

# PH LEVEL & WATER FLOW MEASUREMENT SYSTEM USING ARDUINO

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**ABSTRACT** - THE PROJECT IS DESIGNED TO DEVELOP AN AUTOMATIC WATER FLOW MEASUREMENT SYSTEM THAT DISPLAYS FLOW RATE. USE OF PROPER METHOD OF MEASUREMENT IS IMPORTANT. THE ADVANTAGE OF USING THIS METHOD IS TO REDUCE HUMAN INTERVENTION. THE PROJECT USES AN ARDUINO BOARD WHICH IS PROGRAMMED TO RECEIVE THE INPUT SIGNAL OF VARYING FLOW RATE CONDITION OF THE PUMP THROUGH A FLOW SENSOR ARRANGEMENT. THIS IS ACHIEVED BY INTERFACE BETWEEN THE SENSING ARRANGEMENT AND THE ARDUINO. ONCE THE CONTROLLER RECEIVES THIS SIGNAL, IT GENERATES AN OUTPUT THAT DRIVES LCD DISPLAY IS ALSO INTERFACED TO THE ARDUINO CONTROLLER TO DISPLAY THE STATUS OF THE WATER FLOW RATE. THE CONCEPT IN FUTURE CAN BE ENHANCED BY INTEGRATING GSM TECHNOLOGY, SUCH THAT WHENEVER THE WATER FLOW RATE CHANGES LOW TO HIGH, SMS IS DELIVERED TO THE CONCERNED PERSON REGARDING THE STATUS OF THE WATER FLOW RATE MEASUREMENT

## I. INTRODUCTION

PH measurement is an important process in many scientific, environmental, and industrial applications. It is used to determine the acidity or alkalinity of a solution. The pH scale ranges from 0 to 14, where:

- pH 7 is considered neutral (e.g., pure water).
- pH values less than 7 indicate acidic solutions.
- pH values greater than 7 indicate alkaline (basic) solutions.

In this project, we will use an Arduino to measure the pH level of a solution. This is achieved by using a pH sensor that can detect the hydrogen ion concentration in a liquid and convert it into an electrical signal. The Arduino then processes this signal to give a pH reading, which can be displayed on a serial monitor or an LCD screen.

## II. OBJECTIVES

- Water flow measurement
- Arduino is used to control
- flow sensor is interfaced to Arduino
- Flow Rate Show on LCD Display.

## III. LIETRATURE SURVEY

Kuganesan Kumar, MoaminA. Mahmoud [1] have developed an online Mobile app that monitors and controls the water flow through taps whenever there is an unusual Reading of the water usage at home. The developed App enables a user in monitoring and Controlling the water flow at home via an online mobile application's graphical user interface (GUI). This makes the monitoring process more efficient and convenient for house owners. Rasin,Z.;Hamzah,H.;Aras,M.S.M

[2] resolves the problem of the manual analytical method Adopted in water flow detection with bad real-time character, this paper introduces a remote Water flow measuring and monitoring system. It has used wireless sensor network based on the ZigBee to realize the water quality parameter remote probing and the realtime monitoring Smart water flow control and monitoring system 2017-2018. Zulhani Rasinand Mohd Rizal Abdullah

[3] make a application which is particularly Used for wireless networks, specifically a water equitable distribution and monitoring system is Been used. A possible communication system for the water equitable distribution and monitoring the quality, and describe our channel measurement approach is proposed. Ejio for VirginiaEbere, Oladipo Onaolapo Francisca

[4] use microcontroller for the automatic Water level monitor with feedback, having passed her necessary tests with the other components interfaced to it, is here by presented. With this implemented system, it is possible to monitor the water level in an over-head tank, switch on the water pump when the tank is empty and switch off the same pump when the tank is full without any need for human intervention. By so doing, the incidence of water wastage is eliminated and abrupt cut-off of water supply is equally also eliminated. T.Deepiga, A.Sivasankari

[5] developing an efficient wireless sensor network (WSN) based water monitoring system. Three different ways to monitoring the water such as water level monitoring, water pollution monitoring and water pipe line leakage monitoring. Finally the water monitoring system of smart homes/office research concept will be completed by using wireless sensor technology. 8 FrankA. Richerand

[6] The system will consist of monitors in tandem or as required working in Conjunction with inter face probes reading in multiple locations, and diversion valves directly Operated based on the output of the interface probe sand monitors. The probes relay the water Interface location at multiple locations throughout the process and send that data to a Programmable Logic Controller (PLC).

#### IV. DESIGN AND IMPLEMENTATION OF PH MEASURMENT USING ARDUINO

The irrigation systems modernization is a part of the water resources management improvement process which requires a decision support system, the core of such system is an automated procedure for simulating the relevant processes governing the system.

Water is necessary thing to sustain life on earth but due to poor management the resources of pure water decrease day by day.

This inflation is due to Poor check and balance on Well Drilling and installing pump.

Discharging of Groundwater is increased to dangerous level and recharging is so less that we are handling this problem by automation process, and the most common sensor which we used to measure the flow of a liquid is a Flow Sensor.

By using a flow sensor with a microcontroller like Arduino, we can calculate the flow rate, and check the volume of liquid that has drilled through the Ground Water table, and control it as required.

Apart from water management, flow sensors can also be found in the agriculture sector, food processing, manufacturing industries, mining industry, water recycling, coffee machines etc.

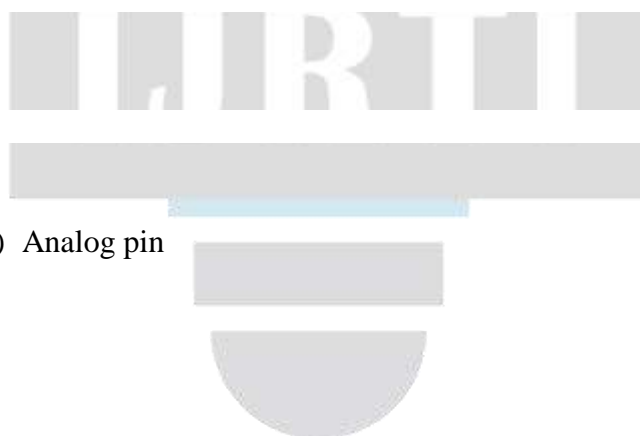
Further, a water flow sensor will be a good addition to projects like Automatic water dispenser and smart irrigation systems where we need to monitor and control the flow of liquids. In this project, we are going to build a water flow sensor using Arduino.

We will interface the water flow sensor with Arduino and LCD, and program it to display the volume of water, which has passed through the valve.

For this particular project, we are going to use the YF-S201 water flow sensor, which uses a hall effect to sense the flow rate of the liquid.

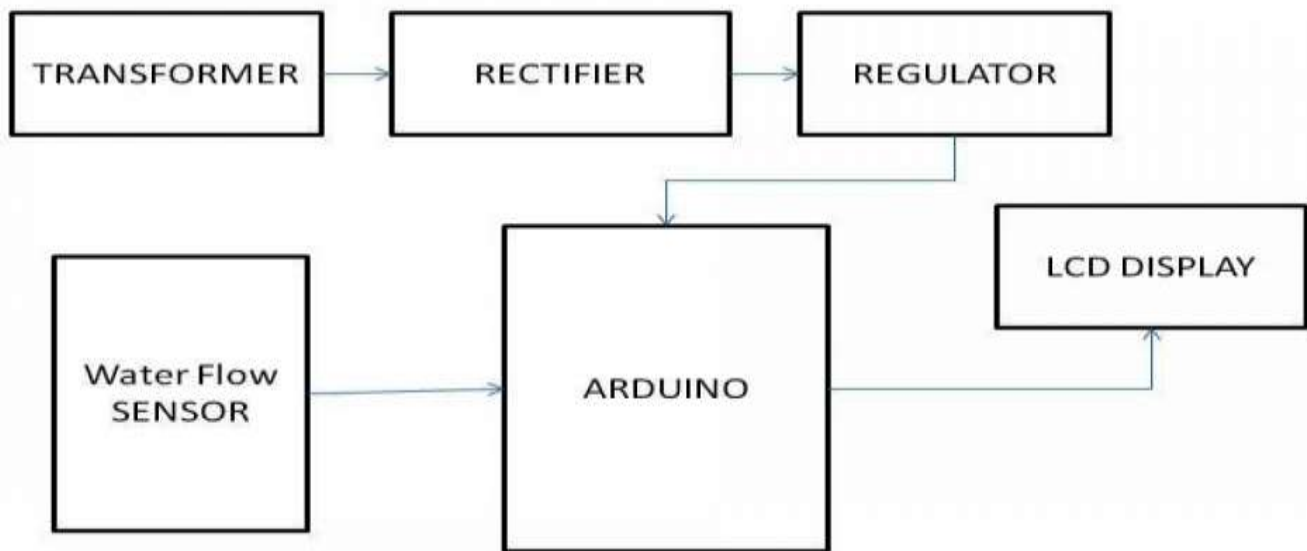
#### V. PROPOSED SYSTEM

- Arduino Board
- pH Sensor Module
- LCD Display
- Jumper wires
- Power Supply
- VCC (Power) .
- GND (Ground)
- Analog Output (AOUT) Analog pin



## VI. BLOCK DIGRAM OF PH LEVEL MEASURMENT USING ARDUINO

BLOCK DIAGRAM



## VII. OUTPUT



## VIII. ADVANTAGES

- No moving parts
- No additional pressure drop
- Essentially flow profile insensitive, only short inlet and outlet sections required
- Unaffected by changes in temperature, density, viscosity, concentration and electrical conductivity
- Favorable choice of materials for chemically aggressive or abrasive measuring media
- Unaffected by contamination and deposits
- Especially suitable for hydraulic solids transport
- Linear relationship between flow rate and measured variable
- Operates in both flow directions (forward and reverse)
- Measuring range setting can be optimized
- Low maintenance, but still easy to maintain

## IX. CONCLUSION

pH is a measure of the hydrogen ion concentration in water. Values lower than 7 indicate acidity and values higher than 7 indicate alkalinity. Drinking water with a pH between 6.5 and 8.5 is generally considered satisfactory. Acidic waters tend to be corrosive to plumbing and faucets, particularly if the pH is below 6. Alkaline waters are less corrosive. Waters with a pH above 8.5 may tend to have a bitter taste

## X. FUTURE WORK

- I. We develop a water utility system where people can go to fetch water and insert their cards with some credit on them and when they do so, the system first accepts the payment before it dispenses the water equivalent to the credit paid.
- II. For that system we use RFID System and a keypad. Rfid for access controlling and keypad for selecting amount/volume of water that is to be drawn.
- III. web pages can be created to monitor the data remotely For, this system will be developed by sending river water level data and stream flow rate data into the database server.

## XI. REFERENCES

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