

Reconfigurable Smart Water Quality Monitoring System in IoT Environment

ABSTRACT

The effective and efficient system of water quality monitoring (WQM) are critical implementation for the issue of polluted water globally, with increasing in the development of Wireless Sensor Network (WSN) technology in the Internet of Things (IoT) environment, real time water quality monitoring is remotely monitored by means of real-time data acquisition, transmission and processing. This paper presents a reconfigurable smart sensor interface device for water quality monitoring system in an IoT environment. The smart WQM system consists of Field Programmable Gate Array (FPGA) design board, sensors, Zigbee based wireless communication module and personal computer (PC). The FPGA board is the core component of the proposed system and it is programmed in very high speed integrated circuit hardware description language (VHDL) and C programming language using Quartus II software and Qsys tool. The proposed WQM system collects the five parameters of water data such as water pH, water level, turbidity, carbon dioxide (CO₂) on the surface of water and water temperature in parallel and in real time basis with high speed from multiple different sensor nodes.

EXISTING SYSTEM

In olden days usually water is contaminated by several reasons. There are no specific ways to check the quality of drinking water. Years after that some techniques are introduced to check the quality of water and there by purifying the water .The equipment cost is high and takes more time. We have to check the water quality manually and we are not getting any alerts. Now a days water is contaminated more because of the pollution. So with the advancement of technology we are using many techniques to check quality of water. One major technique is by using IoT.

DRAWBACKS

- It takes lot of time.
- Equipment cost is high.
- We are not getting any indication about the quality of water.

PROPOSED SYSTEM

The effective and efficient system of water quality monitoring (WQM) are critical implementation for the issue of polluted water globally, with increasing in the development of Wireless Sensor Network (WSN) technology in the Internet of Things (IoT) environment, real time water quality monitoring is remotely monitored by means of real-time data acquisition, transmission and processing. This paper presents a reconfigurable smart sensor interface device for water quality monitoring system in an IoT environment. The smart WQM system consists of Field Programmable Gate Array (FPGA) design board, sensors, Zigbee based wireless communication module and personal computer (PC). The FPGA board is the core component of the proposed system and it is programmed in very high speed integrated circuit hardware description language (VHDL) and C programming language using Quartus II software and Qsys tool. The proposed WQM system collects the five parameters of water data such as water pH, water level, turbidity, carbon dioxide (CO₂) on the surface of water and water temperature in parallel and in real time basis with high speed from multiple different sensor nodes.

ADVANTAGES

- Takes less time in detection of water quality.
- Cost is also less.

SYSTEM REQUIREMENTS

H/W System Configuration:-

- Processor - Pentium –IV
- RAM - 4 GB (min)

- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor - SVGA

S/W System Configuration:-

- Operating System : Windows 7 or 8 32 bit
- Application Server : Tomcat5.0/6.X
- Programming Language : Java
- Java Version : JDK 1.6 and above