

Automation in Fire Protection System Using Internet of Thing (IoT): A Review

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Abstract- In current scenario we all want automation in every important work like water saving, Electrical power saving fire protection system etc. By using Internet of thing we can achieve automation from anywhere or remotely. IoT is an important sector which deals with the data distribution and internet usage over the component communication. Fire is unpredictable situation and very dangerous if it happens. So, it is important to detect and act fast before the condition get worst. In this paper, we will study about an IoT based Fire Alerting System for buildings which can detect fire as early as possible using various sensors, act accordingly without any human interaction and send related information through IoT. In this Review paper will analysis of fire protection system and their solution.

Keywords- IOT (Internet of thing), GPS/GSM/GPRS, CAN (Controller Area Network), Gas/smoke sensor.

I. INTRODUCTION

A fire alarm system has a number of devices working together to detect and warn people through visual and audio appliances when smoke, fire, carbon monoxide or other emergencies are present. These alarms may be activated automatically from smoke detectors and heat detectors or may also be activated via manual fire alarm activation devices such as manual call points or pull stations. Alarms can be either motorized bells or wall mountable sounders or horns.

Fire Detectors play a very important role in Industries, Shops, Malls, Residential complexes, parking areas etc. They help in detecting fire or smoke at an early stage and can help in saving lives. Commercial Fire detecting systems usually have an alarm signaling, with the help of a buzzer or Siren. We have designed an IOT based Fire Alerting System using Temperature and smoke sensor which would not only signal the presence of fire in a particular premise but will also send related information through IOT.



Fig.1 IoT Network.

2. NODEMCU ESP8266 Wi-Fi Development Board

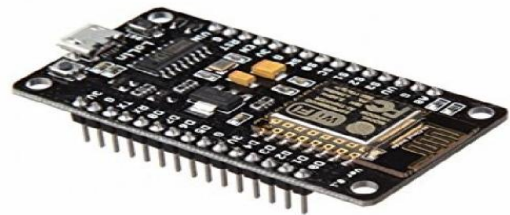


Fig. 2 Nodemcu

Node MCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the development kits. The firmware uses the Lua scripting language.

1. LPG Gas and Smoke Sensor

Description: This is a simple-to-use liquefied petroleum gas (LPG) sensor, suitable for sensing LPG (composed of mostly propane and butane) concentrations anywhere from 200 to 10000ppm. The sensor's output is an analog resistance.



Fig.3 LPG Gas (MQ-6) and Smoke sensor MQ 2.

This is a very easy to use low cost semiconductor Gas sensor Module with analog and digital output. This

module uses MQ2 Smoke & Flammable gas sensor as a gas sensing element. It requires no external components just plug in Vcc & ground pins and you are ready to go.

2. Infrared IR sensor

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These are types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor.



Fig. 4 IR sensor.

II.RELATED WORK

Author:- Ravi Kishore Kodali

Title:- “IoT Based Smart Emergency Response System for Fire Hazards”

Research:- In this Research paper it is proposed that an emergency response system for fire hazards is designed by using IoT standardized structure. To implement this proposed scheme a low-cost Espressif wi-fi module ESP-32, Flame detection sensor, Smoke detection sensor (MQ-5). [3]

Author:- Ahmed Imteaj

Title:- “An IoT based Fire Alarming and Authentication System for Workhouse using Raspberry Pi 3”

Research:- In this paper, we have propounded a system which is capable to detect fire and can provide the location of the affected region. Raspberry Pi 3 has been used to control multiple Arduino which are integrated with a couple of sensors and camera. [4]

Author:- Ahmed Imteaj

Title:- “Internet of Things for Smart Cities: Interoperability and Open Data”

Research: - The authors provide a case study of the Green IoT platform in Uppsala, Sweden The Internet of Things (IoT) has been viewed as a promising technology with great potential for addressing many societal challenges. With these challenges in mind, the European Union and many other countries are investing in information and communication technology (ICT) research and innovation, and developing policies to improve the quality of life of citizens and sustainability of cities.[5]

III. PROBLEM FORMULATION & SOLUTION

- Old system has more complicated wired System.
- Cost is Very High.
- There is no mechanism or techniques for human movement detection in building's rooms and floors.
- No display techniques are available.

IV.PROPOSED SYSTEM

In our Proposed System we will add some more sensors like:

- Object Detection sensor in building's room and floor
- Automation in open window function using DC gear box motor.
- On Sprinkler Automatically
- Things peek Technology and GPS Sensor for fire brigade Send a alert SMS to Fire Department/Subscriber.

V. CONCL USION

In providing a public safety and security services it is very important to adopt leveraged data driven emergency response systems with urban IoT design standards. A smart emergency response system for fire hazards is designed and implemented with required IoT standards which prioritize the immediate rescue operations by pushing relevant information to the public safety managements.

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