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Real time monitoring of waste water production in the dying industry

T Manoj Kumar, G Arun Kumar, D Jenifer, N Naveen Kumar and

Mr.G Rathanasabhpathy., M.E.,

Department of Electronics and Communication Engineering, Nandha Engineering College, Erode, India.

ABSTRACT

This project mainly deals with several pollution control measures existing in industries. The water pollution is major problem with our day to day life. To avoid this pollution is a challenging role at our society. This project proposes a water pollution level at the industries which is mixed at the river side. It causes many problems in the environment. For this, the Arduino UNO is used along with moisture sensor. With the rapid development of global system mobile infrastructure and information communication technology in the past few decades has made the communication is reliable for transmitting and receiving information efficiently. ESP8266 WI-FI module is used for efficient communication purpose. The purity of water content released from the industry is checked through moisture sensor and the unwanted gas is detected by the gas sensor. The utilization of any human beings in the restricted area is also identified through IR sensor. The message about the polluted water is sent to the control board and also the owner of the dying industry. If the water from the dying industries is polluted means the solenoid valve is automatically closed. This paper helps in neglecting those factors affecting the human environment through pollution.

EXISTING METHOD

In the existing method, there is a miniaturized bacteria-based bio sensing platform for sensitive, reliable and practical on-line monitoring of water quality. Two biosensors were integrated into a dual-channel microfluidic device which operated as a detection and a reference sensor, respectively. By providing a reference-compensated sensing response, the device was capable of minimizing environmental interferences such as temperature and flow rate, ultimately leading to high sensitivity and reliability in water quality monitoring [1-5].

Drawbacks of existing system

The existing method monitors the quality of drinking water. There is no communication to the government about the waste water from industries. In the existing method automatic closing valves are not presented. Water pollution occurs at many places like processing mills, industries etc., Health problem

induced by the polluted water. Water pollution is the major reason to reduce the quality of water [6-10].

Proposed method

This project mainly deals with several pollution control measures existing in industries. The water pollution is major problem with our day to day life. This paper helps in neglecting those factors affecting the human environment through pollution. The purity of water content released from the industry is checked through a moisture sensor. In this project, the Arduino UNO plays a major role to detect the polluted water from the industry. The sensors like gas sensor which is used to detect the unwanted gas in the industries and ESP8266 WI-FI module helps to sends the message to the control board. The IR sensor is used to detect the utilization of any human beings in the restricted areas. This project helps to avoid the environmental problems through the industries waste water.

Arduino UNO

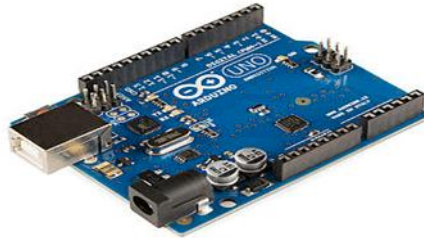


Fig 1: Arduino UNO

Arduino UNO is an open source micro controller 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 expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O 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, though it accepts voltages between 7 and 20 volts. It is also similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

Moisture sensor

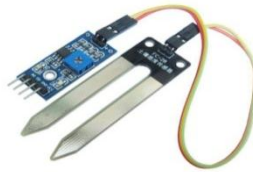


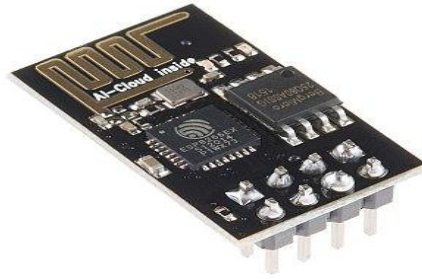
Fig 2: Moisture sensor

The Moisture sensor is used to measure the water content (moisture). When the soil is having water shortage, the module output is at high level, else the output is at low level. This sensor reminds the user to water their plants and also monitors the moisture content of soil or any other mixtures. It has been widely used in agriculture, land irrigation and botanical gardening.

ESP8266

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by manufacturer Expressive Systems in Shanghai, China. The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party

manufacturer Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first there was almost no English-language documentation on the chip and the commands it accepted.¹ The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation. The ESP8285 is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.

**Fig 3: ESP8266**

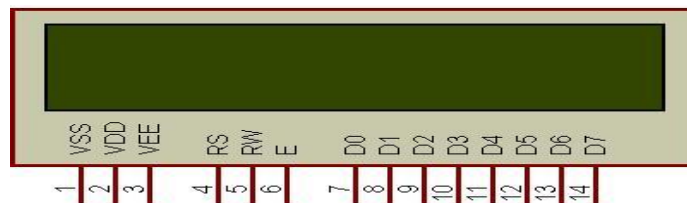
IOT

Connecting everyday things embedded with electronics, software, and sensors to internet enabling to collect and exchange data without human interaction called as the Internet of Things (IoT). The term "Things" in the Internet of Things refers to anything and everything in day to day life which is accessed or connected through the internet.

LCD display

LCD stands for liquid crystal; this is a output device with a limited viewing angle. The choice of

LCD as an output device was Because of its cost of use and is better with alphabets when compared with a 7-segment LED display. We have so many kinds of LCD today and our application requires a LCD with 2 lines and 16 characters per line, this gets data from the microcontroller and displays the same. It has 8 data lines, 3 control line, a supply voltage Vcc. This makes the whole device user friendly by showing the balance left in the card. This also shoes the card that is currently being used.

**Fig 4: LCD display**

Buzzer

**Fig 5: Buzzer**

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses

of buzzers and beepers include A buzzer or beeper (BUZZERS) is a signaling device, usually electronic, typically used in automobiles,

household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound.

IR sensor

IR sensor is a simple electronic device which emits and detects IR radiation in order to find out

certain objects/obstacles in its range. Some of its features are heat and motion sensing. IR sensors use infrared radiation of wavelength between 0.75 to $1000\mu\text{m}$ which falls between visible and microwave regions of electromagnetic spectrum. IR region is not visible to human eyes. Infrared spectrum is categorized into three regions based on its wavelength i.e. Near Infrared, Mid Infrared, Far Infrared.



Fig 6: IR sensor

Gas sensor

A gas sensor is a device which detects the presence or concentration of gases in the atmosphere. Based on the concentration of the gas

the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. Based on this voltage value the type and concentration of the gas can be estimated.



Fig 7: Gas sensor

Relay_unit

Relays are components, which allow a low power circuit to switch a relatively high current

ON and OFF, or to control signals that must be electrically isolated from the controlling circuit itself.

Solenoid valve

The illustration below depicts the basic components of a solenoid valve. The valve shown in the picture is a normally-closed, direct-acting

valve. This type of solenoid valve has the most simple and easy to understand principle of operation.

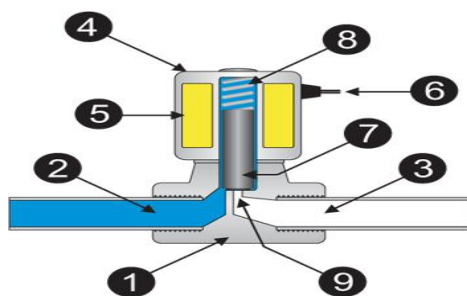


Fig 8: Solenoid valve

1. Valve Body	4. Coil / Solenoid	7. Plunger
2. Inlet Port	5. Coil Windings	8. Spring
3. Outlet Port	6. Lead Wires	9. Orifice

OPERATION OF THE PROPOSED SYSTEM

The project works under the concept of embedded systems. The project is fixed in the outlet pipe of the dying industries. If the water from the dying industries is highly polluted means the solenoid valve is automatically closed and also the message is passed to the control board using ESP8266 WI-FI module. GAS sensor and IR sensor also fixed for the safety issues inside the industries. GAS sensor is used to detect the unwanted gas in the industries and it gives the alert

message to the workers. IR sensor is used to detect the high level of chemicals in the boilers and also give the alert message to the workers through the buzzer. LCD display is used to display the pollution level of the water from the dying industries. Moisture sensor is used to detect the water level of the industries. The utilization of any human beings in the restricted area is also identified through IR sensor. This paper helps in neglecting those factors affecting the human environment through pollution.

Output for the proposed system



Fig 8: Output for the proposed system

Advantages

- Error reduction
- Reduced pollution and intimate to control board
- Prevents diseased from polluted air

Application

- This project can be used to avoid the water pollution
- It can be used in processing mills
- It can be used at drinking water purifying process

CONCLUSION

From the above discussion and information of this system, it is clear that this system is highly reliable, effective and economical. The proposed

system is based on embedded and IOT technology to know the polluted level of water content from the dying industries. In this project, the solenoid valve is automatically closed when the chemical content of the water is cross its certain limits and the message is passed to the control board. By the application in the mobile it is easy to monitor the status of the outlet water from the industries.

FUTURE SCOPE

This project 'REAL TIME MONITORING OF WASTE WATER PRODUCTION IN THE DYING INDUSTRY' is implemented in both hardware and in mobile phone. In future, this project will be implemented purely in mobile phone and it can reduce the water pollution.

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