

Review Paper on Microcontroller Based Fire Detection Alarm System

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Available online at: www.ijcseonline.org

18/May/2018, Published: 31/May/2018

Abstract-This paper presents primarily on a low cost fire search and control system based on smoke and heat identification proposed. It has a combination of electrical / electronic devices / devices working together to identify keeping people through audio or visual media after detecting fire and presence. Fire alarms are used in the context of fire or fire drill. They manually or automatically activated. After fire protection goals are established-usually by referring to the minimum level appropriate model building code, mandatory protection by insurance agencies, and other officials - the Fire Alarm takes on the designer details specific parts, arrangements, and required interfaces to achieve these goals [1]. These sets out various circuits for the paper spot the fire. These alarms can be activated smoke detectors or hot detectors, which detects the fire. Then, it will automatically use a relay send short message service (SMS) to registered mobile numbers. Switch water scratch or solenoid pump spraying water or fire spraying.

Keywords: Alarm, Fire Detection, Audio or Visual Medium, Relay

I INTRODUCTION

Automatic fire detection and control are now required to reduce fire in the building and industry. Automatic fire alarm system real-Time Surveillance, Monitoring and Automatic Alarm. A key ear to protect the fire is to find a flowing fire emergency situations in an emergency situation, and the warning of the building residents and fire emergency organizations. The same the role of fire recognition and alarm systems. Fire alarm circuit is very useful for security reasons. Exclusively Equipment these are designed and standard installation methods designed during design. Different circuits can be created for this purpose [1]. Typically fire detectors are designed to respond to one [2] One of the four main features of the initial phase combustion, heat, smoke, flame or gas. No one type detector is suitable for all types of campus or fires. Heat detectors respond to a temperature increase associated with a fire and smoke respond to smoke or gas to feed the search the fire was created.

The authors explain [3] the whole structure and design automatic fire alarm system and fire alarm control Software. Authors [4] discussed the automatic fire alarm the system is based on wireless sensor networks and [5] SMS based on quick responses. There are various smoke detecting systems available now their work was discussed in detail [6]. Different traditional smoke detectors and their application the given details [7].

A fire or smoke alarm system can be locally monitored on campus or in distant areas required. The owner of the premise provides the benefit of remote alarm system monitoring unless there is a remote location and a manual system, take immediate steps to receive an emergency message. Wireless Sensor Networks can create remote monitoring systems in different ways using Ethernet and images processing and other digital information technologies [8, 9]. Although systems are reliable, they are one a wide range of pros, they are complex, incomplete, independent, ex-Contains tragic and involuntary drugs. Therefore, there is a need for a reliable system and fast, responsive as well as simple, easy to run and cost effective.

Fire Detectors Types

Fire detectors with different specifications depending on different scenarios and different scenarios demands. Most or less of these detectors can be classified as heat or thermal detectors, smoke or gas detectors. Semiconductor gas detectors, and flame detectors [10] [11].

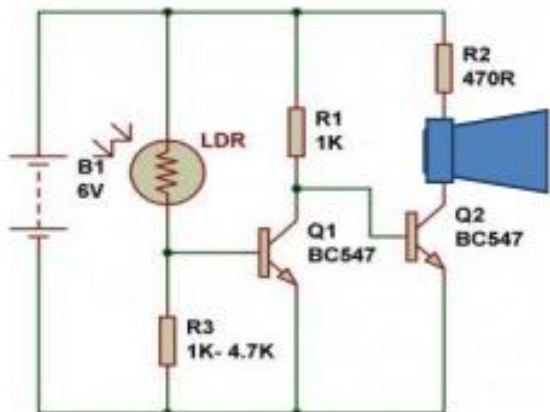


Fig 1 Smoke sensor circuit

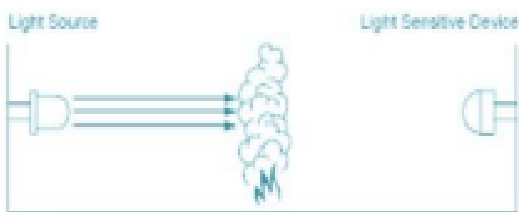


Fig 2 Smoke sensing tube

LDR is used in the smoke sensor circuit as shown Fig.1. When the light is blocked by the smoke, the LDR growth prevention, therefore, the collector-Base voltage increases, making it Q1 the Q2 also turns on, gives the fire signal by loud Horns. Tube with light source and light sensing the device used in our system for smoke sensing is shown Fig 2. Smoke or gas detectors, a relatively newer invention, became widespread during 1970's and 1980's. These detectors usually detect fire in early flaming or smoldering stages. These detectors can be of different types having different operation principles, namely—optical or photoelectric detectors, ionization detectors, air sampling detectors etc. [6]-[8]. Each of these types has specific applications in specific circumstances. Photoelectric or optical smoke detectors include various components, mainly, a light source (usually an infra-red LED), and a lens to converge light rays into a beam, and a photodiode [6]. In normal condition, the light beam passes straight. But whenever smoke interrupts the path of light, scatters fraction of light into the photo-diode, the smoke detector is activated. This method of detection can detect fires that begin with long duration of smoldering aptly [9]. Ionization smoke detectors are based on ionization from radioactive elements like ameri-cium-241.

Heat sensor

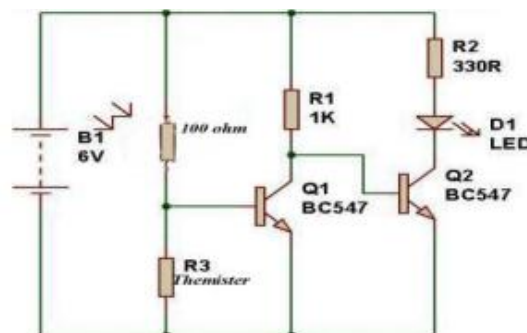


Fig 3 Heat sensor circuit

Thermal sensor circuit 7. Almost works as shown in Fig 3 As smoke sensor. Instead of LDR, the thermistor is used here. Thermistor resistance decreases with increasing heat. Thus the collector-base voltage will increase base-emitting voltage. Which sensor unit will on. Heat or thermal type detectors are the most independent fire detectors types, 1800s [7]. Most of these detectors fix temperatures, which are predefined temperature. The remaining varieties are activated when they have abnormal growth in temperature on the premises. Thermal detectors are reliable, inexpensive, and easy to maintain and have a low false alarm rate. But this detective-Targets are slow, and by the time they reach earlier detected detection, the damage may already happen. Thus these detectors are limited use.

Flame type detectors

Flame type detectors are advanced devices to detect fire flame phenomenon. These detectors have different types depending on the light wavelength they use. Infrared, infrared, and cam-The binomial of UV / IR type detectors. UV detectors usually work with less than 300 nm wavelengths. These type detectors can detect flames and explosive conditions in 3 - 4 milliseconds from UV radiation from events. However, Lightning, arc welding reduces the false warning prompted by UV sources. One time delay is often added UV Flame detector. Nearby infrared sensor or visual flame detectors work with middle wavelengths of 0.71.1 μm. One of the most trusted technologies available for fire detection is multi-channel or pixel Series sensors, monitors flames in the near IR band. Infrared (IR) Flame Detectors work inside Infrared spectral band (700 nm - 1 mm). These detectors have a simple response time of 3 - 5 seconds. Also, there is UV and IR includes flame detectors, comparing the encryption signals in both jungles to detect and fire the minimize alarms [11] [12]. Flame detectors are expensive and complex, although they provide a very loyal and accurate response. The Other detectors work in the most sensitive environment that cannot be used. Aircraft handling facilities, Fuel loading platforms, mines, refineries, high-tech industries use these flame detectors for this safety [7].

Semiconductors or Smoke detectors

This is done by the chemical reaction principle between fire risk and the gas from the semiconductor the material inside the sensor is present (Figure 1). Semiconductor material used in these sensors metal oxygen, typically tin dioxide (SnO_2), tungsten oxide (WO_3), etc. Under normal conditions, surface efficiency the sensor circuit acts as a potential barrier to controlling the electron flow. However, deoxidizing gases reduces the density of the oxygen surface from fire accidents, and thereby reduces the barrier that permits electron Drain. Electron flow activates the electrical circuit associated with the increase in conductivity and activates the alarm [13] to take the necessary steps. These semiconductor sensors have extensive applications for their functional features. They are small, Compact, inexpensive, easy to install and maintain. This metallic oxide type detectors are apt to be used to identify fire Gas, methane, propane, alcohol, carbon monoxide, Etcitty. These detectors are best suited for our purpose and we have chosen this in our system.

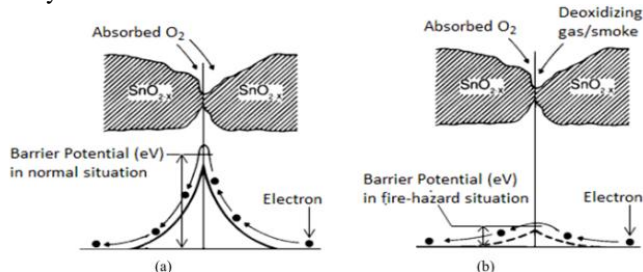


Fig.4 Working principle of semiconductor sensor (a) higher barrier potential restricts electron flow (b) reduced barrier potential permits electron flow resulting rise in Sensor conductivity [13].

IV Conclusions and Discussions

In this paper we proposed an automatic fire alert and fire distinguishing system by sensing smoke and heat. We have experimented our proposed system in our laboratory and noticed its feasibility. It is also seen that the system does not respond if the fire generates very small smoke particles and very small amount of heat. The system does not display properly if two or more than two rooms or blocks are affected at a same time. Early fire detection is best achieved by the installation and maintenance of fire detection equipment in all rooms and areas of the house or building.

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