

IOT INDUSTRIAL MONITORING AND CONTROLLING SYSTEM

K. KRISHNA REDDY¹, K JEEVAN REDDY², G RAJESWARI³, K TEJO RANI⁴, K KALYAN KUMAR⁵, M LAKSHMAIAH⁶, B HARSHAVARDHAN⁷.

¹ASSISTANT PROFESSOR & HOD IN DEPT OF EEE IN *MOTHER THERESA INSTITUTE OF ENGINEERING AND TECHNOLOGY* PALAMANER, CHITTOOR DIST, ANDHRA PRADESH - 517408.

²ASSISTANT PROFESSOR IN DEPT OF EEE IN *MOTHER THERESA INSTITUTE OF ENGINEERING AND TECHNOLOGY* PALAMANER, CHITTOOR DIST, ANDHRA PRADESH - 517408.

^{3,4,5,6,7}.B.TECH IN DEPT OF EEE IN *MOTHER THERESA INSTITUTE OF ENGINEERING AND TECHNOLOGY* PALAMANER, CHITTOOR DIST, ANDHRA PRADESH - 517408.

Abstract

Nowadays, gas leakage is a major issue in the home and as well as industries. The sense of the gas is very low means we can't find it because of human negligence or lack of patience or some other external condition. If the gas level is increased, it causes some disaster. 1, to avoid this disaster in advance, the alternative idea is discussed in this paper. The system is developed with embedded sensors, controllers, and some IoT-based software. In this system, we are monitoring the detection of LPG gas leakages with some alerting features. Some sensors are used to monitor the different parameters like Temperature and humidity sensors (DHT22), gas sensors (MQ6), flame sensors (LM 2903), PIR sensors (HC-SR 501), and WiFi module (ESP8266). The sensors all are collect their information in their respective field and send data to the Wi-Fi module and it will perform.

Keywords: Arduino, Wifi module, Dht22, gas, Flame sensor & pir.

INTRODUCTION

IoT has the potential to change the world, it can create information about the connected objects, analyze it, and make decisions; in other words, one can tell that the Internet of Things is smarter than the Internet. It is also used widely in the industrial sector. In the industrial sector, safety and security are given more importance, so to prevent accidental explosions due to leakage of various gases we are developing an industrial monitoring system using IoT. . It will act as a security system also. The way this system works is that there will be an alarm when there's a gas leak with also displaying the gas level concentration and at which it will be in danger. Meanwhile, it will deduct all the people who all are entering the room.

2. LITERATURE SURVEY

S.Pandikumar and R.S. Vetrivel, presents GSM based outline of smart home controlling framework in IoT Condition. This framework empowers the clients to control and screen savvy gadgets through internet and furthermore it creates an interface amongst clients and savvy home by utilizing GSM what's more, web advances, or it can state that it makes GSM based remote correspondence from the web server into the savvy home. Clients give charges through web then the clients sources of info are changed over into GSM-SMS charges, at that point these summons are sent to embedded system module. This installed framework straightforwardly interface with gadgets through GSM network, lastly the client summons are parsed and executed by microcontroller to control any electronic articles like home machines, lights, and so on and it sends the acknowledgement.

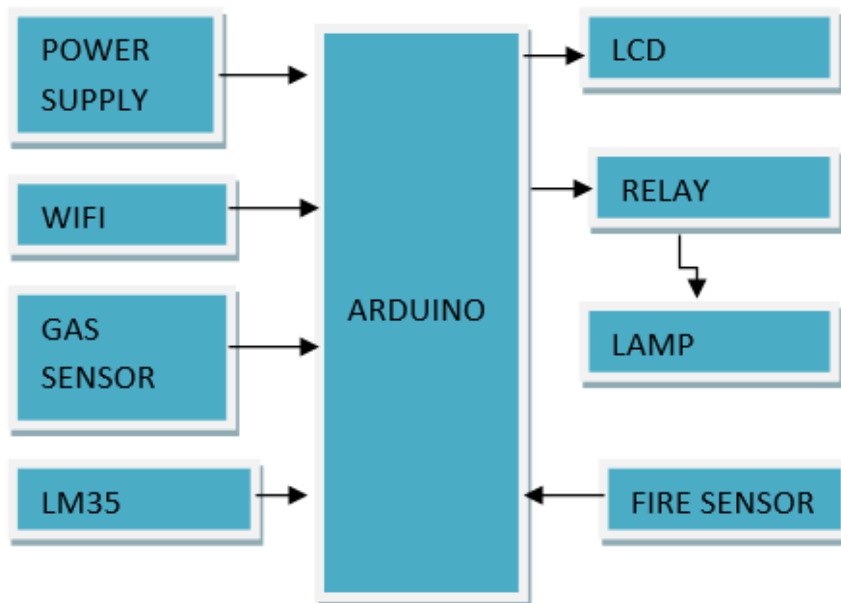
GauravTiwari and RiyazKazi, exhibit Autonomic Shrewd Sensor Interface for Industry in IOT Environment. Sensors are for the most part compelled by the device due to the present connect number, sampling rate, and signal types. In the event that required to associate gadgets required to compose confused and cumbersome information gathering programming code. This issue is tackled by outlining the shrewd sensor interface for mechanical WSN in IoT condition, in this field programmable gate array (FPGA) is received as a core-controller.

S. Liet.althis paper introduces an EIS combination plot in cloud administrations. The advances in hybrid wireless networks and cloud computing technologies makes it conceivable to build up a coordinated plan that can flawlessly incorporate these new advances into existing EISs. In this article, by taking the elements of half and half remote systems and distributed computing into thought, they propose a cloud-based administration arranged undertaking data framework, which incorporates frontend layer, center layer, and backend layers associated to IP EISs. In light of a communitarian design, a cloud administrations administration structure and process outline is exhibited. In our future works, we will execute the proposed system over Swan Mesh stage by incorporating the UPnP standard into an enterprise information system.

PROPOSED METHOD:

Temperature, Fire & humidity sensor, the production count circuit, illumination intensity circuit and power consumption circuit are used to percept the environment and object conditions. Analog signals are provided to Arm device produced by sensors and circuits. The digital equivalent of these signals is transmitted to the database server by virtue of the Wi-Fi module interfaced with the Arm 7. The data stored on the database server is transferred to the website time to time and the status of the alarm is checked continuously for any uneven conditions observed by the industry person on the website. Then adequate steps can be taken to solve the problems. This can be possible through past experience and similar previous condition stored in database. In this we use LAN as database for scalability. The industry person who will check the status of the industry through the website will have to login using a user id and password to get access to the website, this ensures security of the data.

BLOCK DIAGRAM



ARDUINO UNO



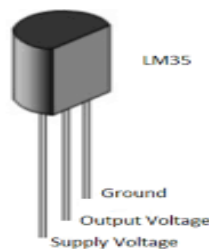
The **Arduino Uno R3** is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

LDR



Ldr sensor can be abbreviated as Light Dependent Resistor sensor. Each node consists of its own LDR sensor [14]. A light dependent device works on the principle of photoconductivity (i.e.) the resistivity of the material depends on the amount of light incident on them. During day when the light falls on the LDR, the resistance value decreases and at dark the value of resistance increases called as dark resistance. The resistance begins to drop drastically if the device is allowed to absorb light[21]. When a constant voltage is applied to LDR or when the intensity of light increases falling on LDR, the current tends to get increased.

TEMPERATURE SENSOR



The LM35 series are precision integrated circuit LM35 temperature sensors, whose output voltage is linearly proportional to the temperature in Celsius (Centigrade). The LM35 sensor thus has an advantage over linear temperature sensors, calibrated in °Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient centigrade scaling.

FLAME SENSOR



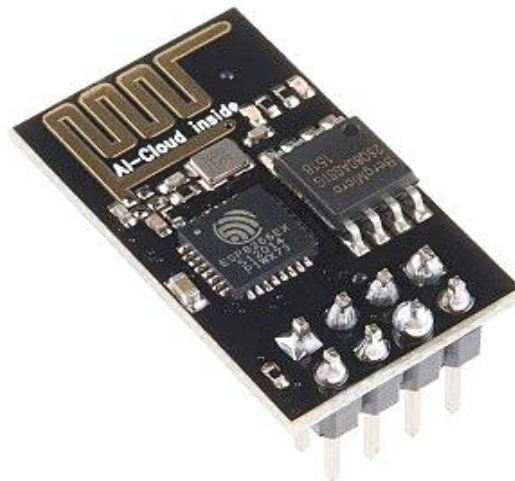
A flame-sensor is one kind of detector which is mainly designed for detecting as well as responding to the occurrence of a fire or flame. The flame detection response can depend on its fitting. It includes an alarm system, a natural gas line, propane & a fire suppression system. This sensor is used in industrial boilers. The main function of this is to give authentication whether the boiler is properly working or not. The response of these sensors is faster as well as more accurate compare with a heat/smoke detector because of its mechanism while detecting the flame.

MQ2 SENSOR



The **MQ-2 Gas sensor** can detect or measure gasses like LPG, Alcohol, Propane, Hydrogen, CO and even methane. The module version of this sensor comes with a Digital Pin which makes this sensor to operate even without a microcontroller and that comes in handy when you are only trying to detect one particular gas. When it comes to measuring the gas in ppm the analog pin has to be used, the analog pin also TTL driven and works on 5V and hence can be used with most common microcontrollers.

WIFI MODULE ESP8266



The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

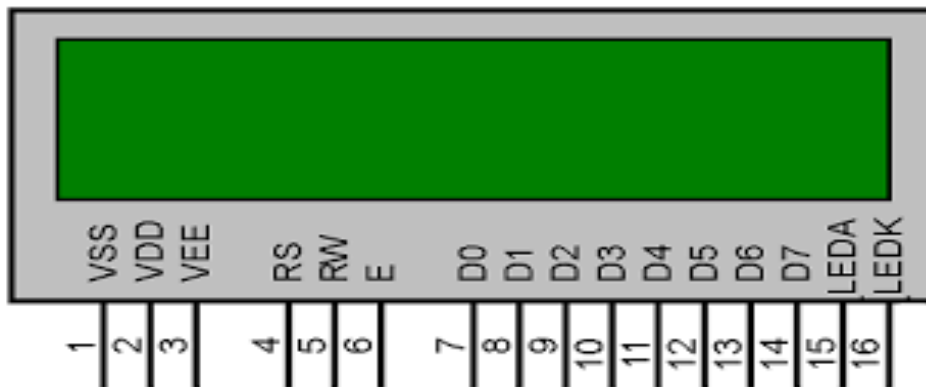
This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existence interfaces; it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF part.

RELAY



Relays are used in a wide variety of applications. The advantage of relays is that it takes a relatively small amount of power to operate. Relays are simple switches which are operated both electrically and mechanically. Relays consist of an electromagnet. It also contain a set of contacts. The switching mechanism is based on electromagnet. Most of the devices have the application of relays.

LCD



It is called Liquid Crystal Display. We are going to use 16x2 characters LCD. This will be connected to microcontroller. The job of LCD will be to display all the system generated messages coming from the controller. LCD will provide interactive user interface. This unit requires +5VDC for its proper operation. This module is used for displaying the present status of the system.

BUZZER

A **buzzer** is a small yet efficient component to add sound features to our project/system. It is very small and compact 2-pin structure hence can be easily used on breadboard, Perf Board and even on PCBs which makes this a widely used component in most electronic applications.

There are two types of buzzers that are commonly available. The one shown here is a simple buzzer which when powered will make a Continuous Beeepp... sound, the other type is called a readymade buzzer which will look bulkier than this and will produce a Beep. Beep. Beep. Sound due to the internal oscillating circuit present inside it. But, the one shown here is most widely used because it can be customized with help of other circuits to fit easily in our application.

RESULT



Fig: project kit



Fig: blink app interface

The Internet of Things provides access to a broad range of embedded devices and web services. Thing Speak is an open data platform and API for the internet of Things that enables you to collect, store, analyze, visualize, and act on data from sensors or actuators, such as Arm 7 and other hardware.

ADVANTAGES

- It is environmentally friendly, no harmful emissions.
- Longer life compared to conventional street lights.
- Power consumption is much lower.
- LDRs are sensitive, inexpensive and readily available devices. They have good power and voltage handling capabilities, similar to those of a conventional resistor.
- They are small enough to fit into virtually any electronic device and used all around the world as a basic component in many electrical systems.

CONCLUSION AND FUTURE WORK

Nowadays we need everything computerized. Earlier we can only monitor the situations with the help of cameras. 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 to take appropriate measures, but this will partially fulfill our requirement. As sometimes it will be late in this process and it will harm to property as well as life. For this purpose we are developing a system for Industrial Automation using IOT with the help of Artificial Intelligence to make system automated which will take intelligent decisions.

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