

Automated Fire Extinguisher for Society using Display Panel

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Abstract— In this project i.e “AUTOMATED FIRE EXTINGUISHER FOR SOCIETY USING DISPLAY PANEL” Basically fire is detected and a control system based on smoke and heat detection is proposed. In this work existence of fire detector is that it can be carried out for remotely alerting fire incidence in the surroundings. When there is a fire emergencies operations it is essential to establish and to utilize the situational awareness that are important in enabling the responders specially during incidents to get better access on changing on scene situations and to take informed decisions. Our proposed systems is to alert the distant owners quickly by sending a short message via GSM and voice alerting system. During the fire accidents this system will guide the usage of fire extinguisher.

Keywords: Automated Fire Extinguisher, GSM and Voice Alerting System

I. INTRODUCTION

Before we come to the importance of fire detection and indication system it is necessary to understand fire detection systems and automatic sprinklers, it is beneficial to possess a basic knowledge of fire development and behaviour. With the prior information about fire development and behaviour, the role of fire safety systems in the protection process can then be better realized.

A fire is a chemical reaction in which a carbon based material (fuel), gets mix with oxygen or component of air, and is heated to a point where flammable vapours are produced. These vapours can also come in contact with something i.e hot enough to cause vapor ignition, which will be resulting in the fire.

Libraries, school, hospitals, institutions and also museums, historical structures may contain numerous fuels which includes books, manuscripts, records, cabinets, furnishings, and laboratory chemicals. Any item containing wood, plastic, paper, fabric, or combustible liquids can be potential fuel. They may contain several common, potential ignition sources which includes any items, actions, or processes which can produce heat. These encompasses electric lighting, power systems, heating and also ac equipment and also electric office appliance. Flame generating construction activities like soldering, brazing, and cutting are common sources of ignition.

A primary aspect of fire protection is to identify a developing fire emergency in a timely manner, and to alert the building's occupants and fire emergency organizations. This is the role of alarm and fire detection systems. This depends on the scenario of fire, building and use type, number and type of occupants, and criticality of contents and mission. These systems provides main functions.

1st, they will provide a mean to identify a developing fire either through manual or automatic methods.

2nd they will alert building occupants about the fire condition and that they need to evacuate the place. Another function is that, the transmission of an alarm notification

signal to the fire department and also to the other emergency response organization. They will also shut down their electrical, air handling equipments and they can be used to initialize the automatic suppression systems.

II. LITERATURE SURVEY

| REFERENCE PAPER NO: | DATABASE USED: |
|---------------------|--|
| [1] | They alerted the distant property-owner efficiently and quickly by sending short message (SMS) via GSM network by Kwon, O.H., Cho, S.M. and Hwang, S.M in Design and implementation of fire detection system |
| [2] | A review of existing fire-detector types has been carried out along with the development of a low cost, portable, and reliable PIC microcontroller based automated fire voice alerting system for remotely alerting any fire incidents in industrial premises by International Journal of Scientific & Engineering Research, Volume 7 in Design and development of automatic fire detection using sms and voice alert system |
| [3] | Automatic fire alarm system provides real-time surveillance, monitoring and automatic alarm by Lei Zhang ¹ , and Gaofeng Wang ² in Design and Implementation of Automatic Fire Alarm System based on Wireless Sensor Networks |

Table 1: Database Used by Referred Papers

III. METHODOLOGY

Lm35 Fire Detection sensor is used to detect the fire in the system. Microcontroller receives the signal from the sensor. In the next step other externally connected devices receives active signal that are sent by microcontroller, by changing programming GSM module and alarm alert SMS is being send. We have to make changes in program so as to change the SIM card. Input is given to the microcontroller with the help of the fire sensor unit. It under goes the various safety once the input is given to the microcontroller actions for that microcontroller is programmed in such a way to undergo process.

The microcontroller unit gives the output to the GSM module, once the input is given. GSM module sends the information to the cell phone in the form of SMS to the customer. Meanwhile it alerts and also indicates on display panel the coordinates and the location of the affected area. Working Method in these fire detector is a device that senses and detects fire, as an indicator of fire. Security devices issue

a signal to a fire alarm control panel as part of a fire alarm system.

SMS based Fire Alarm system are very useful in buildings, institutes, hospitals, etc where human interaction is limited. Voice Alert system combines fire alert system in which digital voice technology is used today.

These devices are paired with each fire extinguisher and use a smart pressure gauge to continuously check for fluctuations.

IV. PROPOSED WORK

Detectors: Presently, humans can be excellent fire detectors. A healthy person is able to sense multiple aspects of a fire such as heat, flames, smoke. This is the reason, where most fire alarm systems are designed with more than one manual alarm activation devices to be used by the person who will discover a fire. But unfortunately, a person may also be an unreliable detection method, since they may not be present when a fire starts, they won't be able to raise an alarm in an effective manner, or may not be in perfect health to recognize fire symptoms. This is the reason why a variety of automatic fire detectors have been developed. Automatic detectors are meant to imitate more than one of the human senses of touch, smell or sight. Thermal detectors are similar to the ability of identifying high temperatures, smoke detectors which replicate the sense of smell. The properly selected and installed automatic detector can become a highly reliable fire sensor.

Some of the detectors have fixed temperature which activates at a predefined temperature while others include types which activate when there is an abnormal rise in the temperature. Eg. Heat sensor LM35

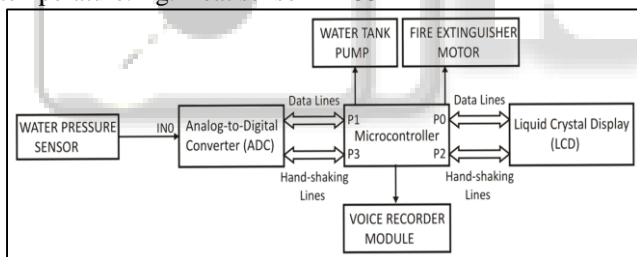


Fig. 1: Block Diagram of Proposed work

Sprinklers: For most of the cases of fires, water represents the ideal extinguishing agent. Fire sprinklers utilize water by direct application onto flames and heat.

This causes cooling for the combustion process and also it prevents ignition of adjacent combustibles. These are most effective during the initial fire's flame growth stage, when the fire is relatively easy to control. A proper sprinkler will detect the fire's heat, initiate alarm, and begins suppression within moments after flames appear. In frequent instances sprinklers will control the advancement of fire within a few minutes of their activation, which will in turn result in significantly less damage. Sprinkler systems are series of water pipes which supplied by a reliable water sources. At the selected intervals, these pipes are independent, heat activated valves known as sprinkler heads. It is the sprinkler i.e responsible for distribution of water onto the fire. Most sprinkler systems include an alarm to alert occupants and emergency forces when sprinkler activation occurs.

Control Unit: The control unit is the brain of this system. It is responsible for monitoring the various alarm which act as an input devices such as manual and automatic detection components, and thereby activating alarm which are also an output devices like horns, bells, warning lights, and building controls. Control unit can range from simple units with a single input and output, which is complex computer driven systems that monitor several buildings over an entire campus.

The essential component of control unit is atmega8, it is a low power Atmel 8-bit AVR RISC based general purpose computer. It has optimized power consumption and good processing speed, it has small physical dimension. Its low cost makes this microcontroller a perfect fit match for our project.

Power Supply: A 12v rechargeable battery is used to supply uninterrupted powers to all the systems. LM7805 voltage regulator will regulate 5v to power up microcontroller and sensor unit. This battery is charged by A.C power under the control of a charger controller. The battery charge level is being monitored by applying a reference voltage to an ADC of the microcontroller unit.

Alarm System: On receiving an alarm notification, the fire alarm control panel must tell someone that an emergency is on the way. This is the key function of the alarm output aspect of a system. Occupant signaling components may include various audible and visual alerting components, and that are the primary alarm output devices.

All the sensors are connected to the control unit, so whenever any of the sensors detect any anomaly the control unit starts its action. It activates the GSM module, thereby an alarm message in the form of SMS will be rendered at the same time through the GSM network to the authorities and the fire station nearby.

Display Panel: A liquid crystal display has been interfaced to the controller to show the status of the system, RS232 serial communication protocol has been used to control the GSM module, a DB9 serial port also has been connected to the microcontroller for any firmware update

V. RESULTS

The system reports a host of conditions, including pressure levels and charge status when equipped with a sensor, it also detects when the fire extinguisher is blocked, or is missing from its mount.

The electronic monitoring systems are easily connected to the fire alarm or security system. Not only is this helpful when a fire extinguisher's pressure drops to unsafe levels, but remote monitoring is ideal for facilities to have a high occurrence of vandalism, like in schools, institutes, buildings and hospitals.

VI. CONCLUSION

In this project, we can conclude that this proposed system can provide a safe, secure and efficient way for avoiding accidents. The proposed system, which can be installed at the industry, colleges, buildings, offices, school, consists of fire sensors GSM module, microcontroller unit, alarm and Fire extinguisher. This component performs three different operations and the input is given to the microcontroller under

critical condition and it automatically undergoes the prevention actions and our proposed idea can give benefit to the industries, colleges, buildings, offices, schools by saving their life during accidents using the automatic fire extinguisher to operate the fire. GSM is placed inside the system in order to send the up to date information about the status of surrounding area. By implementing this modern fire safety system in actual practice, due to more safety for industries, colleges, buildings, offices, schools, can not only gain more benefits, but also, we can bring our safety system towards global standards.

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