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RESEARCH ARTICLE OPEN ACCESS

Water Level Monitoring Sensor

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ABSTRACT
Water tank overflow is a common problem which leads tothewastageofwater.Thoughtherearemanysolutions to it like ball valves which automatically stop the water flow once the tank gets full and transistor based which sends low electricity into water. But to monitor the live water level is not possible, so here is a mechanism that will detect the water level and will send the water percentage inside the tank tocloud.
This water level indicator with IOT is very useful to live monitorthewaterlevelsinatank.Thismechanismdon't need of passing of electricity into water tank, a floater is used to measure the water level in the tank. This Water Level Indicator Sensor is a simple low cost mechanism which is connected to Internet and the user can live monitor the water inLAN/WAN.
Keywords: Most reliable, Water Level Indicator, IOT, ESP8266, innovation.

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I. 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. Water is most essential thing on earth .Safe drinking water is essential to human and other life forms eventhoughitprovidesnocaloriesororganicnutrients. The total amount of water available on Earth has beenestimated at 1.4 billion cubic kilometers, enough to cover the planet with a layer of about 3 km. About 95% of the Earth's water is in the oceans, which is unfit for humanconsumption.
About 4% is locked in the polar ice caps, and the rest 1% constitutes all fresh water found in rivers, streams andlakes which is suitable for our consumption. A study estimated that a person in India consumes an average of 135 liters per day.Thisconsumptionwouldriseby40%bytheyear2025.
Thissignifiestheneedtopreserveourfreshwaterresources.

After assembling the system, what remains is to observe its operation and efficiency. This can be done by breaking down the activity of the controller from the detection of water to the working of the pump. We go over the responses obtained when water reaches the sensors and the logic employed behind it. We also try to justify how a system as simple as ours can compete with those available commercially.

SOFTWARE REQUIREMENTS:
Operatingsystem : Windows
CodingLanguage : C++
Server : Adafruit-IO*[1]*
Tool : Arduino IDE
Protocol : MQTT*[2]*

HARDWARE REQUIREMENTS:

- ***ESP8266****[3]* is an Open-source, Interactive, Programmable, Low cost, Simple, Smart, WI-FI enabled. It Contains firmware which runs on the Wi-Fi SoC from EspressifSystems.

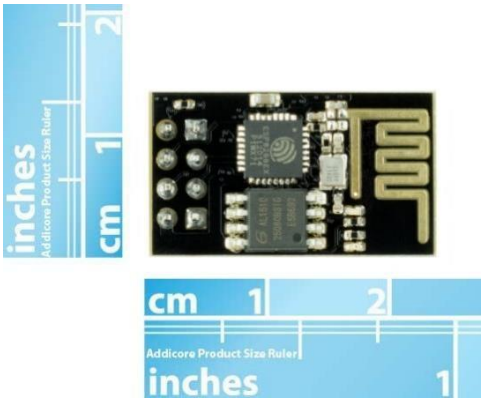

Fig 1: ESP8266 Wi-Fi module

- ***TTL****[4] is a* PL2303HX USB to TTL Serial UART Converter. The ESP8266 is no TTL! It uses 3.3V for power & for control so we can't just plug it to the USB to Serial 5V, it may burst

the ESP!. The board may suck more power than the USB converter can supply so you just can't rely on powering it from your USB toserial.

Fig 2: Ftdiusb to ttl cable

- ***Potentiometer** [5] / **Hall sensor:***

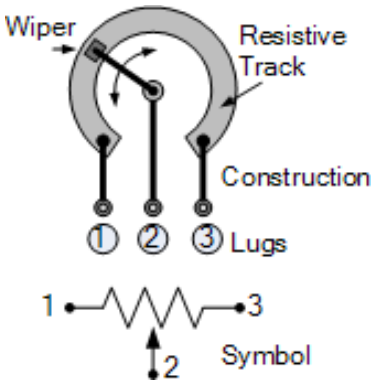

Fig 3: Potentiometer

- ***Floater andString***
- ***5vdc power supply /batteries***
- ***Spiral-Spring***
- ***Gears***

ADVANTAGES

- Inexpensive
- Can be used in any type of water storages (Tanks, Dams, Channels, Reservoirs ...Etc.)
- No need sending Voltage intowater
- Can upload data to Cloud, we can able to perform statistical operations on dailydata
- We can monitor water level with accurately with 4%-8%tolerance
- Accurate than the previousapproach
- Can be able to trigger the pump motor powerswitch.
- Can easily connected to any wireless module (wifi , GSM, Radio frequencymodule)

DISADVANTAGE

- Mustneedaninternetnetworktologdataintocloud

MARKET POTENTIAL

MarketPotentialofthiswaterlevelindicatorisveryhighfor followingreason.

- Simple circuit: This water level indicator consists with a simple circuit. It is so simple to install and it's so much easy touse.
- Low cost the equipment's required for this circuit are readily available in the market and of very low value.
- Low voltage consumption the circuit does not need any AC auxiliary supply, it operates on DC voltage source (3.3 V DC). Thus it is a very low consumptiondevice.

Circuit Diagram:

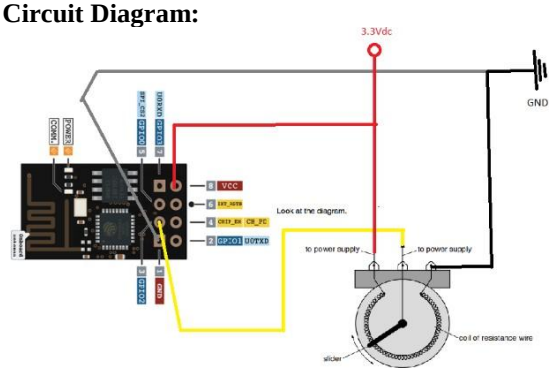

Fig 3: Sensor Circuit

Working Principle

Whenthewaterstaredfillingtotheoverheadwatertankthen the floater on the water surface will floats up and wounded tothespiralpotentiometer,andthreewiresofpotentiometer (Vcc,GND,Signal) were connected to an ADC/microcontroller to read the potentiometer analog reading.

Applications

Water level Indicator can be used in Reservoirs, Channels, Hotels, Factories, Homes, Apartments, Commercial complexes, Drainage, etc. It can be fixed for single phase motor, three phase motors, and fuel level indicator in vehicles. Liquid level indicator in the huge containers on their tank walls.

Future Work

In future, we can upgrade this project with additional smart IOT device which can automatically stop the power supply of the driving pump or motor. As a result the future circuit is not very cheaper the present one, but we try our best to

- Make itsimple,
- Easy touse,
- Easy toinstall,
- To make Available forall,
- Try to smaller than the presentone.

II. CONCLUSION

The water level Indicator employs a simple mechanism to detect and indicate the water

level in an overhead tank or any other water container. The sensing is done by using a floaterattachedtoPotentiometerusingastringwith/without gears (to maintain thetorque).

If used on a large scale, it can provide a major contribution in the conservation of water for us and the future generations. In these days, when the Earth's reserve of consumable water is decreasing every moment, every drop hasitsvalue.Waterlevelcontrollerisasimpleyeteffective waytopreventwastageofwater.Itssimplicityindesign and low cost components make it an ideal piece of technology for the commonman.

REFERENCES

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[5]. https://en.wikipedia.org/wiki/Potentiometer

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