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Design & Control Smart Automatic Water Monitoring System

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Abstract—this paper presents a system framework taking the advantages for the real-time monitoring on the water quality in aquaculture. We design the structure of the wireless sensor network to collect and continuously transmit data to the monitoring software.The discharge of wastewater effluents untreated or equally treatment without periodic quality monitoring, can lead to catastrophic water pollution in the long term affecting the aquatic life, agriculture farming and soil conditions of the entire downstream ecosystem.Moreover, the monitoring software developed to represent the monitoring hardware and data visualization, and analyze the data with expert knowledge to implement the auto control.The monitoring system has been realization of the digital, intelligent, and effectively ensures the quality of aquaculture water. Practical deployment results are to show the system reliability and real-time characteristics, and to display good effect on environmental monitoring of water quality.

Keywords—*Water quality, PH Sensor, Turbidity Sensor, Temperature Sensor, Ethernet.*

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I. INTRODUCTION

Over the previous decade, online water quality monitoring has been broadly utilized as a part of numerous nations known to have major issues identified with ecological Contamination

The drinking water is all the more valuable and profitable for all the individuals so the nature of water thought to be observed continuously. These days water quality monitoring continuously confronts challenges as a result of an unnatural weather change, restricted water assets, developing populace, and so on. Henceforth, there is a need of growing better approaches to screen the water quality parameters progressively, in India among 77 million individuals is enduring due to not having safe water. WHO (world wellbeing association) likewise gauges that 21% of maladies are identified with dangerous water in India. Additionally, more than 1600 passing's alone cause because of looseness of the bowels in India day by Day.

For example, broke down oxygen (DO), conductivity, pH, turbidity and temperature thought to be checked continuously, The conventional techniques for water quality screen include the manual gathering of water test from various areas.

These water tests tried in the research facility utilizing the expository innovations. Such methodologies are tedious and didn't really to be viewed as proficient. In addition, the momentum strategies incorporate investigation of differentsorts of parameters of water quality, for example, physical and compound. In this framework the deliberate information of water qualitychecking sensors are gathered by the information pack which offers information to the information preparing unit through GSM modem.

II. HARDWARE AND SOFTWARE REQUIRMENT

A. **Hardware :**

- MCU (Microcontroller Unit-16F887 /16F4620)
- Sensor (PH , Turbidity , Temperature Sensor)
- Valve Driver
- Tank Water Mixing Motor

B. **Software:**

- My SQL
- Java
- Android (Android Studio)
- Embedded C(For MCU)

HARDWARE

MICROCONTROLLER

a) MCU 16F887

This powerful yet easy-to-program (only 35 single word instructions) CMOS FLASH-based 8-bit microcontroller packs Microchip's powerful PIC® architecture into an 40- or 44-pin package.The PIC16F887 features 256 bytes of EEPROM data memory, self-programming, an ICD, 2 Comparators, 14 channels of 10-bit Analog-to-Digital (A/D) converter, 1 capture/compare/PWM and 1 Enhanced capture/compare/PWM functions, a synchronous serial port that can be configured as either 3-wire Serial Peripheral Interface (SPI™) or the 2-wire Inter-Integrated Circuit (I²C™) bus and an Enhanced Universal Asynchronous Receiver Transmitter (EUSART). All of these features make

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it ideal for more advanced level A/D applications in automotive, industrial, appliances or consumer applications.

Image of MCU 16F887

SENSORS :

1) pH SENSOR

Image of pH sensor

Scientific pH sensors measure the level of pH in sample solutions by measuring the activity of the hydrogen ions in the solutions. This activity is compared to pure water (a neutral solution) using a pH scale of 0 to 14 to determine the acidity or alkalinity of the sample solutions.

2) TURBIDITY SENSOR

Image of turbidity sensor

Global Water's Turbidity Sensor is a highly accurate submersible instrument for in-situ environmental or process monitoring. Applications for the turbidity sensors include: water quality testing and management, river monitoring, stream measurement, reservoir water quality testing, groundwater testing, water and wastewater treatment, and effluent and industrial control.

3) TEMPRATURE SENSOR

Image of temp sensor

The LMT01 device is a high-accuracy, 2-pin temperature sensor with an easy-to-use pulse count current loop interface, which makes it suitable for onboard and offboard applications in automotive, industrial, and consumer markets. The LMT01 digital pulse count output and high accuracy over a wide temperature range allow pairing with any MCU without concern for integrated ADC quality or availability, while minimizing software overhead. TI's LMT01 device achieves a maximum ±0.5°C accuracy with very fine resolution (0.0625°C) over a temperature range of –20°C to 90°C without system calibration or hardware and software compensation.

WORK IN PROGRESS

Thus, we have to create circuit that can be connected to the sensor. It can convert the 230 volt into the 5 volt by using the resister, capacitor, brig rectifier. The microprocessor can connected through circuit & it will be transfer the command to valve circuit. The valve circuit are control the valve process in the tank. The Ethernet can also connect to the circuit for stored data or information in database.

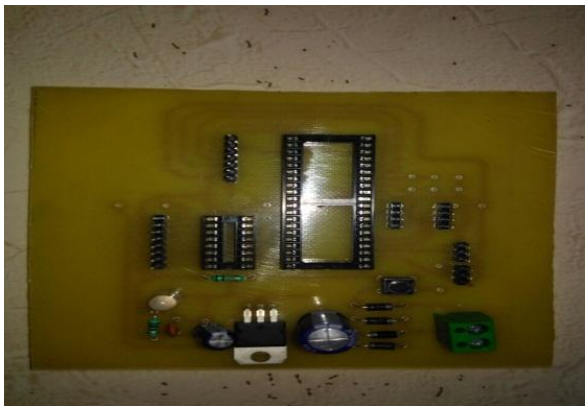

Image of Main Circuit

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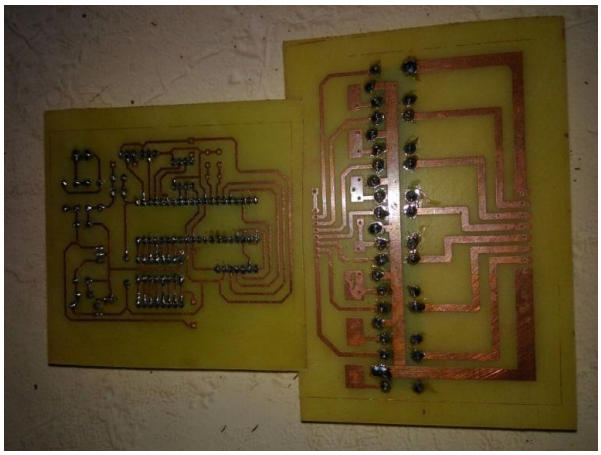

Image of Main Bus Circuit & Valve Bus Circuit

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