**AUTOMATIC WATER LEVEL INDICATOR AND CONTROLLER** - by Anushi Chauhan

**Table of Content**

1. Abstract
2. Requirements
   1. High Level Requirement
   2. Low Level Requirement
3. SWOT Analysis
4. Block Diagram
5. Components
6. Applications
7. **Abstract**

The amount of drinking water available is limited and the water crisis in many regions is reaching alarming proportions. Hence, it is important to preserve water. A lot of water getting wasted is witnessed in households due to overflow in tanks.

Automatic Water Level Controller can provide a solution to this problem by indicating the water level in the tank and controlling the functioning of pump according to it. The level of water will work as signals to ON and OFF the switch of pump. When the water level rises up a certain level the sensors will sense and send the signal to turn OFF the pump.

1. **Requirements**
   1. High Level Requirements

|  |  |
| --- | --- |
| ID | High Level Requirement |
| HLR1 | Ultrasonic sensor should sense the water level in tank |
| HLR2 | LED should glow RED/GREEN indicating actions |
| HLR3 | Servo motor should be ON/OFF at desired level |
| HLR4 | Voltmeter should give accurate voltage rating |

* 1. **Low Level Requirements**

|  |  |  |
| --- | --- | --- |
| ID | Low Level Requirement | HLR ID |
| LLR1 | LED should glow RED when sensor detects water above desired level | HLR2 |
| LLR2 | LED should glow GREEN when sensor detects water below desired level | HLR2 |
| LLR3 | Servo motor should be OFF when signal is GREEN | HLR3 |
| LLR4 | Servo motor should be ON when signal is RED | HLR3 |
| LLR5 | Potentiometer should regulate the voltage properly | HLR4 |

1. **Swot Analysis**

|  |  |
| --- | --- |
| Strengths   * Easy to install. * Low maintenance. * Economical. * Highly reliable | Weaknesses   * No built-in function to detect source of failure. * Shows poor durability. |
| Opportunities   * Balanced allocation of water resources. | Threats   * Failure in circuit will affect water supply. * Repair parts are not available everywhere. |

1. **Block Diagram**

Switch

LED: GREEN

Ultrasonic Sensor

Close Valve

Arduino

Servo Motor

Voltmeter

Open Valve

LED: RED

Potentiometer

1. **Components**

**Ultrasonic Sensor (HC-SR01):** To determine the distance to the water, it transmits a sound pulse that reflects from the surface of the water and measures the time it takes for the echo to return. It is used as input valves to automatically open and close the water gate.

**Potentiometer:** The mechanical system of sensor converts linearly the value of potentiometer resistance to the water level variation.

**Servo Motor:** It converts the control signal of the controller into the angular velocity of the motor output shaft.

**Main Switch:** It detects the level of water in tank and based on that it will open or close the circuit used to pump out water inn tank.

**LED:** It is used as an indicator. When the valve of motor is open it will glow RED when water is less and GREEN when water is at expected level.

**Arduino:** It reads the voltage drop across each pull down resistor for sensing the level of water in tank.

**Voltmeter:** It is used to measure the potential difference between two points in a circuit.

1. **Applications**

* It can be used for irrigation purposes.
* It can be used in households.
* It can be used in factories and commercial complexes.
* It can be used in pools.
* It can be used in stream level monitoring.