

Automatic Indication of Industrial Monitoring And Pollution Detection Using IOT

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Abstract- Internet of things is a growing technology which is used all over the world. IoT is used to connect the devices to the internet or network and it is a combination of embedded system and communication system. The data transmission and reception is made using IoT. In this paper, the system is used to monitor and detect the pollution by implementing the standard protocols using IoT. The water and air pollution is detected by the sensors with a threshold value. It can be wirelessly monitored by mobiles, laptops.

Keywords- arduino, gas sensor, ph sensor, temperature sensor, humidity sensor.

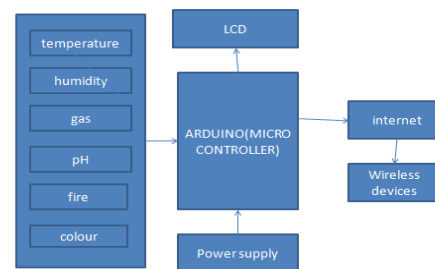
I. INTRODUCTION

Now days, industrial monitoring has vital role in industrial area to monitor and control the equipments in the industry. Industrial monitoring is used for fast processing, minimization of power consumption, used to improve quality, low cost systems of industry. There are lot of methods that are available to monitor and control industrial processes like zigbee PLC-SCAD, WSN, Internet of things(IOT) etc. Now days,"internet of things" is most favorable technique for industrial process monitoring. IoT is combination of embedded system and communication system in which industrial equipments are connected to internet with the help of wireless sensor network and devices or industrial application can monitor and control through mobiles and laptops.

The major issues that are affecting the environment in various ways are the water pollution and air pollution. Animals, plants, humans have many health issues only because of the water pollution and air pollution. Indoor air pollution(like industry) is considered to have most toxic kind of pollution. Each devices in a industry is monitored with its threshold values. The polluted water and air is very harmful for the humans health and the environment. When there is a pollutants in the atmosphere there may even be a cause of acid rain, climate change, global warming. In this paper, the system

is used to prevent the air pollution and water pollution in the industry.

II. ARCHITECTURE AND WORKING THEORY

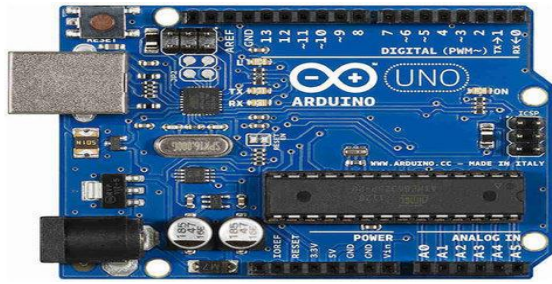


The system is used to monitor and detect pollution in the industries. The arduino is used as a microcontroller. Where the data is stored with the threshold value. The temperature and humidity sensor is used to prevent the machines from damage in industries. Where the machines get damaged once when there is high or low temperature or humidity level in the atmosphere of industries. The gas sensor is used to sense the gas level in the industry, whereas it detect the leakage of harmful gases in industry. The pH sensor is used to check the water ,if treated or not treated. The fire sensor with an alarm is used in order to avoid the fire accidents. The color sensor is used to define the color of the product in the process of manufacturing.

The LCD display is used to monitor the values of pH, temperature, gas and humidity level in the industry .The sensors are continuously monitored and the data is displayed on the LCD or message is even received through the wireless devices. A buzzer is triggered in case of any emergency or warning.

III. HARDWARE MODULES USED

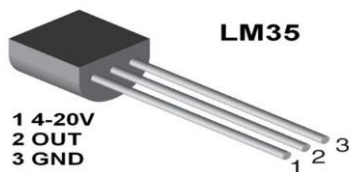
1. Arduino(ATMEGA328p):



The Arduino Uno is a microcontroller which is based on the ATmega328. Arduino is classified with 14 digital input/output pins, 6 analog inputs, a 16 MHz ceramic resonator. It also has a USB connection, along with a power jack, an ICSP header, and a reset button. It supports the microcontroller to be simply connected to a computer with a USB cable or battery to get started. The Uno differs from all preceding boards and does not use the FTDI USB-to-serial driver chip.

2. Temperature sensor

Temperature sensor is a thermocouple or a resistance temperature detector (RTD) that gathers the temperature from a specific source and alters the collected information into understandable type for an apparatus or an observer. Temperature sensor is used in several applications like environmental controls, medical devices, food processing units, chemical handling, controlling systems, automotive under the hood monitoring and etc. The most frequent type of temperature sensor is a thermometer, used to determine the temperature of solids, liquids, and gases. It is mostly used for non-scientific purposes as it is not so accurate. The different kinds of sensors are categorized by the sensing capacity of the sensor as well as the range of applications.



3. Humidity Sensor

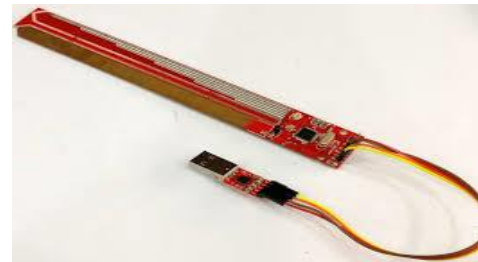
A humidity sensor is used to measure the moisture in the atmosphere. Relative humidity is the presence of high moisture in the air at a atmosphere. Relative humidity is an important factor, to avoid the risks.



Humidity sensors work by detecting changes that alter electrical currents or temperature in the air. There are three basic types of humidity sensors they are capacitive, resistive and thermal. All these three types of sensors monitor minute changes in the atmosphere in order to calculate the humidity in the air.

4. pH Sensor

One of the most commonly used water quality measurements taken is pH. pH is a measure of how acid or alkaline water is, but this is actually determined by the amount of free hydrogen and hydroxyl ions in the water. Water that has more free hydrogen is acidic, whereas water that has more free hydroxyl ions is alkaline.



5. Gas sensor

To detect the presence or concentration of gases in the atmosphere we use the gas sensor. The concentration of the gas the sensor produces a corresponding potential difference which changes the resistance of the material inside the sensor, and it can be measured as output voltage. Based on the voltage value the type and concentration of the gas can be estimated.

MQ-6 Gas Sensor



This type of gas sensor could detect harmful gas on the sensing material present inside the sensor. Gas sensors are available as the modules with comparators. The comparators are set for a particular threshold value of gas concentration. When the concentration of the gas exceeds the threshold digital pin goes high. The analog pin are used to measure the concentration of the gas.

6. Fire Sensor

A flame detector is a sensor designed to detect and respond to the presence of a flame or fire, allowing flame detection. Responses to a detected flame depend on the installation, but can include sounding an alarm, deactivating a fuel line, and activating a fire suppression system.

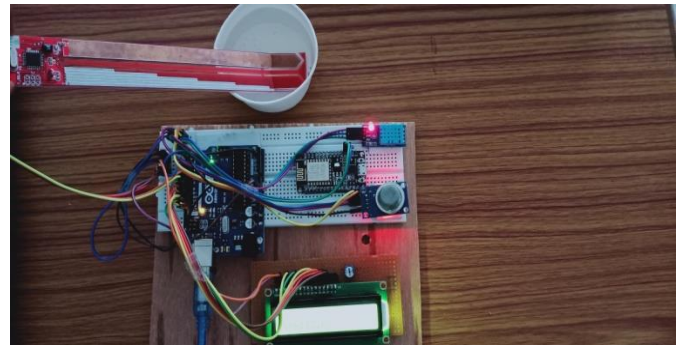


7. Colour Sensor

A Colour Sensor, as the name suggests, is a device that senses or detects colours. A color sensor will use an external means of emitting light (like an array of white LEDs) and then analyse the reflected light from the object in order to determine its colour.



Proposed system: The industries is monitored by the temperature and humidity sensor in order to prevent the machines from damage. The ph sensor is used to detect the pollution whereas it measures whether it is a treated or untreated water from the industry. The gas sensor is used to detect the leakage of harmful gas in the industry. The color sensor is used to detect the color of the product in the process of manufacturing. The fire sensor is used to avoid the fire accidents in the industries. whereas the range of temperature, humidity, gas and ph sensors is continuously monitored in the wireless devices like mobile and laptops. The values are even monitored in the lcd display ,the pollution is controlled by this method.



IV. CONCLUSION

This paper has presented the design and implementation of Internet of things for monitoring and controlling of various application and parameters in industries using wireless communication technique, where the data is received in the handphones or laptops. The key idea of the proposed work is to provide flexible long distance connectivity between industrial environment and user. The advantages of the developed system are to have a continuous monitoring over industrial application, it also controls them if there is increase in their threshold conditions. It also detects the pollution in the atmosphere, which prevents people from various diseases. Future work will focus on improvement of above proposed work and adding features to make a reliable smart Industrial monitoring and pollution detection.

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