
Water Management System

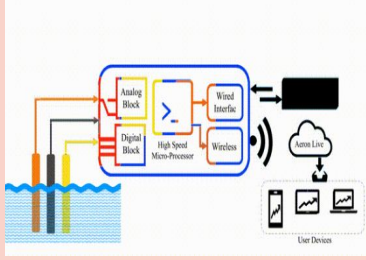
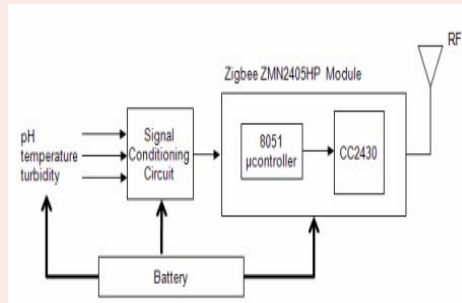
Statement of the problem

- Water plays a key role in sustaining life and building of social structures. With climate change and population growth, it has posed potential **threats** towards water resources sustainability.
- Conservation of water has a high priority around the globe. Study on water management and conservation becomes an important research problem.
- To meet the growing demand of water resources, novel and interdisciplinary solutions have to be in place.
- By using water monitoring system, we avoid the water wastage, power consumption and easily prevent the water for our generation

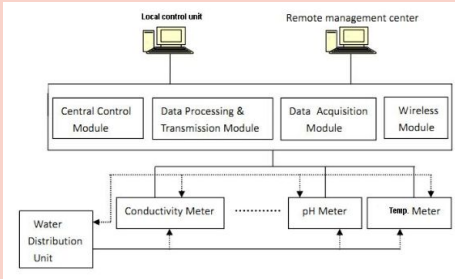

OBJECTIVE OF THE PROJECT

- Since water quality is an important aspect in human life, this project contributes in the direction of monitoring the quality of water.
- The system proposed here is a water quality and usage monitoring system in the Arduino platform that measures the
 - pH
 - Conductivity
 - Temperature
- These sensed parameters are sent to the authorized person via Wi-Fi module to the web, so that proper action can be taken by the authority
- This system also monitors the amount of water used by every house in a large apartment using the Flow sensor.

LITERATURE SURVEY

S. N. o	Ref No.	TITLE	PROTOTYPE	INFERENCE
1.	[9]	water quality monitoring system		A water quality monitoring system has been designed to monitor the aquaculture farm's environment. Sensor Data Logger is the core part of the system. The monitoring system is able to provide data that can be accessed ubiquitously either from the internet or from the mobile phones..
2.	[13]	wireless sensor network (WSN)	 <p>Fig. 2 Block diagram of Zigbee based wireless sensor node</p>	A wireless sensor network (WSN) based water monitoring system has been proposed in the system has been designed and implemented based on ZigBee based wireless technology. The main features of the system are low cost, easy ad hoc installation, easy handling, and easy maintenance. The system uses a high power ZigBee based technology together with the IEEE 802.15.4 compatible transceiver.

LITERATURE SURVEY

S. N. o	Ref No.	TITLE	PROTOTYPE	INFERENCE
3.	[12]	Wireless RF and GSM based water monitoring system		<p>.The system can measure and publish water quality parameters such as temperature, and DO content online.</p> <p>.These data are then stored in a computer. The system has also been designed to control an oxygen-increasing machine. .This machine is able to maintain oxygen level in the water. The test result shows the system can monitor and control the water quality.</p>
4.	[7]	low-cost wireless water quality monitoring system		<p>The proposed system allows users to monitor the quality of water at higher spatial resolution for an extended period of time. The system also helps to understand the behavior of aquatic animals relative to water pollution using data analysis.</p>

HARDWARE DESIGN

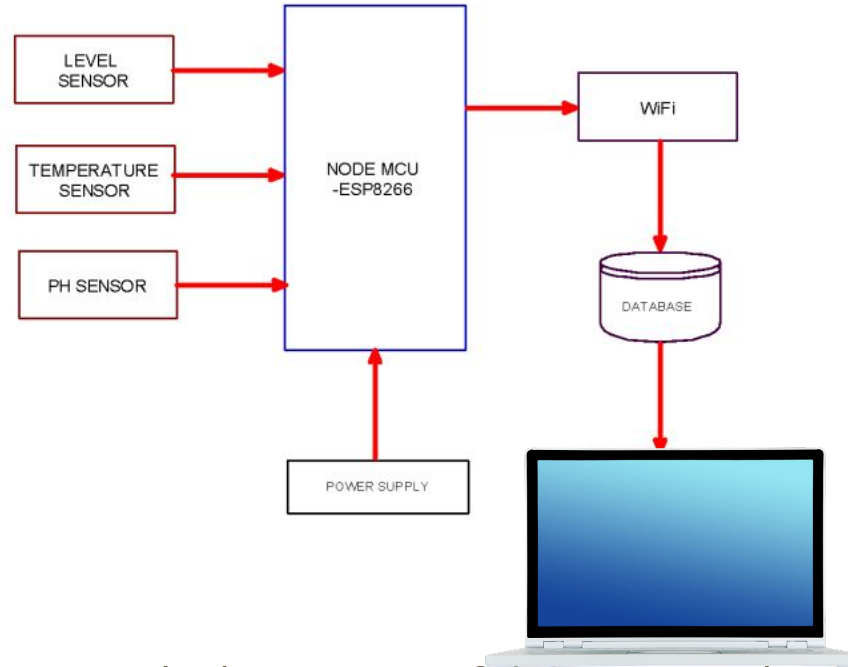


Figure: Block Diagram of the Proposed System

Control Board

- ESP8266 NODEMCU

The proposed system consists of an ESP 8266 microcontroller, sensor unit and power supply. The microcontroller used here is ESP 8266 because it has an inbuilt WiFi module that can connect to any router as it is being programmed. So, it is connected to the Internet at all times. NodeMCU is an open-source firmware and development kit that helps you to prototype or build IoT products.

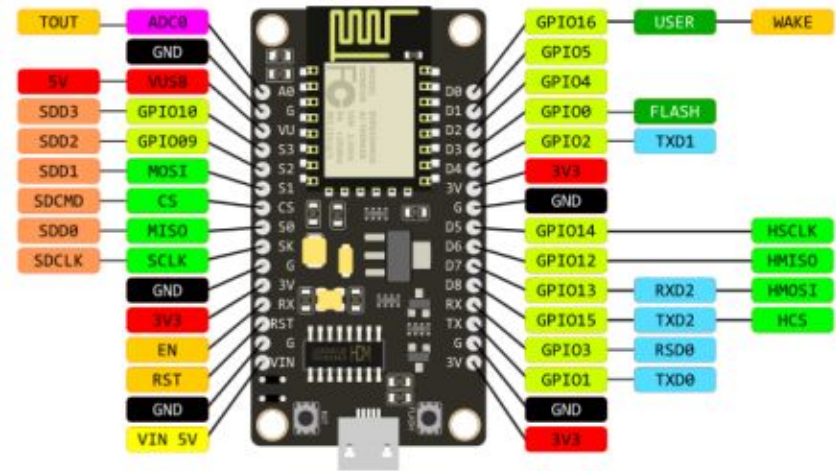


Figure: Arduino ESP 8266

Sensors for Monitoring

In this project, two sensors are used to measure two parameters of water.

1. temperature sensor

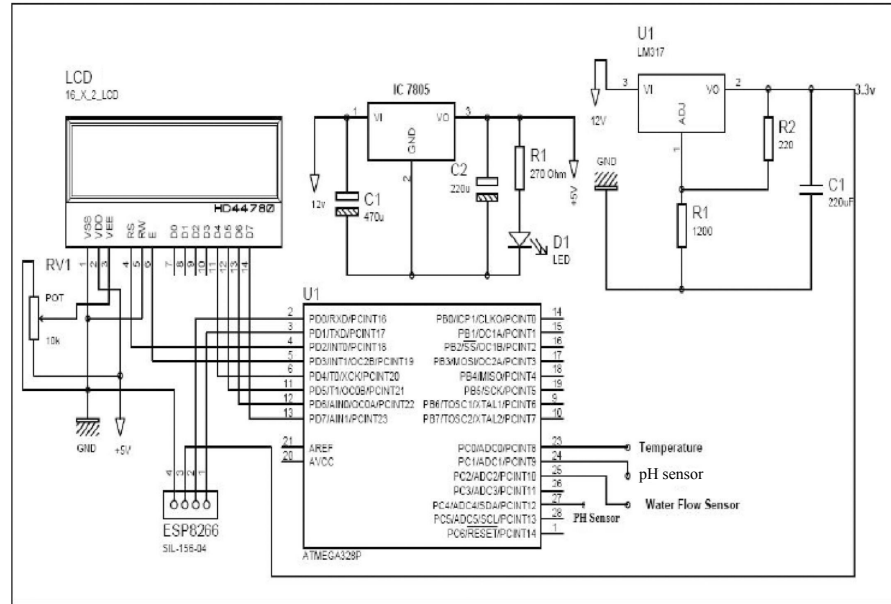
2. pH sensor.

In addition to that two more sensors are also added flow sensor for measuring the water flow of a particular water source. Specification for these sensors is summarized in below table.

Sensor	Manufacturer	Model	Range
Temperature	DIY World	Ds 18b20	55 A o C ~ 125 A oC
Ph	Gray Logix	RC-A-353	0-14pH
Flow	Roinco	YF-S201	1-30 L/min

CIRCUIT DIAGRAM

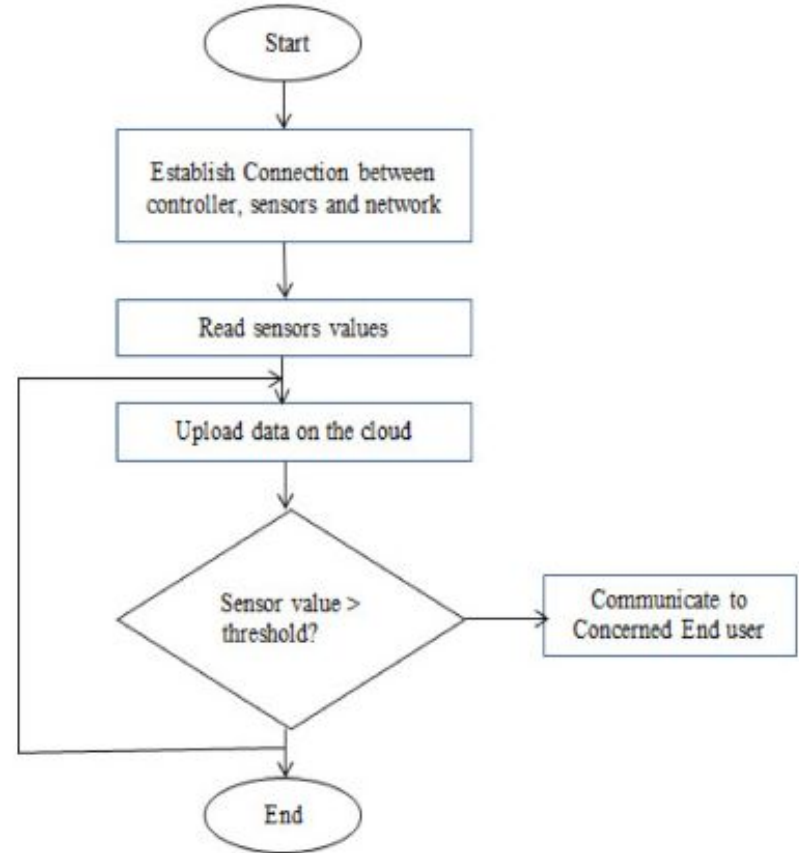
The circuit diagram for water quality monitoring system using ESP8266 is shown in the Fig.



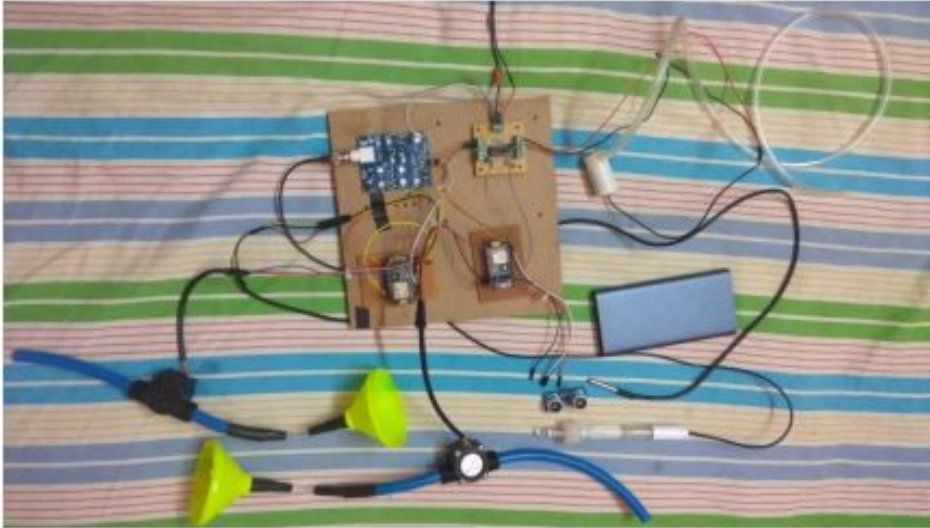
Whenever the sensed parameter values exceed the threshold, message is sent to authorized person.

Data Acquisition Process

Fig shows the data acquisition process from sensors. Sensors are interfaced with Arduino board. The hardware part has sensors which help to measure the real time values, another one is Arduino converts the analog values to digital one and output from sensors, Wi-Fi module gives the connection between hardware and software. In software we developed a program based on embedded language.

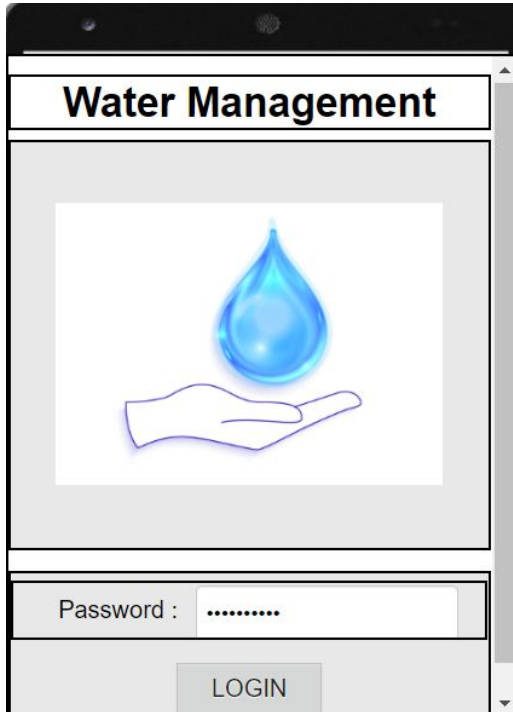


EXPERIMENTAL SETUP




After the establishment of reliable network, the sensor nodes at different areas start sensing the respective data and are transmitted to mobile. Three physical sensors pH, flow sensor and water proof DS18B20 Temperature Sensor are connected to Arduino. Whenever the sensed parameter values exceed the threshold, message is sent to authorized person. The hardware implementation of sensor node and nodes deployed at different overhead tanks are shown in the Figure.

App Setup

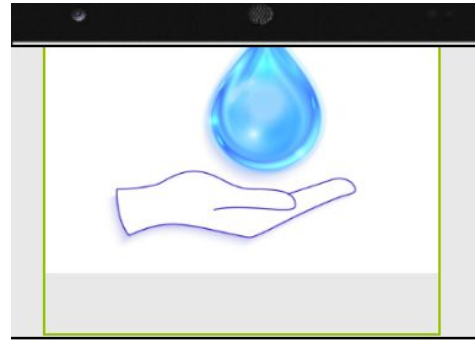


Water Management



Password :

LOGIN

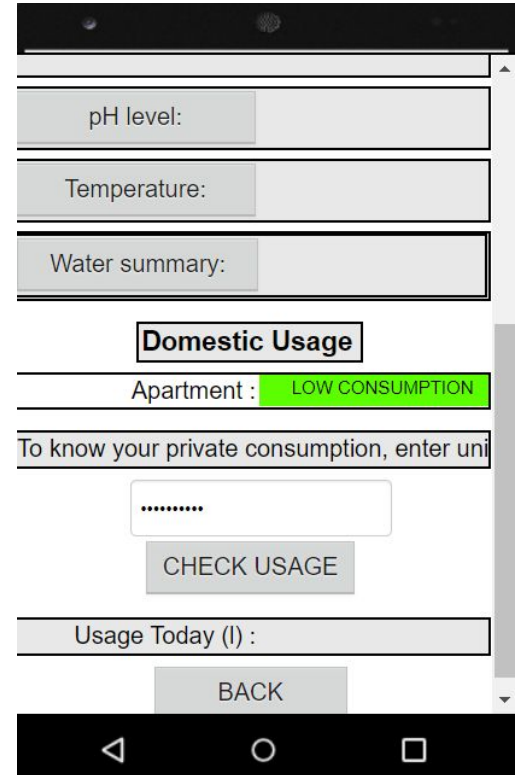


the hardware setup and the software implementat

Hardware & Software
Components

Real Time Monitor

LOGOUT



pH level:

Temperature:

Water summary:

Domestic Usage

Apartment : LOW CONSUMPTION

To know your private consumption, enter uni

.....

CHECK USAGE

Usage Today (l) :

BACK

Conclusion

- The system is extremely adaptable and economical.
- This proposed system that measures numerous parameters pertaining to the water and send them to the monitoring center.
- The system can monitor water quality automatically, and it is low in cost. The system has good flexibility. '
- The system is reliable and easy to maintain and it can be extended to measure water pollution as well.
- By effectively using the proposed system, one can save time and cost can also be reduced.

FUTURE WORK

- The capability of water quality monitoring system can be enhanced to obtain more efficient reliable results.
- The number of parameters to be sensed can be increased by the addition of multiple sensors to measure dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia nitrogen, nitrate, nitrite, phosphate.
- The system can be further upgraded using wireless sensor networks.
- The system can be expanded to monitor hydrologic, air pollution, industrial and agricultural production and so on.
- It has widespread application and extension value. Work can be carried on to include controlling the supply of water.

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