Monitoring of Hydro Endowment and its Level and Motor Calefact

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Abstract— *Water is indispensable for the living beings, and clean water is critical because of the modern world pollutions into the water in different forms. We can measure and analysethe quality of water in cistern and water level in tank and also the temperature of the motor. The quality of water is analysed by measuring pH because pH determines either the water be acidic or basic and may be salinity, turbidity, microorganism etc., If the water gets filled, then intimation will be sent through the GSM modem and motor will be switched off. Maintaining temperature of the motor is essential as if it get heated then it may get damaged,So we monitor the temperature of the motor.PLC microcontroller is used in the procedure of displaying the result inthe LCD and monitored in website through IOT.*

Keywords—*GSM; LCD; WLTMS;IOT.*

I. INTRODUCTION

Water is used or consumed by living beings in many different ways. Whether it is for a human being or aquatic plants or fishes, the properly maintained water is crucial for the proper sustaina bility. Our project is an extended approach to monitor and control the borewell. We have designed GSM based water level and temperature monitoring system (WLTMS).

The measurement was first carried out by taking each sensor separately. We used LM35 sensor which defines the parameters of the temperature sensor. Analogue output of LM35 is amplified through a process of signal conditioning, where OP-741 is used to amplify the signal. Amplified signal is fed into an ADC for the sake of digital data. This digital data is transferred to an LCD for displaying result. PIC microcontroller is used for this procedure. Modem is also connected to this controller for the wireless communication of the data through GSM technology by receiving an alert through SMS to the concerned authority whose mobile number is specified in the program. In program the threshold value is assigned for pH and temperature sensor (i.e,) 7 for pH 36degree for temperature.The pH value equal to 7 and the temperature less than 36degree Celsius is considered as pure water. If any one of the conditions failed is false is assumed to be polluted water then the message is send to the concerned authority via GSM.This papergives one of the solutions which reduces the wastage of water and usage of temperature sensor result that the lifetime of the motor will exceed for long days. It can be used in the application like storage tank, boilers, borewells etc., to indicate the level of water inside and to indicate before the water level in the tank gets filled.

II.WATER QUALITY PARAMETERS

A) Temperature: If water temperature increases, decreases or fluctuate, these activities may speed up, slow down or stop. Thermoelectric power and heat resistance temperature sensor are most commonly used to detect water temperature.

B) Turbidity: Turbidity is a measure of suspended particles present in water also called as cloudiness of water. It is mainly caused by suspended solids like soil particles and plankton (microscopic plants). Turbidity sensor measures the turbidity level of water by measuring the amount of light scattered at 90 degree.

C) pH : The pH scale ranges from 0 to 14.If pH of a solution is less than 7 then the solution is acidic on the other hand ifpH value is greater than 7 then the solution is basic or alkaline and if pH of a solution is 7 then the solution is neutral. Normal water generally has pH value in between 6 to 9.

III.LITERATURE SURVEY

A) Microcontroller based multi-sensing system for water quality assessment:

The work presents a multi-sensing system based on a dual microcontroller architecture associated with temperature, conductivity and turbidity measurement. The sensor design, implementation and calibration and the multi-sensing system embedded processing and interfacing represent important part of the work. Embedded software was developed for the PIC18F4520 microcontroller using the MPLAB C Compiler for 18MCU from Microchip while the software for data communication, data logging and graphical representation of the WQ data was developed in Lab VIEW.

B) A ZigBee-based Aquiculture Water Quality Monitoring System:

To overcome the issues of many monitoring measurement points, wide range, complex working environment and difficult link in aquaculture monitoring, a low-cost, low-power real-time ZigBee-based water quality monitoring system is presented. The system collects, transmits, displays, queries the water quality parameters (the temperature, dissolved oxygen concentration, pH value, and water level) and controls the increase oxygen machine. The low-power MSP430F149 and CC2530 RF chip are the core of the system which is constituted with the sensor nodes, routing nodes and coordination nodes. The time synchronization algorithm enables all nodes in the network sleep and wake up synchronously to ensure the reliability of data transmission and reduce power consumption. The test results illustrate that the network packet loss rate is 0.83% when the distance between the two nodes is 80 m, which meets the demands of aquiculture. The system runs stably, measures accurately and can automatically regulate the water quality, has certain market value and wide prospects of application.

C) Industrial sewage water quality monitoring system :

The objective of this project is to develop an automatic wireless system to intimate the message to concerned authority when the waste water from industries are mixed with river illegally. Water pollution is a serious problem for the entire world. It threatens the health and well-being of humans, plants, and animals. The main factor of the water pollution is industries which disposes waste water to the river illegally. In early project, the water pollution was detected by chemical test or laboratory test by using this system the testing equipment will be in stationary and samples will be given to testing equipment. In our project the testing equipment can be placed in the river. The parameters involved in the water quality determination such as the pH level, turbidity, dissolved oxygen and Temperature.

D) Water quality sensors calibration system based on reconfigurable fpgatechnology :

An implementation of a reconfigurable FPGA (Field-Programmable Gate Array) is proposed for digital control and acquisition tasks associated with a water quality sensor calibration system. The system permits the water quality (WQ) sensor auto-calibration based on FPGA control of different actuators (pumps and electrovalves) and of WQ data sensor acquisition, real time WQ data processing based on real-time controller capabilities and wireless data communication. Elements related with the power consumption of the calibration system are also presented.

E) Real-Time Sensing Channel Modelling Based on an FPGA and Real-Time Controller:

This paper presents the concept of reconfigurable sensing channel characteristics inverse model in auto-calibration measurement systems, particularly for water quality measuring systems. The inverse model implementation is supported on an advanced FPGA reconfigurable embedded control and acquisition system (CompactRIO). Model blocks, such as polynomial and neuronal, are on-line updated (reconfigured) in the cRIO real time controller using calibration data while the on-line processing of the measured physical quantities (e.g. water quality quantities: conductivity) are mainly processed by the RIO FPGA core.

IV. PROPOSED SYSTEM

In traditional method, water parameters are detected by collecting samples manually and then send them to the well equipped laboratories for further analysis where the testing equipments are stationary and samples are provided to the testing equipments. In order to overcome above mentioned disadvantages there is need to have autonomous, low cost, reliable and flexible water quality measurement system.

Various advanced technologies for measuring water quality have been proposed in the recent years. A sensor based wireless water quality monitoring system is proposed in which the data from monitoring sensors is send to the Microcontroller board consisting of Arduin microcontroller and then sent to the IOT board to display on the IOT page. In the bore well, water level sensor is used to measure the level of the water in the bore well. If the water gets filled, then intimation will be sent through the GSM modem and motor will be switched off. Temperature sensor is used here to measure the motor temperature, if it reaches more than the assigned level, then the motor will be switched off. PH sensor is used to measure the water quality.The pH value equal to 7 and the temperature less than 36 degree Celsius isconsidered as pure water otherwise it is assumed to be polluted waterthen the message is send to the concerned authority via GSM.The temperature and WQ quantities can be viewed inLCD& monitoredAll these qualities can be viewed in LCD and monitored in website through IOT. All these qualities can be viewed in LCD and monitored in website through IOT.

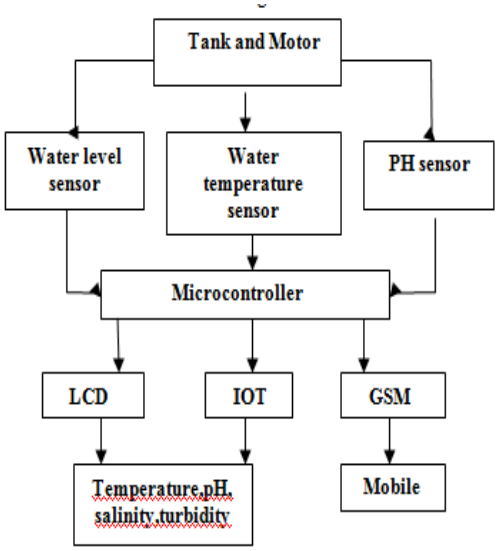

Figure4.1

A) Level Sensor : Level sensors detect the level of liquids and other fluids and powders that exhibit an upper free surface. Substances that flow become essentially horizontal in their containers (or other physical boundaries) because of gravity whereas most bulk solids pile at an angle of repose to a peak. There are many physical and application variables that affect the selection of the optimal level monitoring method for industrial and commercial processes. The selection criteria include the physical: phase (liquid, solid or slurry), temperature, pressure or vacuum, chemistry, dielectric constant of medium, density (specific gravity) of medium, agitation (action), acoustical or electrical noise, vibration, mechanical shock, tank or bin size and shape

Figure(4.2)

B) Temperature Sensor : The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling.

The LM35 device does not require any external calibration or trimming to provide typicalaccuracies of ±¼°C atroom temperature and ±¾°C over a full −55°C to 150°C temperature range. The low-output impedance, linear output, and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy.

Temperature Sensor
Figure (4.3)

C) Ph Sensor : A ph sensor is a device that measures the hydrogen-ion concentration (ph) in a solution, indicating its acidity or alkalinity. In addition to measuring the ph of liquids, it can also measure the moist and light level. The ph sensor has an inbuilt meter to measure the light intensity. The ph sensor is connected with a board to get a digital input.

PH Sensor
Figure (4.4)

D) IOT Board: IoT has evolved from the convergence of wireless technologies, micro-electromechanical systems (MEMS) and the Internet. The concept may also be referred to as the Internet of Everything. The internet of things (IoT) is the internetworking of physical devices, vehicles, buildings and other items— embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

IOT Board
Figure (4.5)

E) GSM Modem: This GSM Modem can work with any GSM network operator SIM card just like a mobile phone with its own unique phone number. Advantage of using this modem will be that its RS232 port can be used to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily using this.

GSM Modem
Figure(4.6)

V. RESULT ANALYSIS

The test results show that the system can accurately capture water quality parameters. The data transmission in the wireless sensor network is stable and reliable, which meets the requirements.

Table 5.1

monitoring point	Temperature (℃)	pH value	dissolved oxygen(mg/L)
1	21.4	7.3	6.6
2	21.2	7.3	6.7
3	21.2	7.5	6.6
4	20.9	7.4	6.5

VI. CONCLUSION

Water quality measurement system measures the parameters of water like pH quality of water for deciding whether it is safe for drinking or not. Apart from that the motor temperature is also monitored in order to prevent it from damage. Along with it water level is also monitored to prevent the wastage of the water. This technique is efficient, economical, convenient and fast than the traditional method. The sensor based system also has good flexibility as only by replacing sensors and small change in software programming this system can be used for measuring water quality parameters with all the relevant parameters as per the applications in industry or agriculture.

The future enhancement is focused on improving the application by converting the impure water which was deducted by pH sensor into pure water and reusing it using some methodology.

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