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MONITORING WATER QUALITY USING IOT

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Abstract - Water is one of the most important and basic natural resources. Water is not only one of the most essential commodities of our day-to-day life, but the development of this natural resource also plays a crucial role in economic and social development processes. While the total amount of water available in the world is constant and is generally said to be adequate to meet all the demands of mankind, its quality and distribution over different regions of the world is uneven and causes problems of scarcity and suitability.We demonstrated a miniaturized bacteria-based Biosensing platform for sensitive, reliable and practical on-line monitoring of water quality. Two biosensors were integrated into a dual-channel micro fluidic device which operated as detection and a reference sensor, respectively. By providing a reference-compensated sensing response, the device was capable of minimizing environmental interferences such as temperature and flow rate, ultimately leading to high sensitivity and reliability in water quality monitoring.

Keywords— Water quality, Internet of Things (IoT)

1. INTRODUCTION

The 'Phytorid Technology' is a combination of the physical, chemical and biological processes which resulted in ultimate treatment for the waste water. This particular technology works without electricity, minimum maintenance, less manpower and importantly self sustainable. 'Phytorid Technology' is a patented technology and is very effective in water pollution control as it functions as "pollutant" sinks for sediment, nutrients, and metals. There are different mechanisms that play an important role in treating waste water in the wetland, principal measures are sedimentation, bacterial action, filtration, decomposition, nutrient uptake and vegetative system.

2. LITERATURE SURVEY

1.Water pollution is one of the biggest fears for green globalization. In order to ensure the safe supply of the drinking water the quality needs to be monitored 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 consists of several sensors used to measure physical and chemical parameters of the water. The parameters such as temperature, PH, turbidity, flow sensor of the water can be measured. The measured values from the sensors can be processed by the core controller. The Arduino model can be used as a core controller. Finally, the sensor data can be viewed on the internet using the WI-FI system.

2.Traditional water quality monitoring involves three steps namely water sampling, Testing and investigation. These are done manually by the scientists. This technique is not fully reliable and gives no indication beforehand on quality of water.

2.1. DISCUSSION

A. EXISTING SYSTEM:

Water monitoring is a tough challenge in comparison to local smart sensor networks, mainly due to the hostile environment and long distances involved.In addition, the most important biological indicator of water quality, the molecule, does not exhibit a homogenous distribution in seawater but rather a spatial patchiness, meaning that events of potential interest can even happen on a scale of a few tens of meters. Water quality measurement is required in swimming areas, water pools, and seafood areas(fishes). If the quality of water is low it causes diseases. And also it necessary in drinking water is important,

DISADVANTAGES:

- Caused illnesses to swimmers, such as rhinitis, pharyngitis, laryngitis, bronchitis, high fever, dermatitis, and conjunctivitis.
- Drinking of unpurified water causes heavy fevers.

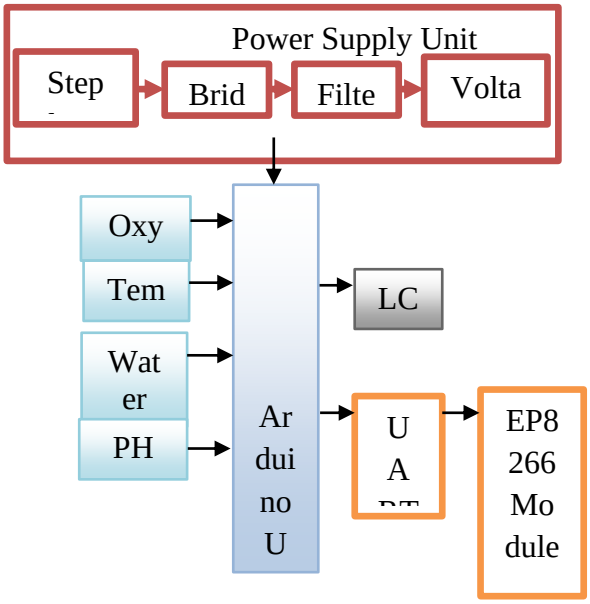
B. PROPOSED SYSTEM:

- The proposed water monitoring system is used to measure the water quality using oxygen sensor, Temperature sensor (LM35), Water Level sensor and Ph sensor.
- When the Water level is below the threshold level means that area can be sent to the server immediately through the IOT module.
- By using the advanced sensor networks we can detect the quality of water easily and protect humans from attacking unwanted diseases.
- Using these sensor values it is easy to identify the purification levels in water.
- When the pH level is abnormal the threshold level means that area can be sent to the server immediately through the IOT module.

ADVANTAGES:

- The use of the standard, besides increasing the robustness of the system, also provides considerable flexibility.
- Once implemented, new devices can be added without having to make any further changes to the network.
- We can detect accurate values of physical quantities in water.
- Prevent humans from unwanted diseases.

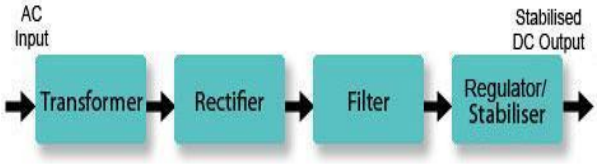
C. MODULE DESCRIPTION & DIAGRAM



BLOCK DIAGRAM

D. POWER SUPPLY UNIT:

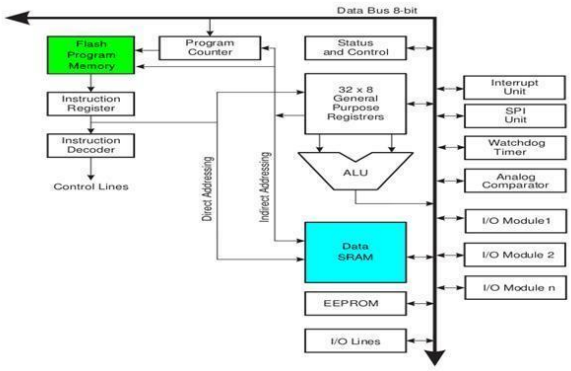
Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.



Power Supply unit

E. ARDUINO ARCHITECTURE:

Arduino's processor basically uses the Harvard architecture where the program code and program data have separate memory. It consists of two memories- Program memory and the data memory.The code is stored in the flash program memory, whereas the data is stored in the data memory. The Atmega328 has 32 KB of flash memory for storing code (of which 0.5 KB is used for the bootloader), 2 KB of SRAM and 1 KB of EEPROM and operates with a clock speed of 16MHz.



Arduino pin diagram

F. SENSORS IN WATER QUALITY:

OXYGEN SENSOR

An oxygen sensor is an electronic device that measures the proportion of oxygen (O_2) in the gas or liquid being analysed.

Oxygen sensors are used in oxygen analyzers which find a lot of use in medical applications such as anesthesia monitors, respirators and oxygen concentrators. Oxygen sensors are also used in hypoxic air fire prevention systems to monitor continuously the oxygen concentration inside the protected volumes. There are many different ways of measuring oxygen and these include technologies such as zirconia,electrochemical, infrared, ultrasonic and very recently laser methods.

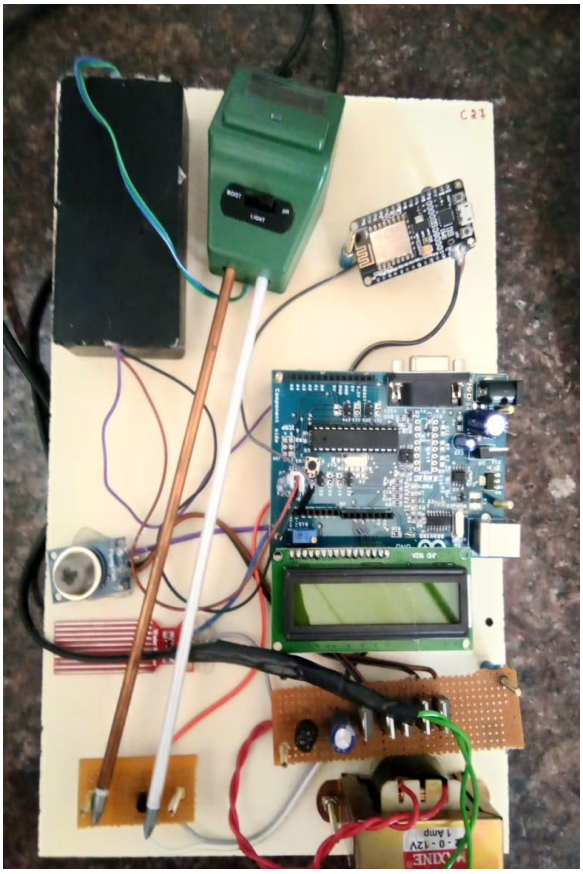
TEMPERATURE SENSOR

Temperature is the most-measured process variable in industrial automation. Most commonly, a temperature sensor is used to convert temperature value to an electrical value. Temperature Sensors are the key to read temperatures correctly and to control temperature in industrial applications. A large distinction can be made between temperature sensor types. Sensors differ a lot in properties such as contact-way, temperature range, calibrating method and sensing element. The temperature sensors contain a sensing element enclosed in housings of plastic or metal. With the help of conditioning circuits, the sensor will reflect the change of environmental temperature.

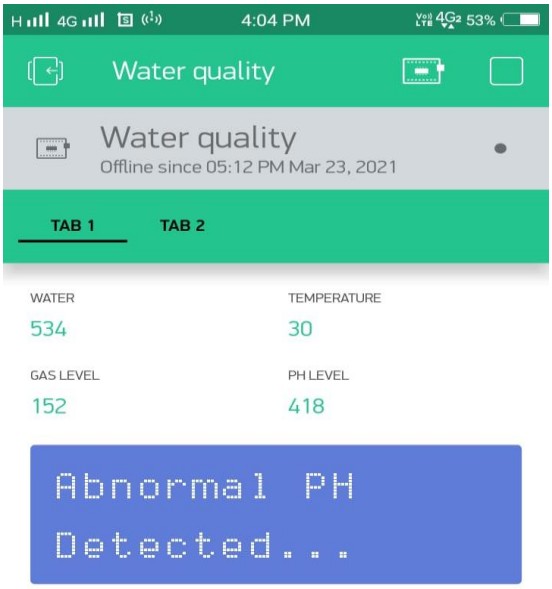
PH TESTER

This multi-purpose meter helps provide a healthy growing environment for all plants. It tests for soil alkalinity / acidity, soil moisture, and sunlight.

3. COMPONENTS SETUP



OUTPUT



4. CONCLUSION

The model delivers an economical and practical solution to monitor the quality of water without any human intervention. To solve the water quality issues, this system uses various technologies such as the Internet of Things (IoT) .The problems of human survival are dealt with to a certain extent. The existing system could be improved by merging the sensor technologies.To improve accuracy, applicability and reliability of the system. In addition, water quality parameter management and decision support systems can be used in sewage treatment plants and in units of water quality prediction and management.

5.REFERENCES

[1] Rashmi M Kittali and Ashok Sutagundar, “Automation of Waste Segregation System using PLC”, International Journal Emerging Technologies(Special Issue on ICRIET-2016).

[2] Nithya L and Mahesh M, “A Smart Waste Management and Monitoring System using Automatic Unloading Robot”, International Journal of Advanced Research in Electrical,Electronics and Instrumentation Engineering, Volume 6, Issue 3, March 2017.

[3] Vishnu Priya M, Mohana Priyanka K and Malar R, “Smart Garbage Monitoring and Segregation Process using Arduino”, International Journal of Advanced Research in Computer Science and Emerging Engineering Technologies.

[4] Dr. M Yuvaraju and Divya Priya C, “GSM Based Automatic Segregation of Waste and Monitoring”, International Journal of Research in Electrical Engineering, Volume 4, Issue 02, 2017.

[5] Neha Kabra, Pradnya Tirthkar, Pratiksha Umak and Ponam Peokar, “Automatic Waste Segregation using Embedded System”, International Engineering Research Journal(IERJ), Volume 2, Issue 8, 2017.

[6] Padmanabh Munde, Abhijeeth Lokhande, Mahesh Kaware, Suyog Waditke, Prof. V R Ghule, “Smart City Waste Management an Innovative Way to Waste Management”, International Journal of Innovations in Engineering Research and Technology(IJIERT).

[7] Prof. Dr. Sandeep M Chaware, Shriram Dighe, Akshay Joshi, Namrata Bajare, Rohini Korke, “Smart Garbage Monitoring System using Internet of Things”, International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering(IJIREEICE), Volume 5, Issue 1, Janauary 2017.