Smart Water Level Management System Using Arduino

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Abstract

Nowadays all communications are done using the internet; this concept is called the Internet of things (IoT). Things in IoT can be anything or everything that we use in our daily lives. And in this project, the thing & quota; is a water tank. So why water tanks? Basically water level in the tank gets reduced and it needs to be filled again before the tank gets completely empty. In the process of filling the water again we usually forget to close the valve of the pump, due to which the water can be overflown and get wasted. This is the reason we proposed the smart system for water level management. Our concept utilizes an Arduino that can provide monitoring level of the water tank. That Arduino will open and close the pump or valve automatically so that the water is not overflown and wasted. We are using the float sensors which will sense the level of the water.

Keywords: *Water level, Float sensor, Arduino, GSM Module, Internet of Things(IoT).*

1.   Introduction

The Internet of Things (IoT) has overwhelmed the world since its origination. Connecting everything by remote innovation summarizes IoT. We can interface anything utilizing the sensors planned explicitly for objects. IoT is the system of objects, gadgets, cars, houses and different things implanted with electronic sensors, and networks to empower them to converse with one another and execute capacities. IoT is advancing quick close by with the most recent advancement happening in remote innovation and implanted advances.[6] With Microcontrollers dealing with low powers presented that are ideal for remotely sent IoT frameworks to interface us and work for a considerable length of time with no support has made the IoT not just for extravagance works yet in addition for needful information total concerning barrier frameworks.[8] The gadgets partaking in IoT are intended to be interoperable with various merchants of inserted controllers just as with various remote advances. IoT is advancing with a huge number of things associated every day to create huge measures of data bringing about helpful future activities. This work centers on an answer for 'Water Level Management' in urban territories with the assistance of IoT. Water is valuable and the supply should be controlled. Water demand is exponentially developing high with the expansion in population of the urban regions[4].

Literature Review

The Internet of things has been linked with cities, smart homes and also to manage traffic systems where it would control the way our home automation and traffic lights would operate. However, an unknown fact about Internet of Things technology is that it is also applicable across many other areas linked with our day to day life, another such area where the Internet of Things technology can play a major role is water level management. [5] This work centers around an answer for 'Water the board' in urban zones with the assistance of IoT. Water is valuable and the stock should be controlled. Water request is exponentially developing high with the expansion in the populace of

the urban regions. To maintain the supply and demand ratio properly, it is essential to have a system to prevent loss of water and hence we have designed a system to track the level of water in water tanks. [1] The system basically uses sensors to track the level of water inside a water tank and to on and off the pump or valve depending on the water levels inside the tank. Among others, we can screen our day to day utilization of water by estimating the amount through a suitable gadget and send the data of water consumption to the appropriate device [2] The system can also detect the purity level of the water using different kinds of purity sensors
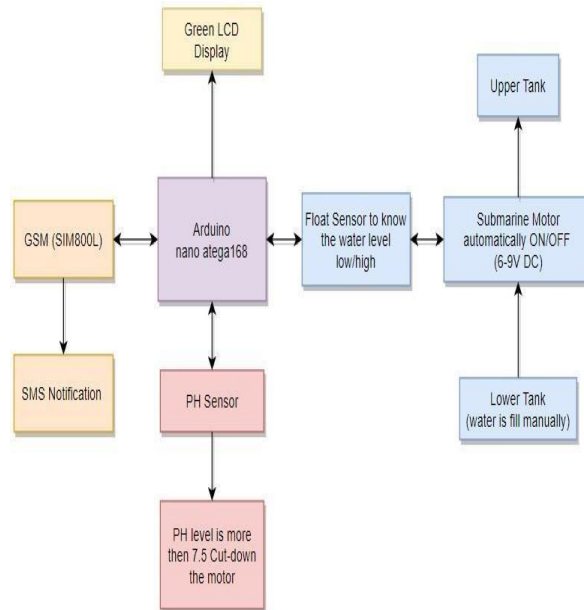
1. BLOCK DIAGRAM

Figure 1: Block Diagram

Float sensors in the upper tank will identify the degree of water. Flout sensor is utilized as a water level sensor. Detection will be done by working the transistor in switch mode. At the point when a specific water level will be detected and the rating level will be sent to Arduino through GSM module. This information through the GSM module will be received through the SMS and will be shown to the end user. In this SMS the past water levels will be shown alongside date and time. At the point when the water level goes beneath low level, the engine will naturally turn on and at the point when water level goes above elevated level, the engine will kill automatically. The purity level of the water can also be checked using purity sensors.

2. HARDWARE REQUIREMENT
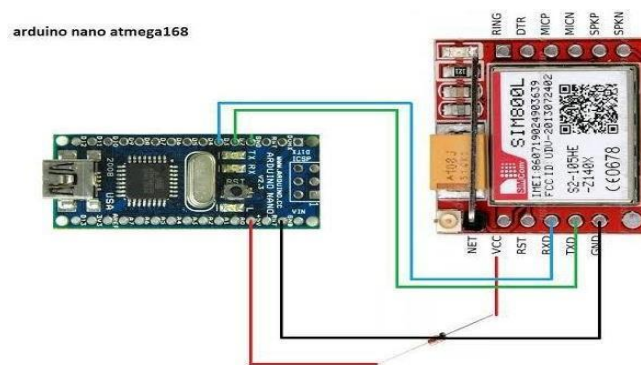
Figure 2: Arduino Setup

For the structure of this equipment we have utilized Adreno straightforward connection GSM module intended for IOT applications Flout sensor are utilized as water level sensors, Transistor utilized in change mode to distinguish the level, 1 kw resistors to restrict the ebb and flow coursing through the base and drove for sign of levels and a little water tank for show reason.

We are utilizing the most well-known module dependent on SIM800L and Arduino Uno for this instructional exercise. Interfacing a GSM module to Arduino is quite basic. You just need to make 3 associations between the GSM SIM800L module and Arduino Nano atmega168.

A GSM Module is fundamentally a GSM Modem (like SIM 800L) associated with a PCB with various sorts of yield taken from the board – state TTL Output (for Arduino nano atmega 168, and different microcontrollers) and Output to Green LCD Display 16*2. The board will likewise have pins or arrangements to join mic and speaker, to take out +5V or different estimations of intensity and ground associations. This kind of arrangement shifts with various modules.

Bunches of assortments of GSM modem are accessible in the market to browse. For our venture of interfacing a GSM SIM800L modem or module to Arduino and henceforth send and get SMS notification in every case. It's a great idea to pick an Arduino perfect GSM SIM800L Module that is a GSM module with TTL Output arrangements.
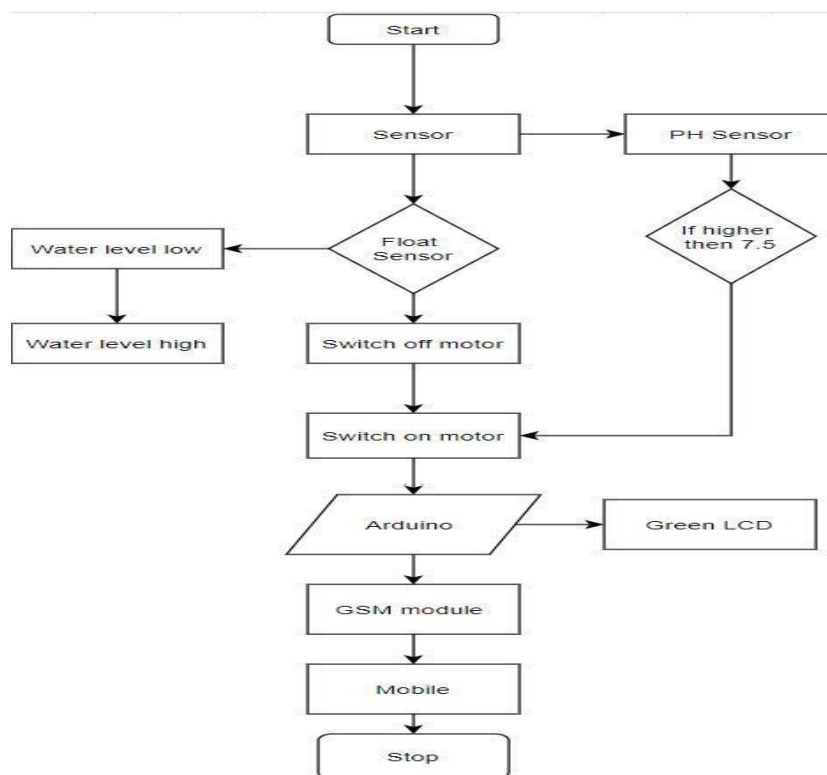
3. FLOW CHART

Figure 3: Flow Chart

4.   WORKING

First the sensor senses water in the tank. We are using a float sensor here, if the water level is lower than the float sensor will sense it and sends the information to the Arduino which will assess the information and send a message alert to the user and will also switch on the motor/pump. Once the tank is completely filled the sensor will detect and send the information to the Arduino which will send a message to the user and will switch off the pump. The purity sensor which is placed before the pump will sense the level of purity of water and will block the water if the water is impure. The daily consumption of water will be recorded and sent to the user via SMS and will also be displayed on the screen.
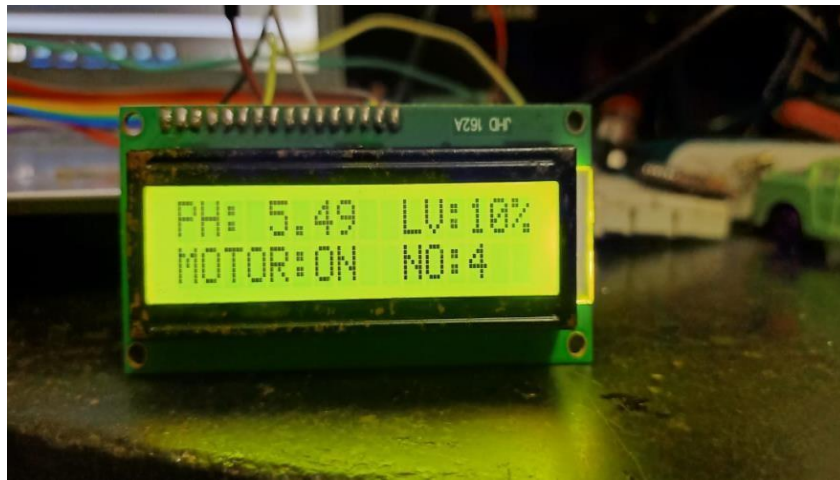
Figure 4: LCD Display

Figure 5: LCD Display

The Green Display which is connected to the Arduino will display the small details as shown in the above pictures and a table will make it easier to understand.

Days/ Weeks	P H L e v el	Mot or OF/ OFF	Consumption
1	5. 4 9	3	90%
2	5. 4 9	4	10%

Table 1: Weekly report

5. CONCLUSION & FUTURE SCOPE

In our proposed framework, water level can be observed consistently from anyplace GSM module. Engine can be controlled naturally and full shrewd mechanization is accomplished. It is a hearty framework and little in size. This gadget can be executed at individual level. It tends to be actualized in a cottage or at modern level. In a cabin it very well may be utilized as correspondingly portrayed as above and in industry it tends to be utilized to check water levels of various tanks comprising various sorts of fluids. As per the degree of fluids SMS will be sent to the approved individual. At industry rather than Float sensor we can utilize ultrasonic sensors which give increasingly precise and aligned data. It can likewise be in flood inclined regions to make the individuals by sending SMS aware of the close by individuals living. This should be possible by actualizing the gadget at the banks of the waterways which are flood inclined. So if water level transcends a specific level SMS will be produced on Arduino and an alarm can be sent to everybody. This framework can likewise be utilized in dams in comparable design.

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