

Arduino based Industry Protection Safety System using IoT

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Abstract— This paper proposes a review on industrial process monitoring by using Arduino and IOT. The proposed work gives the design and implementation of industrial safety system using different sensors and IOT. This system design by using Arduino, different sensors, and IOT. which will automatically control and monitor the industrial applications and also allow the user to control the application from anywhere in the world. It has given us a promising way to build powerful industrial systems.

Keywords: Arduino Atmega328 Microcontroller, Sensor, Wi-Fi Module ESP8266, IoT (Internet of Things), Power Supply, Output (Fan, Lamp), Mobile Phone

I. INTRODUCTION

Now-a-days the accidents in the industries have increased. Even if any explosion occurs it can't be easily known to the laborers and it may cause accidents. So in order to avoid this, a system has been designed and this system is allowed to monitor the ambient situations inside the coal industry. Some of the environmental parameters such as gas leakage, temperature, LDR are sensed by using the high end sensors and the sensed data are transmitted to the mobile phone through ESP8266 Wi-Fi Module. A static ip address is configured in the microprocessor for the Wi-Fi. If the temperature exceeds a threshold, the cooling fan is automatically set to ON and if any gas leakage is detected the workers are given alert through a Lamp. The system is designed using a Arduino Atmega328 Microcontroller. The Wi-Fi dongle and sensors are attached to the Arduino and tethered with the mobile phone and can be controlled from a web browser using navigation buttons. By this the human intervention can be avoided inside the industry and the accidents can be prevented

II. LITERATURE REVIEW

Within industries the various hazardous gas are being processed [3], hence to provide security to those employ working within those industries, it becomes important issue to work on their security, If leakage of gas takes place then these system alerts by turning ON alarm which notifies the employers. This system also helps us take some crucial decision from any point of the world within internet network. Wi-Fi shield is being used to act as service point between network and connecting network [6]. Arduino based Industry Supervising system (ISS) aims the computers or mobile devices to monitor Industry features, functions and conditions automatically from anywhere around the world by using Internet [8]. In this paper we use Arduino Uno along with ESP8266 Wi-Fi module which enables the connection between Arduino and server[3].

Industrial Internet of Things (IoT) is the best way of connecting industrial machineries and sensors [12], to each other, over the internet, allowing the authorized user of the

industry to use information from these connected devices to process the obtained data in a useful way. IoT-connected applications typically support data acquisition, aggregation, analysis, and visualization. The IoT architecture includes latest technologies such as computers, intelligent devices, wired and wireless communication and cloud computing [7]. [9]A system has been designed to detect dangerous situations like breakdown which is the most important parameter for occurring leakage current in substation and help to avoid them. In addition safety scenes was created in order to verify the technique used in this method. This technique is designed to protect a human. This technique reveals harmful impacts of thermally dangerous areas and human's .Graphical interface has been created, which allows better configuration for more scenes [6].

This paper develops such a low cost electronic prototype which is designed for monitoring and controlling industrial [9]. Appliances via web browser from remote place. At the same time user can monitor security situation at industry in real time through different sensors installed at industry [10].

The system consists of a single master and multiple slaves with wireless communication based on WSN and a raspberry pi system that can either operate on raspbian Linux operating system. The parameters that can be tracked are current, voltage, temperature, and water level. The Android app is made to control industrial automation automatically using cloud. Manager manages this app with specific username and password. Manager can control this app automatically or manually [4].

Wireless communication is widely used in various fields like automation, military etc. The advanced technologies in wireless sensor network (WNS) lowers he data rate failure and increases its productivity in automation [11]. This paper proposes a review on industrial process monitoring by using raspberry pi and wireless communication [8].

Internet of Things is the next big revolution of the world on digitalization of commercializing various modules/products [12]. Everything is associated with the internet some involves controlling and some involves monitoring the parameters from anywhere. The Internet of Things is today's most trending technology that stands alongside wearable and robotics [2].

III. OVERVIEW OF PROPOSED SYSTEM

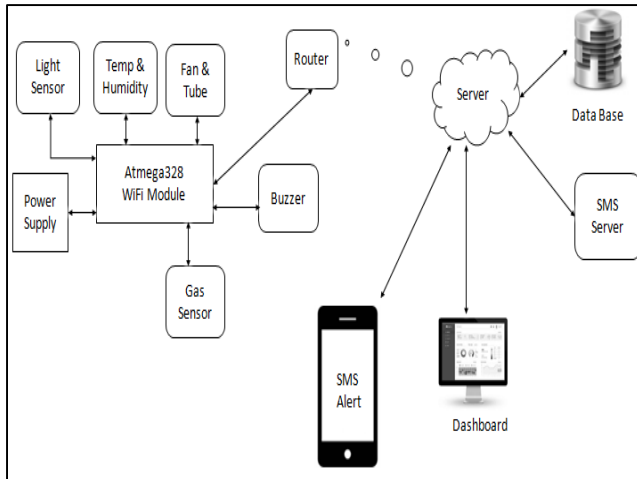


Fig 3.1: Block Diagram

A. Block Diagram Description

The block diagram of the proposed system is shown in Figure 3.1. Now-a-days, the industrial monitoring field requires more manual power to monitor and control the industrial parameters such as temperature, gas etc. This is the most upcoming issues in the industrial sectors. If the parameters are not monitored and control properly, it leads to a harmful situation. Most of the industries are facing those kinds of problems because of some manual interference. To overcome manual mistakes we are using internet of things the temperature sensor used here is DHT11. The working of the cooling fan depends on the above sensed data. DHT11 sensor has an operating range of about -55°C to 125°C . Inside the industrial area the temperature may exceed above 125°C . So this sensor is used. MQ3 gas sensor is used in order to sense the gas leakage in the industrial areas. A gas sensor is for detecting the combustible, flammable and the toxic gases. The MQ3 sensor mainly detects the methane gas which is most emitted in industrial areas. The voltage required is 5V which is provided from the GPIO pin. In the gas sensor, H-pins are allowed to heat for a while so that it can detect the gas. Once the gas is detected, an alert is given to the workers IOT (Internet of Things) introducing internet in industries can help to have control over the application from anywhere in the world.

IV. CONCLUSION

The designed system not only monitors the sensor data, like temperature, gas, light, sensors, but also alerts the user according to the requirement It reduces the cost of monitoring system at the same time. In industries to reduce manual overhead we have implemented Internet of Things (IOT) in Industry to monitor as well as to inform the responsible person through Wi-Fi, which is inbuilt in the mobile phones take Intelligent Decision manually from long distance as well. This technique saves time and manpower. Thus data can be monitored at remote locations with secured manner.

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