

e-ISSN: 2319-8753 | p-ISSN: 2320-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 4, April 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.512



9940 572 462



6381 907 438



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Digital Hydro Meter-An Approach to Detect the Illegal Water Supply with Real Time Billing System

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ABSTRACT:-The water is one is considered to be of the fundamental pieces of an individual's life. Thus, Water contamination and illegal water connection is one of the huge issues in our country. To guarantee the protection gracefully of the regulated water for the usage of various purposes the water should be checked. This paper presents a plan of a minimal effort framework for continuous observing of the water quality and quantity with bestow of IOT (Internet of things). The framework having a few sensors will help with the water flow measurement. The deliberate qualities from the sensors can be handled by the regulator. The Arduino model can be utilized as a regulator. At last, the sensor information can appear on the web as well as on the Oled Screen with the utilizing the WI-FI framework. A cloud worker was arranged as information sparing and examination. This information can be utilized in future innovative work which will be integrated in a Digital HydroMeter. This project seeks to be helpful for the Indian government facing problems with the illegal water connection.

KEYWORDS: Internet of Things, IoT, Monitoring, flow sensors, Cloud figuring, Wi-Fi modules, Oled, Real Time Billing, Detecting Illegal Water Supply, Digital Hydro Meter.

I. INTRODUCTION

As of now drinking water is considered to be the most valuable for the mob. As of late water levels are low and water in the lakes are going down. So, it's too critical to even consider finding the answer for water checking and control framework. Thus, for this IoT is an answer. As of late, improvement in processing and gadgets advancements has set off Internet of Things innovation. IOT of Things can be portraying as the organization of hardware gadgets imparting among them by the assistance of a regulator. The IoT is an assortment of gadgets that cooperate to serve human errands in a productive way. Hence, The IoT is an assortment of gadgets that cooperate to serve human assignments in a proficient way. It joins computational capacity to send information about the conditions. These gadgets can be in type of sensors, apparatuses, implanted frameworks, and information investigation central processor. This paper seeks to

present a low-cost water hardware system, which is a solution for the illegal water connections and is also capable of measuring the water wastage and quality. Thus, the Microcontrollers and sensors are used for the compatible system. Therefore, the illegal water connection can be calculated with our device called Digital Hydro Meter that has the capability to measure the water flow, velocity and pressure with the considerable real time billing system presented in the foremost OLED and is seek to showcase it outcome on the could base software system. These determined qualities from the sensors can be handled by the Microcontrollers and transferred to the web through the Wi-Fi module that is ESP 8266. The Examination can be done by considering how much water is utilized in certain time, which can be in a min, in an hour or in a month. Hence, this system created by the sensors is communicated over the Internet to a cloud worker and seek reach to the client terminal possessed of government offices .

II. RELATED WORKS

In the related work considered –

1) The author A.N.Prasad ET.AL proposed that in recent times, tremendous growth of Internet of Things applications is seen in smart homes. The large variety of various IoT applications generally leads to interoperability requirements that need to be fulfilled. Current IoT project is achieved using physical platforms that lack intelligence on decision making. A architecture that implement Event-Condition-Action (ECA) method is proposed to solve the management of heterogeneous IoTs in smart homes. The proactive architecture, developed with a core repository stores persistent data of IoTs schema, proved to be an ideal solution in solving interoperability in smart homes.

2) The author Anirudh Das ET.AL proposed that drinking water the quality needs to be monitor in real time. In this paper we present a design and development of a low cost system for real time monitoring of the water quality in IoT (internet of things). The system comprises of many sensors is used to measuring physical and chemical parameters of the water.

3) The author S. Meniconi Et.AL shown how to monitor the water level of water systems such as water tanks, rivers, ground water table, and bore wells remotely. They also shown that how to control the working of pump automatically and remotely. It can be used to remotely monitor the flood affected areas wirelessly and information can be sent to mobile wirelessly. This system is designed to monitor the level of water with the help of water level sensors.

4) This author K. Jaiswal ET.AL considers to propos with the hypothesis on ongoing observing of water quality and amount utilizing IoT. The framework comprises of Arduino, microcontroller, distinctive kind of sensors like water stream sensor, pH and turbidity sensor and ultrasonic sensor. The Arduino is the fundamental processor of the framework which control and interaction the information produced by the sensors.

5) This author Barabde ET.AL seeks the easy installation of the system that is the base station can be placed at the local residence close to the target area and the monitoring task can be done by any person with very less training at the beginning of the system installation. Performance modelling is one important aspect in different environment to be studied in the future as different kind of monitoring application requires different arrangement during system installation.

6) This author Prof. Yuvaraj T ET.AL consider the remote real-time high-frequency water quality monitoring system based on the WSN solution is presented. The system consists of data acquisition module, data transmission module, power supply module, data storage module and data redistribution module which covers the whole processes of WSN-based water quality monitoring system. The system utilises Bristol Is Open programmable city infrastructure. The Wi-Fi network for the WSN solution is commonly available in smart.

III. MOTIVATION

The Illegal Water connection and water shortage is a worldwide issue, which requires continuous change of water asset core value at the degrees of global down to singular wells. It has been studied that water contamination is the main source of sicknesses around the world. The records show that in excess of 10000 individuals bite the dust day by day around the world. In India unsurprising 500+ individuals kick the bucket of water contamination related issues each

day. Exploration has demonstrated that following not many years the amount of valuable water will be goes down to least level. In many non-industrial nations, grimy or debased water is being utilized for drinking with no legitimate previous utilizing it. One reason for this incident is the ignorance of public and organization and the absence of water quality checking framework which makes genuine worldwide issues. Like-wise normal impacts, for example, volcanoes, green growth colors, and tremors additionally change the quality and natural status of water.

IV. PROPOSED SYSTEM

4.1. System Overview

By considering this project, we present the real time theory of detecting the illegal water connection and monitoring the water quantity using IoT. The system considered to have Arduino, microcontroller with different type of sensors like water flow sensor. The Arduino seeks to be the main functioning of the system which controls, process and displays the data generated by the sensors.

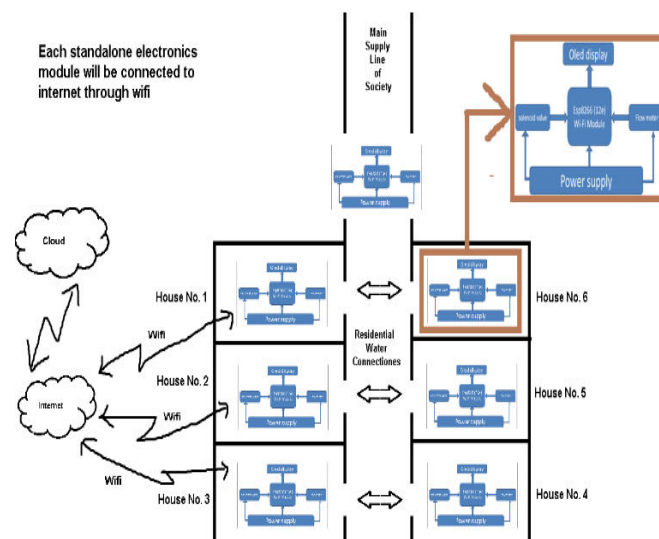


Figure.1: Wi-Fi module

The Wi-Fi module which is considered to the node MCU is connected to the Arduino device which seeks to transfer the data to the cloud from internet. The water flow sensor measure the quantity of water flow through the pipe in a given time, this data will be sent to cloud for storage and analysis purposes. Determine whether the water is useful for drinking or any agricultural purposes.

4.2 System Architecture

Taking about this proposed system, it is clearly shown that it has several components which help to build a water monitoring system. The essential component of the system of smart home automation is:

Arduino Software: -

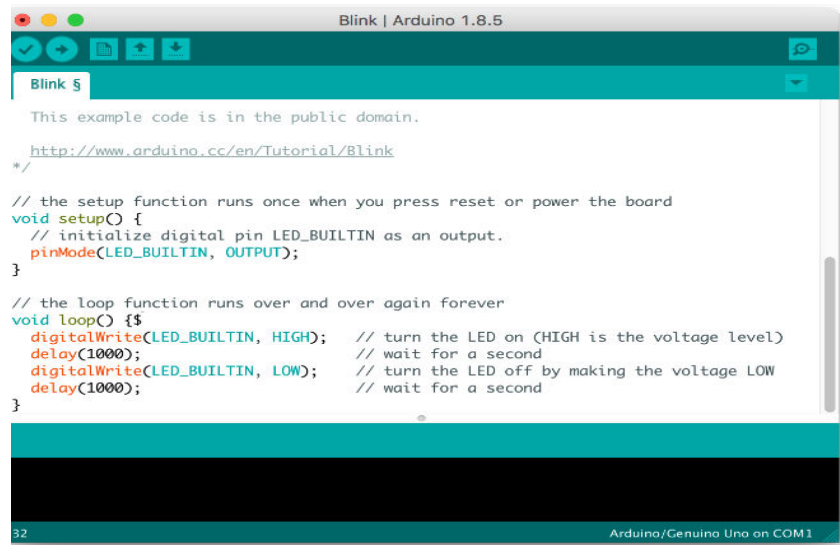


Figure 2: Arduino software

Arduino IDE is an open source programming that is chiefly utilized for composing and incorporating the code into the Arduino Module. It is an authority Arduino programming, making code gathering too simple that even a typical individual with no earlier specialized information can consider going all in with the learning cycle. It is effectively accessible for working frameworks like MAC, Windows, Linux and runs on the Java Platform that accompanies inbuilt capacities and orders that assume a crucial part for investigating, altering and arranging the code in the climate. A scope of Arduino modules accessible including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro and some more. Every one of them contains a microcontroller on the board that is really modified and acknowledges the data as code. The fundamental code, otherwise called a sketch, made on the IDE stage will eventually produce a Hex File which is then moved and transferred in the regulator on the board. The IDE climate predominantly contains two essential parts: Editor and Compiler where previous is utilized for composing the necessary code and later is utilized for incorporating and transferring the code into the given Arduino Module. This climate underpins both C and C++ dialects.

4.3. WIFI Module

The wifi module is considered to a self SOC with incorporated TCP/IP convention s that can give any microcontroller admittance to your WiFi organization

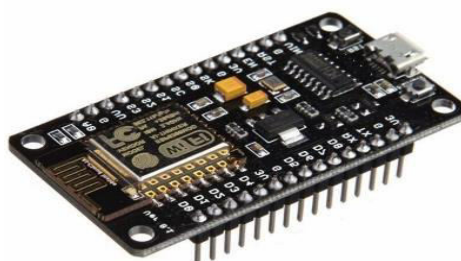


Figure.3: Micro controller

The ESP8266 is capable of hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module come pre-programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective.

4.4 Flow sensor:

The flow sensor is capability used to measure the flow of water.



Figure.4: Flow sensor

This sensor basically consists of a plastic body, a rotor and a sensor. The pinwheel rotor rotates when water / liquid flows through the pipe and its speed will be directly proportional to the flow rate. The Hall Effect sensor will provide a pulse with every revolution of the pinwheel rotor.

- Cloud-Based Server: Cloud goes about as a database to store every data generated by the sensors installed in the home. This cloud server help to send email alert about different situation in home to the client.
- Sensors: A sensor is an electronic device that detects and responds to some type of input from the physical environment. In this different type of sensors are used like temperature sensor, pH sensor, turbidity sensor, ultrasonic sensor which detect the change in environmental phenomena.
- Ultrasonic sensor: Transmitters convert signal into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound. This helps to measure the water level.

4.5 OLED:

OLED Light Emitting Diode (OLED) is a sort of Light Emitting Diode where a light discharging layer which is made of natural compound emanates light when electric flow is provided.

OLEDs basic structure consists of organic materials positioned between the cathode and the anode, which is composed of electric conductive transparent Indium Tin Oxide (ITO). The organic materials compose a multi-layered thin film, which includes the Hole Transporting Layer (HTL), Emission Layer (EML) and the Electron Transporting Layer (ETL). By applying the appropriate electric voltage, holes and electrons are injected into the EML from the anode and the cathode, respectively.



Figure.5: OLED

This layer is set between two anodes. This innovation is utilized in presentation screens like PCs, TVs, cell phones and so on OLED shows have their own light and needn't bother with any backdrop illumination like in LCD, in this manner they are power proficient and utilized with numerous microcontrollers. One more preferred position of utilizing OLED shows over LCD is of showing huge and better nature of designs on OLEDs.

4.6 Output:

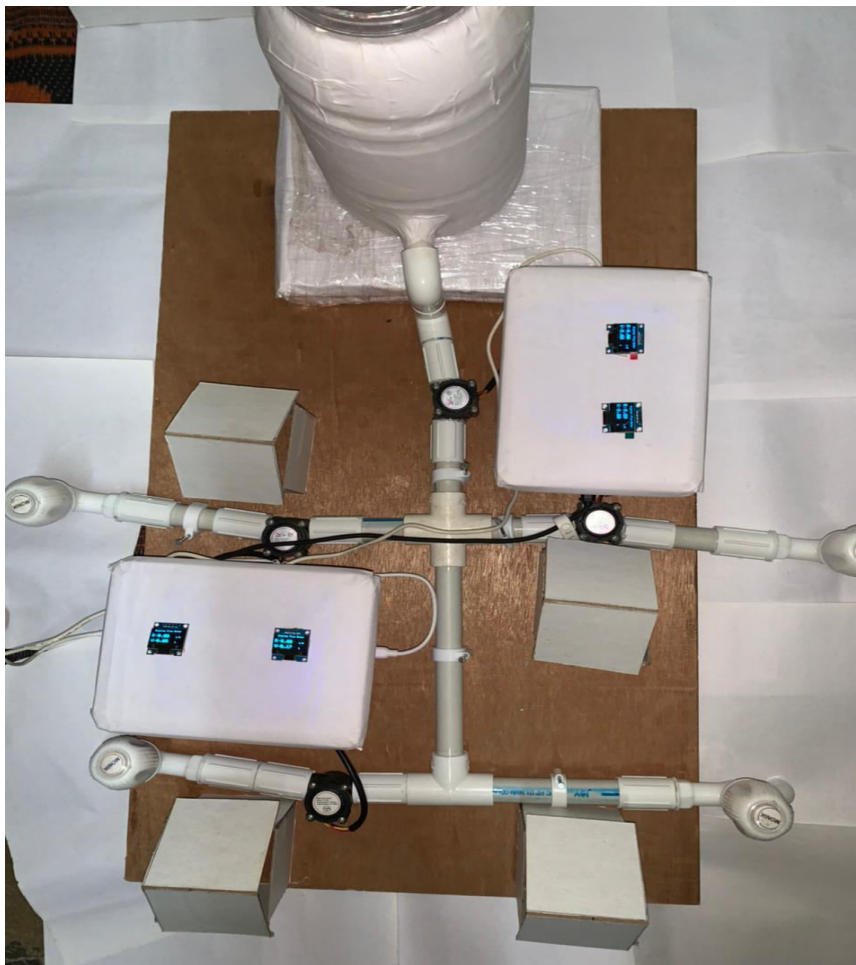


Figure.6: Hardware module/output

Figure 1 displays two charts comparing data over time. The left chart, titled 'Field 1 Chart', shows 'flow rate' on the y-axis (ranging from 0 to 2) against 'Date' on the x-axis (ranging from 11. Mar to 12.00). The right chart, titled 'Field 2 Chart', shows 'Total Inters' on the y-axis (ranging from 0 to 0.1) against 'Date' on the x-axis (ranging from 11. Mar to 12.00). Both charts include a 'ThingSpeak' logo and a 'Channels - Apps - Support +' header.

V. CONCLUSION

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