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European Journal of Advances in Engineering and Technology, 2022, 9(4s):503-507
International Conference on Tech Trends in Science & Engineering (ICTTSE) 2022
Suryodaya College of Engineering & Technology, Suryodaya Polytechnic, Nagpur, Maharashtra, India

Research Article ISSN: 2394 - 658X

Output on Smart Water Managment

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ABSTRACT

This paper presents an IOT device which helps to Manage and plan the uses of water. This system is can be easily Installed in residential societies. The sensors placed in the tank which continues inform the level of water present in tank. This information displays on the lcd screen. According to the level of water in the tank motor functioning will be Automatically controlled , At low level of water motor will turn on and when tank will fill up the motor is off and this process will repeat.

Key words: Ultrasonic Sensor, Ardino Mega Boad, Buzzer, Lcd, Ds18b20, Flow Meter, Water Management.

INTRODUCTION

Water is the most significant overabundant compound of the earth. Water is life, no life can lie without water. Water is used in different sectors like domestic, agriculture and industry. In the mean-time the drink is much appreciated by everyone. In recent times very low water levels and water within the ponds have occurred. It is therefore of the utmost importance to seek a response to water and system monitoring. IoT can be the solution. In recent days, advances in computer and electronic technology have created the IoT technology. The IoT is always defined because of a network of electronic devices to communicate with each other with the help of an administrator. IoT can be a collection of devices that rent together to help people work efficiently. It includes computational power to send data about a location. These tools typically perform sensor type, instrumentation, implanted systems, and analysis of data with microchips. In this article represents the design and production of a lower cost monitoring system, which is likely results of water and quality of water expenditure. Sensors and Microcontroller are used in a system. The „Ultrasonic Sensor" can employed in determining the water level. Conflicting parameters such as Temperature, pH, and water Turbidity are often observed using the corresponding linear sensors. This process uses a flow sensor that can compute the flow of water and when required amount of water flows through the pipes, then the flow of water is usually automatic. Target values from sensors are typically handled by the microcontroller and downloaded to the web via. Wi-fi module (ESP8266). For enquiry we will treat processes, what part of the water is used at a particular time, day or month. Alters message and sensor generated data are transmitted to the web on a cloud server and may be accessed by non-users. The most commonly found sensory information is displayed on the web and provides display locations through a mobile phone or web application. The authors discussed a smart water monitoring system based on IoT that determine water quality in real-time. The model has taken into account the fact that water quality is usually a factor when flooding exclusively in tragedy areas. Ultrasonic Sensor is used to invoke a specified factor and when, the water level reaches the parameters, the signal should be transmitted while on a social network such as Twitter. The author and co-workers suggested that in recent

times, the best growth through the Web of things is seen in smart homes. A vast variability of alternative IoT systems often create collaborative that needs to be achieved. The IoT techniques is delivered using wireless determining policies. It is proposed to establish facilities that use Forum-Condition-Action (ECA) to resolve in-house IoT management in smart homes. The creation of a functional architecture, developed by advanced data warehouses that store IoTs schema data, has been the ultimate solution for determining interoperability in smart homes. This article suggested that the quality of the drink should be monitored in real-time. During the paper, we introduce the designs and implementation of a standard system for monitoring real-time IoT water quality. The system contains many sensors that cannot measure water and chemical parameters. Saima Maqbool and Nidhi Chandra (2013) shows how to monitor the „water quality of water systems" such as rivers, ground water and livestock slightly. It's also showed how to handling the pump performance automatically and remotely. It is often far more likely to remotely monitor affected areas such as floods without the information and information that is usually sent to the mobile. this method is intended to monitor water quality with the comfort of water level sensors. Water pollution and shortage of water are globally problems, requiring ongoing policy change to guide international water resources at specific wells. It has been studied that pollution is the prominent definition of disease worldwide. Records display that over thousands of people die every day in worldwide. In India, 500+ people die from complications associated with daily pollution. Studies have shown that after a few years the amount of auxiliary water will decrease. In several developed countries, wastewater is not used for drinking purpose. The explanations for this often due to management and public ignorance and hence the deficiency of water quality monitoring system that indicates universal issues. And environmental impacts like algae tints, volcanoes, and earthquakes are also changing the environment and water.

LITERATURE SURVEY

Design of a Water Environment Monitoring System Based on Wireless Sensor Networks: This paper is devoted to the explanation and illustration of our new design of water environment monitoring system, based on a wireless sensor network. The system generally includes three parts: hardware and software of data monitoring nodes, hardware and software of the data base station, and software for the remote monitoring centre. The system's measurement capacity ranges from 0 to 80 C on water temperature, with an accuracy of 0.5C; and from 0 to 14 on pH value, with an accuracy of 0.05. Sensors, applicable to different water quality, could be installed at the node to meet the monitoring demands in different water environments and to obtain different parameters. Smart Water Monitoring System Using Wireless Sensor Network at Home/Office: This paper is about developing an efficient wireless sensor network (WSN) based on water monitoring system. There are two different ways to monitor the water: water level monitoring and water pipeline leakage monitoring. Finally, this is water monitoring system of smart homes/office research concept will be completed by using wireless sensor technology. By using the monitoring system, we can find a more optimal way to preserve the water, hence saving it for the present and the future generations. Water Quality Monitoring System Using Node MCU Based Wireless Sensor Network: Here, the proposed implementation of high power Node MCU based WSN for water quality monitoring system offering low power consumption with high reliability is presented. An important fact of this system is the easy installation of the system, where the base station can be placed at the local residence, close to the target area. And the monitoring task can be done by any person with minimal training at the beginning of the system installation.

SYSTEM ARCHITECTURE

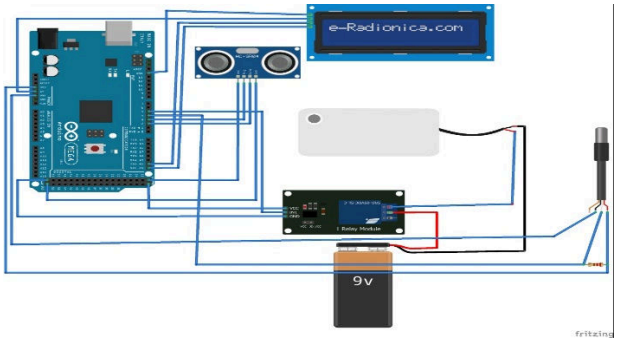

Fig. 1

METHODOLOGY

A. Arduino Mega

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various development boards (shields) and other circuits. The board has 14 digital I/0 pins (six capable of PWM output), 6 analog I/0 pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery. It also has 16 MHz ceramic resonators, a USB connection jack, an external power supply jack, an ICSP (incircuit serial programmer) header and a reset button. Its operating voltage is 5v, input voltage 7 to 12v (limit up to 20v)

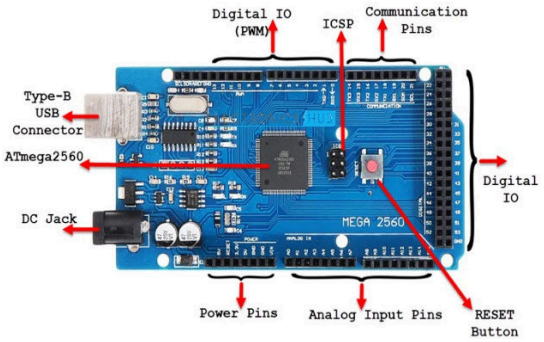

Fig. 2 Arduino UNO Pin Description:

B. Relay Module

The Relay module is a distinct hardware device used for remote switching. The Relay module houses two SPDT relays and one wide voltage range, optically isolated input. These are brought out to screw-type terminal blocks for easy field wiring. Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. As relay diagram show, when a relay contact is normally open (NO), there is an open contact when the relay is not energized. Here we are using 4 channel 24V relay as we are controlling the 5 led panel there for optimizing the load 4 channel relay is best way to handle it.

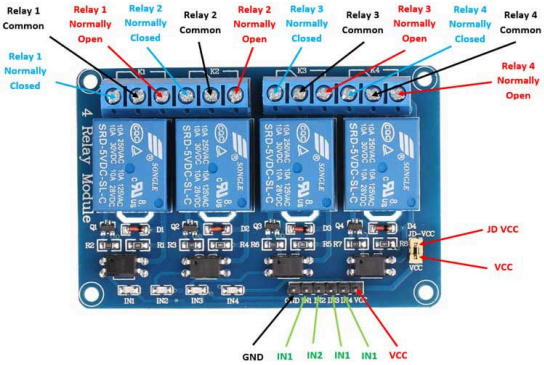

Fig. 3

C. YF-S201 Hall-Effect Water Flow Sensor

Fig. 4 Hall-Effect Water Flow Sensor

This sensor can be connected to the waterline as it has both inlet and outlet. Inside the sensor, there is a pinwheel that measures how much liquid has moved through it. There's an integrated magnetic hall effect sensor that outputs an electrical pulse with every revolution.

The sensor comes with three wires:

1.Red ***(5-24VDCpower)***

2.Black ***(ground)***

3. Yellow ***(Hall effect pulse output)***

The water flow rate can be calculated by counting the pulses from the output of the sensor. Each pulse is approximately 2.25 milliliters. This Sensor is cheaper and best but not the accurate one as flow rate/volume varies a bit depending on the flow rate, fluid pressure, and sensor orientation. To get better precision of more than 10%, a lot of calibration is required. You can make a basic IoT Based Water Flow Meter using this Sensor.

D. Ultrasonic Sensor

The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy-to-use package from 2 cm to 400 cm or 1" to 13 feet. The operation is not affected by sunlight or black material, although acoustically, soft materials like cloth can be difficult to detect. It comes complete with ultrasonic transmitter and receiver module. The ultrasonic sensor uses the reflection of sound in obtaining the time between the wave sent and the wave

received. It usually sent a wave at the transmission terminal and receive the reflected waves. The time taken is used together with the normal speed of sound in air to determine the distance between the sensor and the obstacle. The Ultrasonic sensor has been used by several researchers [25,26] to sense the movements of the objects as they approach it.

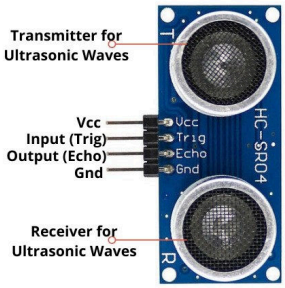

Fig. 5

E. LED Display

A typical LCD display consists of 16 pins that control various features of the screen. The Arduino microcontroller can output voltages of either 5 V or 3.3 V, so the LCD can be powered by wiring VSS and VDD to the ground and 5 V pins on the microcontroller.

Fig. 6

It is possible to adjust the contrast of the screen by wiring a variable resistor to V0 located at pin 3 on the screen. The RS, R/W, and E pins are wired to pins 12, ground, and 11 respectively on the Arduino. The LCD 5 screen can operate in both 8-but mode and 4-bit. For this application note only 4-bit mode will be discussed, as it requires fewer pins and is generally easier to use. To interface with the LCD in 4-bit mode the Arduino only needs to be connected to pins DB4-DB7, which will connected to digital output pins 5-2 respectively. Pins 15 and 16 on the LCD screen are used to power a backlight in the screen. This makes text displayed in the screen easier to read in poorly lit environments and is optional. In order to power the backlight pin 15 should be connected to ground while pin 16 should be connected to the 5 V output

of the Arduino. To power the Arduino a 9 V battery can be connected to the VIn and ground pins on the Arduino. If such power source is available the Arduino can be powered by using its USB connection with a computer.

F. Buzzer

A buzzer is an audio signaling device driven by an electronic circuit. It reacts to asmall energy input by emitting a high sound output

Fig. 7

G. DS18B20

The DS18B20 is one type of temperature sensor and it supplies 9-bit to 12-bit readings of temperature. These values show the temperature of a particular device. The communication of this sensor can be done through a one-wire bus protocol which uses one data line to communicate with an inner microprocessor. Additionally, this sensor gets the power supply directly from the data line so that the need for an external power supply can be eliminated. The applications of the DS18B20 temperature sensor include industrial systems, consumer products, systems which are sensitive thermally, thermostatic controls, and thermometers.

Fig. 8

FUTURE WORK

It is widely acknowledged that there are fundamental flaws in the nation's water and wastewater management infrastructure (pipe systems, facilities, and equipment) that result in environmental damage and the loss of millions of gallons of water every year. Labor-intensive meter reading and the lack of visibility into distribution, collection, and consumption patterns result in time-consuming, costly, and reactive services. To minimize these losses, and to address mounting concerns about drought, flooding, and water quality, the water industry is now adopting advanced sensor and communications solutions designed specifically for "smart" Internet of Things (IoT) water management. In large part, the move toward implementing smart water solutions is being driven by stricter government compliance requirements, the evolution of smart cities, and the need for water conservation in agriculture and other heavy water use markets.

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