIRE

Jumper wire is copper laminated aluminium wire is used to join the component like transistor, resister, capacitor, and etc.

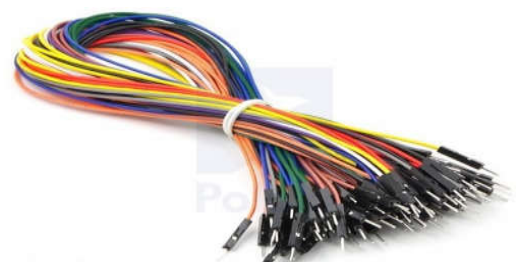


Figure [H] Jumper wire

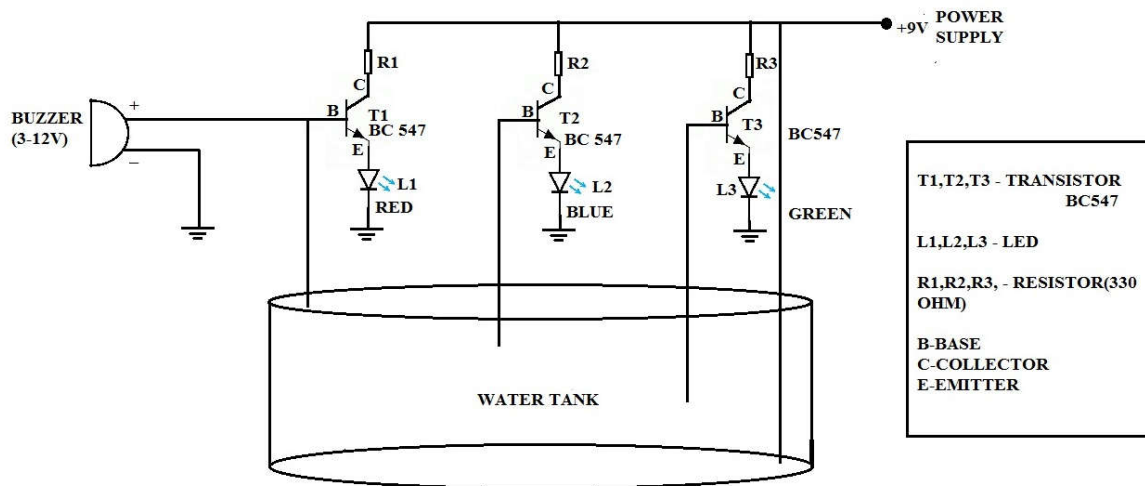
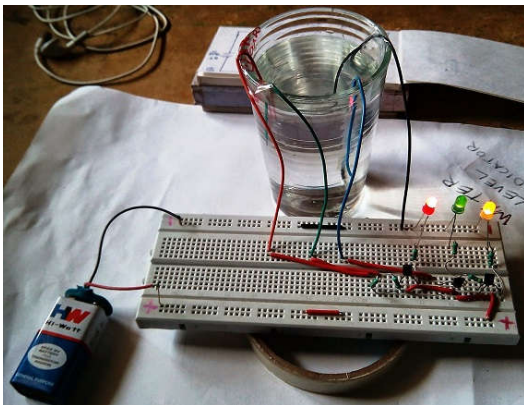


Figure 1. Circuit diagram

CIRCUIT DIAGRAM AND WORKING

After the connections are made as per the circuit diagram the circuit is then excited by 9V battery. The positive terminal of the battery is given to bottom of the measuring tank measuring tank that generates the flow of ions in the liquid present in tank. The base of the three transistors makes contact with the water at three different levels such as low, medium and high. When the base terminal makes the contact with the water the current starts to flow from base to emitter terminal. This current flow in the emitter terminal makes the LED to glow at different levels. If the water level is full, then the circuits beepthrough the buzzer notifying that the water level is full.

OUTPUT



Conclusion

Thus from this project I conclude that this is one of the most simplest model used as water level indicator which can be made at your home with very less cost. This setup consumes only 9V therefore it does not produce an electric shock when we touch the water in the measuring tank.

ADVANTAGES

- Easy installation.
- Low maintenance.

- Compact elegant design.
- Avoid seepage of roofs and walls due to overflowing tanks.
- Consume very little energy, ideal for continuous operation.

APPLICATIONS

- Science fair
- Home
- Technical college
- Hotels
- Drainage
- Industry or factory
- Role mode of water level indicator
- Fuel level indicate in vehicle

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