

3118- Smart Water Management

Phase1: Problem definition

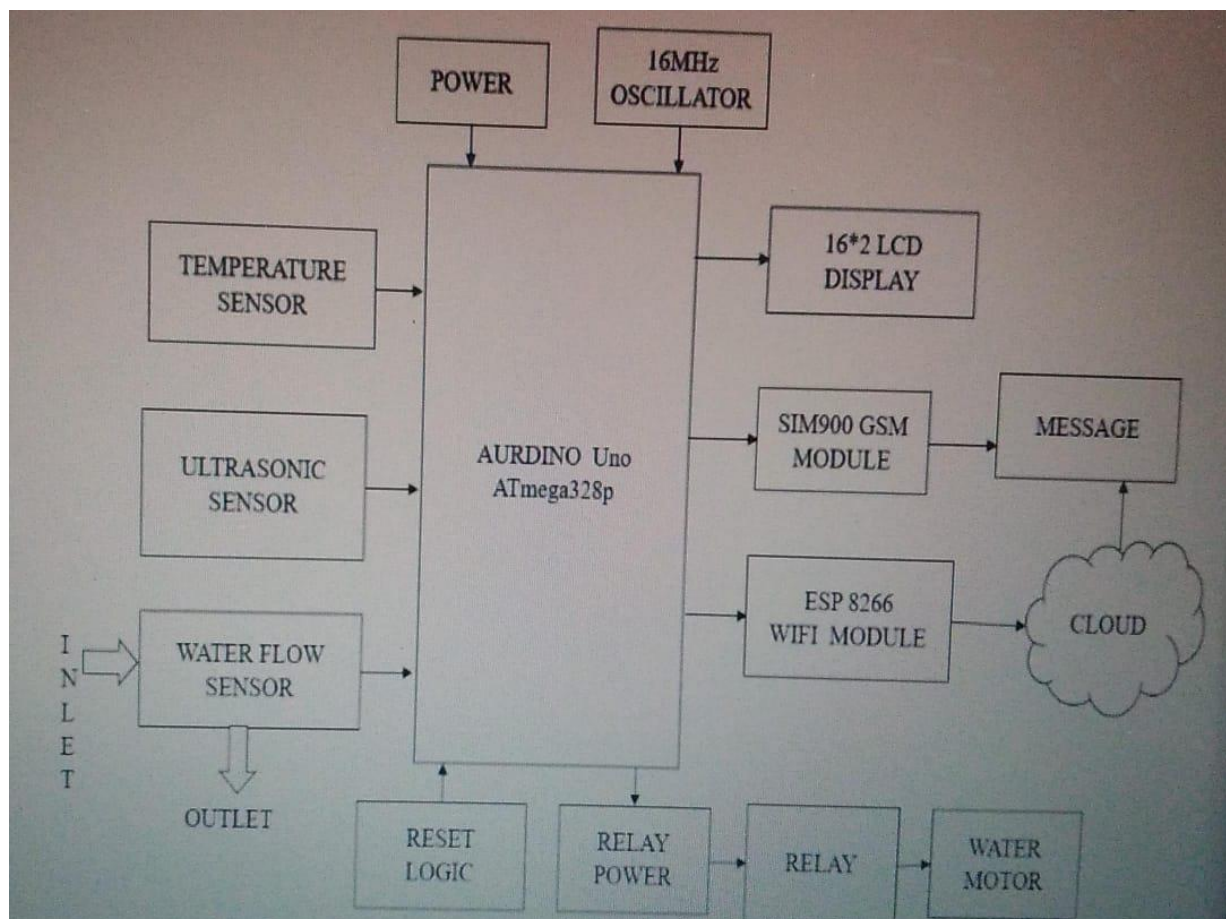
This project helps to regulate the proper maintenance of water tank information to monitoring section with proper updation of records. problem affects various processes in water management, such as water consumption, distribution, Water dust formed in the water tank. These problem can overcome by implementing proper monitoring system and information update system. Set of sensor like Turbidity, Salt sensor, pH sensor and Water flow sensors were used. This sensor informs about the water level tank and communicate to the monitor section. To maintain the tank without bacteria and microbes the Chlorine powder is sprayed if there is any changes in the ph value is found. If the water level reaches minimum position the motor automatically starts and when it reaches the maximum the motor stops automatically. A wireless sensor network is formed by connecting two and more water tanks using RF radio channel transceiver with monitoring section.

DesignThinking

In the 21st century, there were lots of inventions, but at the same time were pollutions, global warming and so on are being formed, because of this there is no safe drinking water for the worlds pollution. Nowadays, water quality monitoring in real time faces challenges because of global warming limited water resources, growing population, etc. Hence there is need of developing better methodologies to monitor the water quality parameters in real time. The monitoring of water quality is extremely important for maintaining the safety of water resources used for various purposes.

IoT is progressing with millions of things connecting each day to generate large amount of information resulting in useful future actions. To ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed. In this project, we will implement the design of IOT for monitoring system that monitors the quality of water in real time.

This system consists some sensors which measure the water quality parameter. The real-time monitoring of water resources information will benefit the water resources management department and the public. The primary concept of real-time IOT based water resources information system is to provide comprehensive and accurate information. The system is developed through defining some explicit water resource parameters then, Water level are defined for water measure & management, followed by a sensor network for water resources information monitoring is constructed based on IOT.



IoT Sensor Design:

BASIC ELEMENTS

A. Micro Controller-

The Atmega328 is one of the very popular microcontroller chip produced by Atmel. It is an 8-bit microcontroller that has 32K of flash memory, 1K of EEPROM, and 2K of SRAM. The Atmega328 is one of the microcontroller chips

that are used with the popular Arduino boards. This microcontroller has an analog pin and digital pin for easy interface of the
 =Microcontroller Operating Voltage: – 1.8 - 5.5V
 23 Programmable I/O Lines
 Two 8-bit Timer/Counters
 Real Time Counter with Separate Oscillator
 Six PWM Channels
 6-channel 10-bit ADC .

B. .IOT Module

Wi-Fi Direct (P2P), soft-AP
 Integrated TCP/IP protocol stack
 +19.5dBm output power in 802.11b mode
 Supports antenna diversity
 Power down leakage current of < 2mA
 Standby power consumption
 Operating Voltage : 3.3V

This is exceeded and it is burn the esp module. GND is connected to the ground terminal. Rx pin is the receiver pin UART serial communication. The Tx pin is a transmitter. GPIO general purpose input and output. Reset pin reset the module apply in 3.3v. the CH-PD pin configure channel.

C. .nRf transreceiver

The nrf wireless transreceiver is 8 pin of the operation. GND pin it is also used to for the ground terminal. Vcc is a power supply operated by the voltage range is 1.9v to the 3.6v and it is mostly apply the 3v . The CE pin is a select the mode of operation either is operated by transmit data or receive a data. CSN it is used to for the enable the SPI chip. SPI provide is high the clock is enable and low the clock is disable. MOSI transmit a data from user module to the external circuit. MISO receive a data from the external circuit or module then finally IRQ is interrupt request pin it is does not need to connect
 Fig 2.3 nrf 2401L Connection in Wireless Communication. This communication is called as Serial Peripheral interface (SPI) . It has following pin name Serial Peripheral Interface, or SPI is a very common communication protocol used for two-way communication between two devices. A standard SPI bus consists of 4 signals, Master Out Slave In (MOSI) Master In Slave Out (MISO), the clock (SCK), and Slave Select (SS) An SPI bus has one master and one or more slaves The master can talk to any slave on the bus, but each slave can only talk to the master. Each slave on the bus must have its own unique slave select signal. The master uses the slave select signals to select which slave it will be talking to.

D. Salt Sensor

It is used to monitoring the salt content of the sewage water and

communicate with microcontroller for posting this information to internet. It has consists of two rods one is reference rod and measuring rod. The voltage is given to the reference rod and the conducting current passes to measuring rod. The voltage present in the measuring rod is proportional to the salt content of the water.

E. pH Sensor

pH sensor used to determine the pH value content in the water. The pH value range from the acidity – Neutral – Alkaline. It has two rod to measure the value of the pH value in the water. The pH meter is used for the quality check if water is safe for drinking. A balanced pH level is very important for human health; it should be approximately equal to 7. It gives Full range pH reading from 1 to 5 voltage scale range and gives a Single reading.

CONCLUSION

An internet-based approach to measuring water quality and delivery systems on a real-time basis. The results of the various parameters of water quality are verified that the system achieved the reliability and feasibility of using it for the actual monitoring purposes. The WSN network will be developed in the future comprising of more number of nodes to extend the coverage range. In our proposed system, water level can be monitored continuously from anywhere using web browser. Motor can be controlled automatically full smart automation is achieved. It is a robust system & small in size. This Project use ultrasonic sensors which provide more accurate and calibrated information for water level in tank. An electromagnetic box is used to drop the chlorine power in the tank by automated system and show the various parameter of water in a web browser that can be viewed any where by user.