Ahsanullah University Of Science & Technology

Department of Electrical and Electronic Engineering

Project Report

Course No : EEE 2211

Course Title : Measurement and Instrumentation

Project Name : **Automatic Plant Irrigation System**

Submitted by-

Md. Moshiur Rahman (12-01-05-027)

Adnan Ibne Sayeed (12-01-05-031)

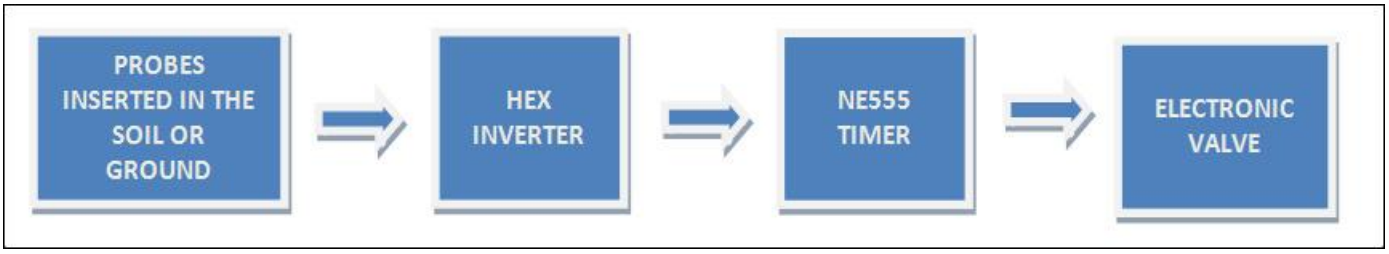
Mohammad Farhan (12-01-05-015)

S. J. Hamim (12-01-05-050)

Introduction:

Our project is mainly based on watering plants automatically without any human interference. We may call it as Automatic Plant Irrigation System. We know that people do not pour the water on to the plants in their gardens when they go to vacation or often forget to water plants. As a result, there is a chance of getting the plants being damaged. This project is an excellent solution for such kind of problems.

Block Diagram of Automatic Plant Irrigation System:



Instruments:

- Hex Inverter 7404
- Capacitor (47u, 0.01u, 100u, 10u (16V))
- Resistor (4.7k, 8.2k, 1000k, 27k, 100, 10k, 680, 100k)
- Transistors (SK100, BC547, BC548).
- Diode (1N4148, 1N4007)
- Relay (6V)
- NE 555 timer IC
- Voltage Regulator Circuit (10V)
- Copper Wire
- DC motor
- Adapter (12V).
- Water tank.
- Zener Diode (3.3V)
- Casing

- Breadboard
- LED

Circuit Diagram:

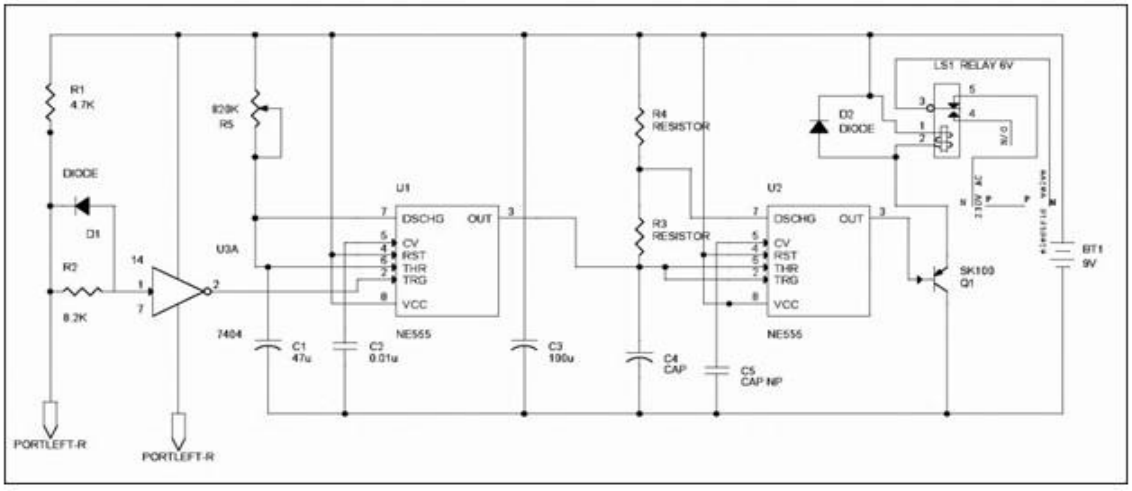


Fig: Automatic Plant Irrigation.

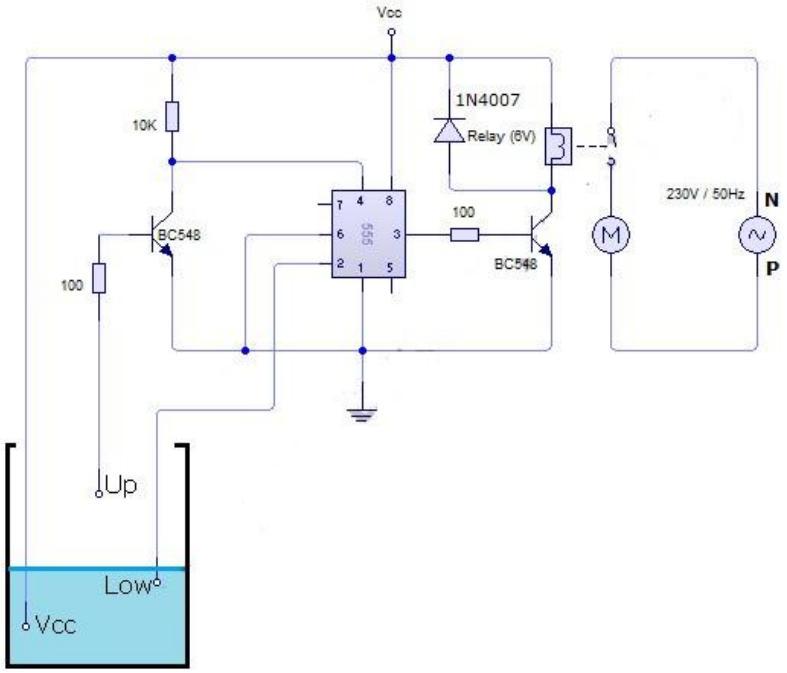


Fig: Water Level Indicator.

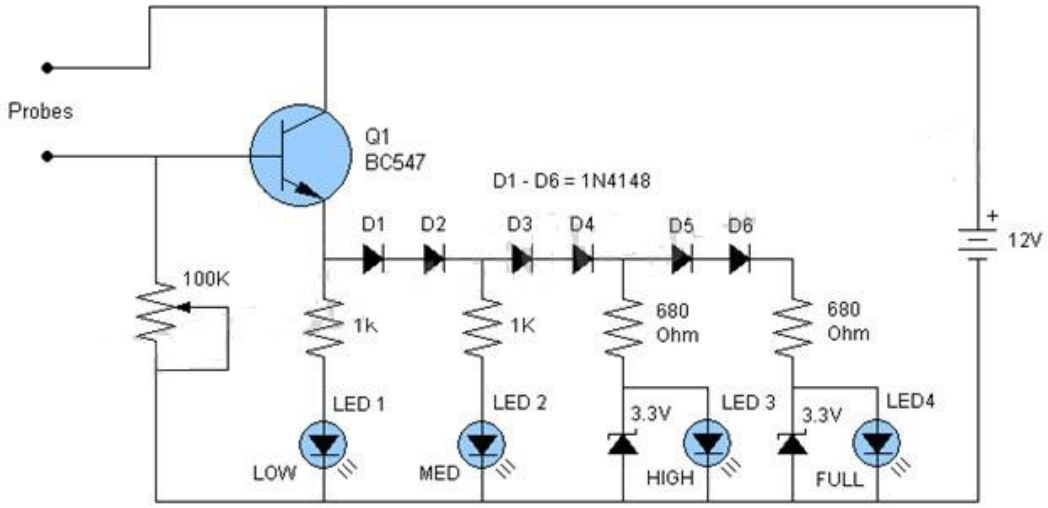


Fig: Moisture Level Indicator Using LED.

Working principle:

- We use the basic concept in this project. Soil has high resistance when it is dry and has very low resistance when it is wet.
- By using this concept we will make the system work. We insert two probes in the soil in such a way that that they will conduct when the soil is wet and they will not conduct when the soil is dry. So, when the probes do not conduct, system will automatically detect this condition with the help of HEX inverter which will become high when the input is low.
- HEX inverter will trigger the NE555 Timer and this NE555 timer will trigger another NE555 which is connected to the output of first NE555. Now the second NE555 which is configured as astable multivibrator will help to switch on the Electric valve and as result, it will allow the water to flow to the soil.
- When the water wet the soil, probes will again conduct and make the output of 7404 low which will make the first NE555 to low and also drive remaining circuit to low. So, automatically it will switch off the valve.
- We also used a water level indicator and a moisture level indicator which will indicate the water level on the tank, when the water level is low it will start a dc motor and when the water level is high it will switch off the motor. And the moisture level indicator will work as a LED meter which will indicate the moisture level from low to full.

Troubleshooting:

1. After completing the circuit the first problem we faced that there was no conductivity in the water so the probes cannot detect the moisture. So we use some salt in the water and increased the supply voltage.

2. Battery should be continuously monitored from power outage. If the supply voltage is less than or more than 10v the circuit will not work. We simply used a 10v dc adaptor to ensure the required supply.

3. The LED must be of the same voltage.

4. We used the NE555 timer both as monostable and astable mode. So it is obvious to make sure that the trigger pin is getting the required input for the proper output.

5. Although the circuit has been collected, there has been too much error. For this reason the above mentioned circuit didn't worked properly. So we modified the circuit to work.

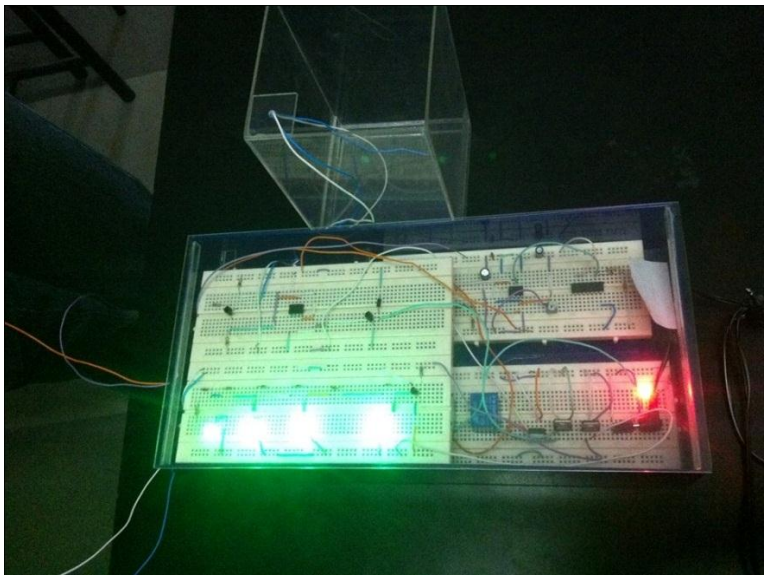
Applications:

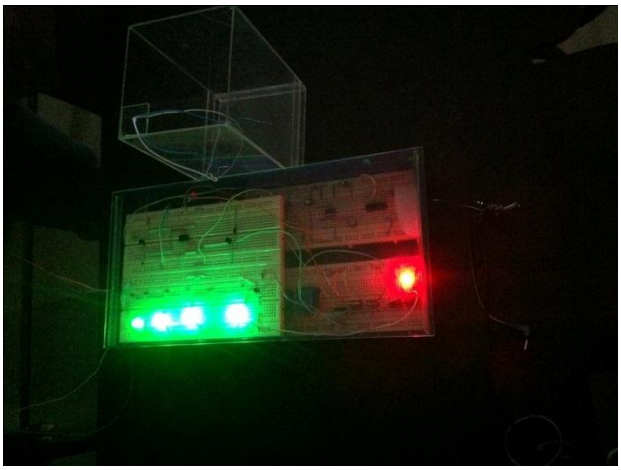
1. We can use this project to water our plants automatically without any human interference.

2. It can also be used as a water level and moisture level indicator.

3. It can also be used in the cultivation of field crops.

Project Image:






Future Work:

We want to make this project more easy using microcrontroller.

Conclusion:

Mainly we selected this project for our city dwellers. Living in this big city people still can't forget their root. Even though they are busy, they want to plant tress in small pots or even making a garden in their roof. To make their work easy this project can be handy. We can't be successful without the help of our honourable teacher Mr. Hasib Md. Abid Bin Farid.

Reference:

- www.electronicshub.com
- www.projecthub.com

THE END