

SMART INDUSTRIAL SYSTEM FOR MONITORING, CONTROL AND SECURITY USING IOT

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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, 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 Smoke sensors, gas sensors (MQ6), float sensors, PIR sensors, and WiFi module (ESP8266). The sensors all are collect their information in their respective field and send data to the IOT

I. INTRODUCTION

IoT stands for the Internet of Things. It refers to the connection of devices other than computers and smart phones to the Internet [1]. Devices on the IoT range from cars, kitchen appliances, alarm systems, and medical devices like heart monitors. It is basically anything that can connect to the Internet that isn't traditionally considered a thing you'd connect to the Internet. Smart intelligent system consists of the automation and security both is included on it. The smart system has been smartest when the highest security system has been added on it [2][3]. A smart system is highly automated system. This is called intelligent because of having a computer system to monitor the whole system and take a decision after taking corresponding signal from the sensor. Smart intelligent industrial security system is one that has highly advanced automatic systems for controlling lighting and temperature, multi-media equipment for monitoring and activating security apparatus (alarms and alerts) associated with windows and doors and many other functions. This system appears "intelligent" because its computer systems can monitor many aspects of daily life. It is packed with various technologies and sensors to gather information about the current status in the smart home (e.g. where is the user located, what does the occupant do, current temperature etc.) and the other hand the target of such a house is to increase the quality of life of the user. Besides protecting home against intruders, there are many advantages to investing in a home security alarm system [4][5].

II. LITERATURE SURVEY

Develop an IoT by addressing some of the technical Uses wireless devices and conventional cable methods to enable a

sequence of data collection and control activities in a network of nodes. A graphical user interface was built to enable control and visual display of the gathered data, using the industry-standard field bus protocol mod bus TCP in combination with the Lab VIEW programming environment [6]. In order to allow end devices to manage huge volumes of gathered data, we studied the design difficulties involved with implementing IOT equipped with industrial condition monitoring. In a vibration-based condition monitoring case study, the obstacles are assessed statistically and viable solutions are investigated. There's a good chance that smart industries will be able to enhance their technology in the future as a consequence of efficient and long-term condition monitoring [7]. For biogas facilities, I've developed an IOT-based efficiency monitoring system For the purpose of measuring gas production and consumption; a micro-controller system based on As an SMS gateway, the Android-based application provides a free alternative to commercial solutions. Using a dashboard that plots use information, the plant administrator may keep an eye on the various [8]. An IOT system that detects hydrocarbon pollution created by retail gasoline outlets in real time has been suggested (which referred to a service or stations). Hydrocarbons in groundwater can be detected using our solution, which incorporates a low-cost, highly accurate fiber optic sensor that integrates seamlessly into the current monitoring system [9].

III. METHODOLOGY

PROPOSED SYSTEM

The proposed model mainly consists of Arduino UNO microcontroller which is the heart system. The functioning of the system is low-cost, highly efficient WiFi module ESP826601. There are 4 sensors viz., Flame sensor, PIR sensor, Float sensor and gas sensor which are connected microcontroller through which they send the physical parameter values ThingSpeak.com. The use of float sensor is to detect overflow of any liquid in tanks. Gas sensor issued to detect harmful gas leakages and flame sensor is used to detect fire. All the sensor data will be uploaded to webpage by using wifi module.

BLOCK DIAGRAM

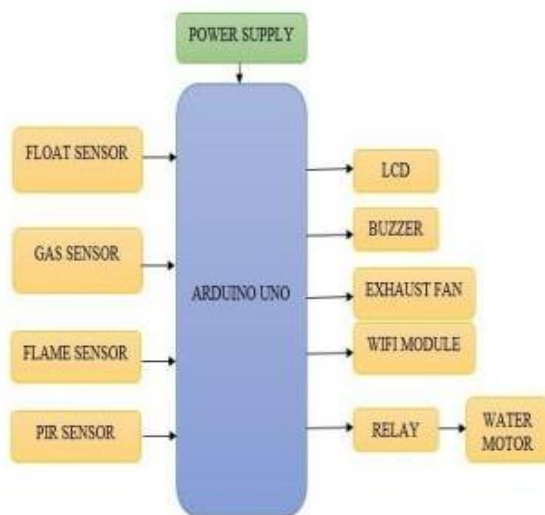


Fig 2: Block diagram

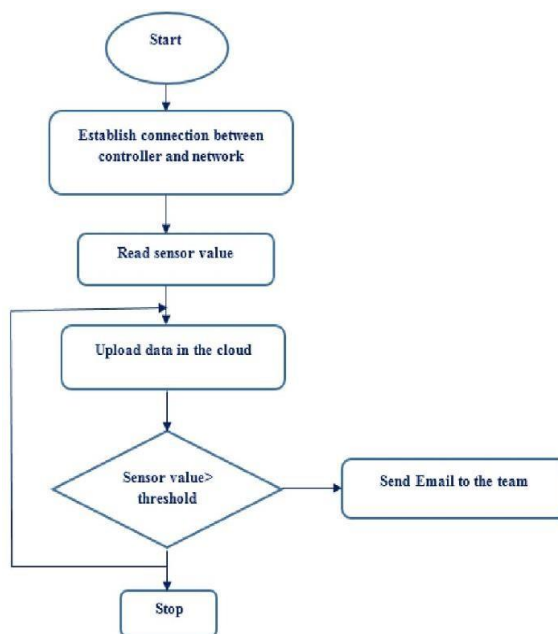
The MQ-2 Gas sensor can detect or measure gases like LPG and butane. The MQ-2 sensor module comes with a Digital Pin which makes this sensor to operate even without a microcontroller and that comes in handy when you are only trying to detect one particular gas. **PIR sensors** detect general movement, but don't give information as to who or what moved. For that purpose, an imaging IR sensor is required. PIR sensors are commonly called simply "PIR" or sometimes "PID" for "passive infrared detector." The term passive refers to the fact that PIR devices don't radiate energy for detection purposes. They work entirely by detecting infrared (radiant heat) emitted by or reflected from objects. **A flame detector** is a type of sensor that can detect and respond to the presence of a flame. These detectors have the ability to identify smokeless liquid and smoke that can create open fire. For example, in boiler furnaces flame detectors are widely used, as a flame detector can detect heat, smoke, and fire. Magnetic **Float Sensors** are sensors which are used to detect the level of liquid within any kind of container. Magnetic float sensors feature a magnetic float that rises and falls with the level of liquid.

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

All digital circuits require regulated **power supply**. In this article we are going to learn how to get a regulated positive supply from the mains supply.

Mini water pump For Fountain Garden Mini water circulation System DIY project. This is a low cost, small size Submersible Pump Motor which can be operated from a 3 ~ 6V power supply. It can take up to 120 liters per hour with very low current consumption of 220mA

IV. IMPLEMENTATION



V. HARDWARE RESULTS



Fig 3 Harmful gas detection



Fig 4 Flame detection

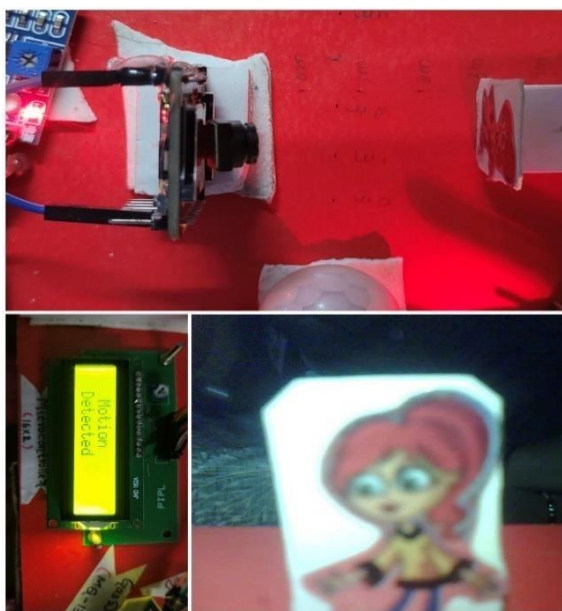


Fig 5 Motion detection

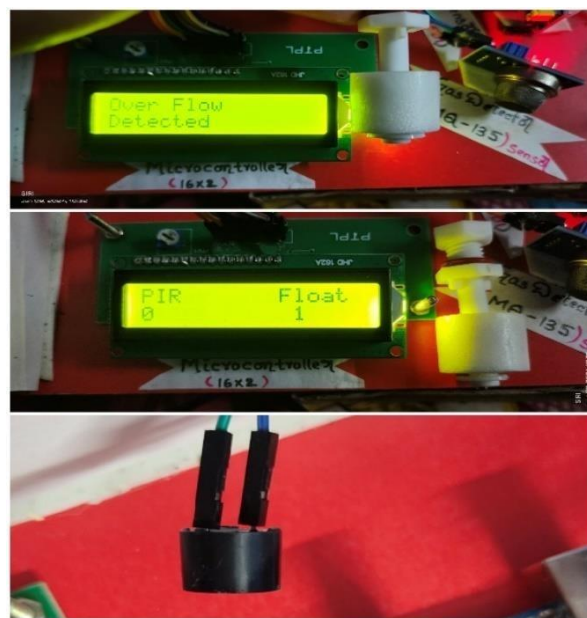


Fig 6 overflow detection

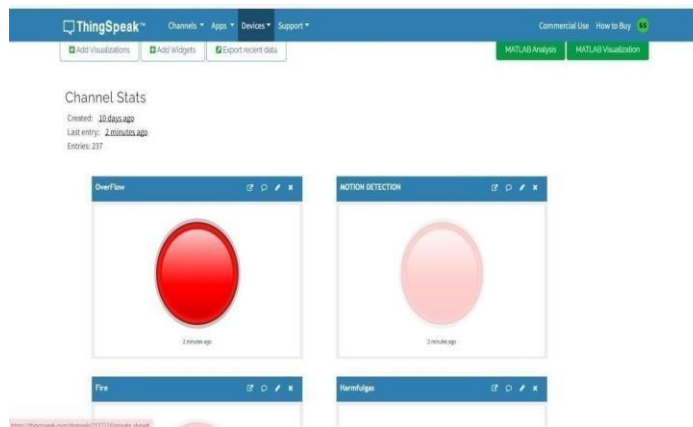


Fig 7: IOT visual

VI RESULT

The gas sensor are used to detect the gas leakage, Float sensor is used to detect the boiler or liquid overflow in industries, PIR sensor is used to detect the movement and get visual image of detected body through via email to security management systems and flame sensor are used to detect any occurrence of fire. If the level of the gas reaches above the normal level, the first alert is intimated from the Google cloud as it is automatically close gas leakage valve and then industry will take immediate step to control pollution .to over come that problem, we introduce the PIR sensor with camera and also live visual of detection of motion through IOT. From existing system there is no IOT connection to every sensor but we over come that, we introduce the IOT through every sensor with combination of analogue and digital inputs with live visual of every sensor detection through the management of controller in industries system.

Table 1 Values between existing and proposed system

Parameters	Existing values	Proposed values
Gas sensor	150	110
Flame sensor	1100nm	765nm
PIR sensor	7m	2m

Table 2 Output values from various sensors

Test case	Gas Sensor	Flame Sensor	PIR Sensor	Float Sensor
1	30	0	0	0
2	110	765 nm	2m	25%
3	120	800 nm	3m	50%
4	140	950 nm	5m	75%

VII. CONCLUSION

This security System is cheaply made from low-cost available components and can be used to control more than others. This system is easily adjustable at any industry or office space. The designed system was tested a number of times and successfully control from different place. Finally, this security system can be also implemented over Bluetooth, Infrared and WI-FI connectivity without much change to the design. Hence, this system is scalable and flexible

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