WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

HARDWARE IMPLEMENTATION OF AN AUTOMATIC FIRE EXTINGUISHER AND ALERT SYSTEM ON ATMEGA PLATFORM

Nanadhanakrishna K R[1], Nandana P[2], Akshaya M[3], MS.Remya K P[4]

[1] Department of Electronics & Communication Engineering Jawaharlal College of Engineering and Technology Palakkad, India
nandhanakrishnakr@gmail.com
[2] Department of Electronics & Communication Engineering Jawaharlal College of Engineering and Technology Palakkad, India
nandanagangadharan12@gmail.com
[3] Department of Electronics & Communication engineering Jawaharlal College of Enigineering and Technology Palakkad, India
akshayamurali610@gmail.com
[4]Associate Professor , Department of Electronics & Communication Engineering ,Jawaharlal College of Engineering and Technology,Palakkad,India

ABSTRACT—

This project presents an automatic fire extinguisher system utilizing the ATmega microcontroller. Integrated with temperature sensor and flame sensor, it detects fires and triggers extinguishing mechanisms. Additionally, it sends alerts to mobile devices for swift response and remote monitoring, enhancing fire safety measures.

Introduction :

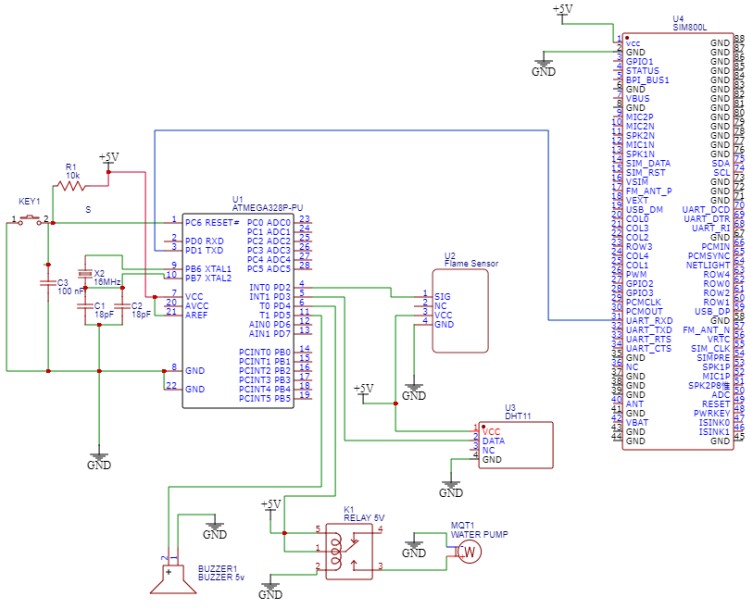
The Fire hazards pose a significant threat to lives and properties. This is an automatic fire extinguisher system coupled with an alert message system to mobile devices provides a rapid recovery compared to the traditional system. This ground breaking system not only detects fires promptly but also takes immediate action to suppress them while simultaneously alerting users remotely.

METHODOLOGY :

The methodology comprises integrating flame and temperature sensors with the ATmega microcontroller to monitor the environment. upon fire detection, the microcontroller activates the fire extinguisher and sends alerts to mobile devices using GSM. This streamlined approach enables rapid response and notification, enhancing overall fire safety measures.

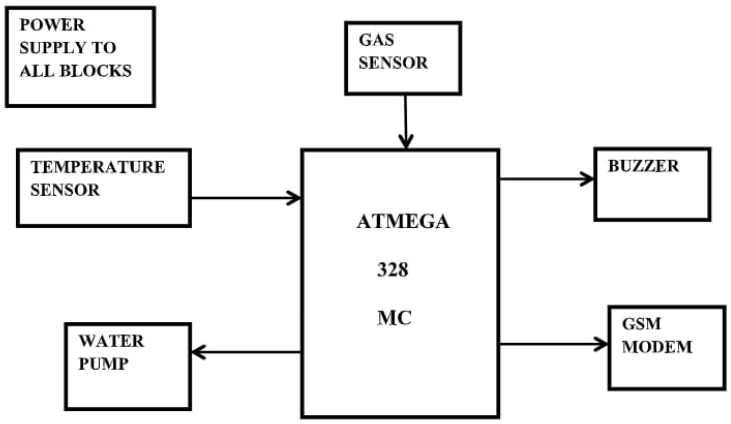
The key components are:
ATmega328PMicrocontroller,Temperature sensor,Flamesensor,DCmotor,Buzzer,GSM modem.

CIRCUIT DIAGRAM :



Sensors like temperature or flame sensors are used to detect the presence of fire.ATmega microcontroller will receive input from the fire detection sensor and control the actions of the extinguisher and alert system. Connect a relay module to the ATmega to control the activation of the fire extinguisher. The relay will act as a switch to turn the extinguisher on or off. Connect the fire extinguisher to the relay module. When the microcontroller detects fire, it triggers the relay to activate the extinguisher.A buzzer is used to provide an alert when fire is detected. Connect these alert components to the ATmega, and program it to activate them when the fire sensor detects a fire. Provide a stable power supply to the circuit, ensuring it has enough voltage and current to operate all components reliably.Communication modules like GSM are added to send alerts to a remote monitoring system or to notify users via SMS.

BLOCK DIAGRAM :



The block diagram of automatic fire extinguisher and alert system consist of a flame sensor, temperature sensor, buzzer,water pump,GSM modem etc. once the fire is confirmed the two sensors works as an input because these two sensors sends the signals to ATmega microcontroller and after receiving the signal microcontroller activates the appropriate output Here water pump, Buzzer, GSM modem are considered as output because these devices are helps to suppress the fire and activate people to take immediate action.

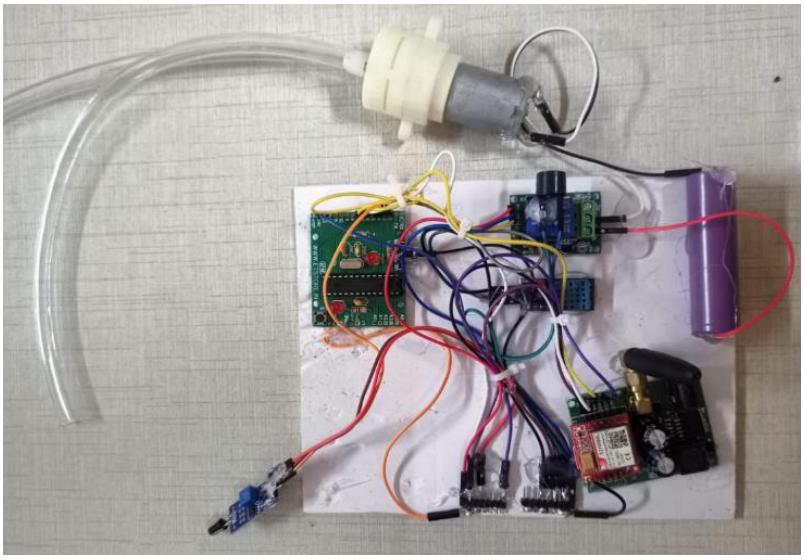
WORKING :

When the system employes fire sensors to detect and to continuously monitor the environment for the signs of fire[1].
Here two types of sensors are used to detect the fire

- Temperature sensor
- Flame sensor

Once the fire is confirmed the ATmega microcontroller activates the automatic fire extinguisher system.Here the extinguishing agent is water.The extinguishing agent is released from the water pump directing it towards the source of fire[2].The rapid deployment of the extinguishing agent helps to suppress the fire before it can escalate and damage.Simultaneously the ATmega microcontroller sends an alert message to predefined Mobile devices, such as smartphones, using wireless communication protocol such as GSM[3].This message notifies users about the detected fire providing crucial information about the location and severity of the situation[4].Upon receiving the alert message, user can take appropriate actions, such as evacuating the premises, contacting emergency services etc..Throughout the process, the ATmega microcontroller continues to monitor the environment for any changes or developments[5].

RESULT :



The implemented automatic fire extinguisher and alert system successfully detected fires and promptly activated the extinguisher, mitigating potential damages and enhancing safety. Through its efficient operation, the system demonstrated its effectiveness in responding to fire emergencies, underscoring its importance in fire prevention measures

CONCLUSION :

In conclusion, the fire detection and extinguishing system with temperature monitoring and SMS feedback provide an advanced solution for mitigating fire risks and enhancing safety in residential, commercial, and industrial environments. By integrating advanced sensors, microcontroller intelligence, GSM communication capabilities, and user-requested feedback functionality, the system detects fires in real-time, monitors ambient temperature, triggers timely alarms and extinguishing actions, and provides users with current temperature updates via SMS, thereby minimizing the impact of fire accidents and safeguarding lives and property.

REFERENCE :

[1] International Journal of Emerging Technologies and Innovative Research,2014 Fire Detection and Extinguisher System
Authors : Prathamesh Gundekar,Sahil Wadkar,Shubham Mahindra,Prof. S.R Kale

[2] International Journal Of Creative Research Thoughts (IJCRT) Automatic Fire Extinguisher System
Authors: Vijay Gaikwad,Atharva Hire,Haider Hirkani,Pranav Hole,Shantanu Hippargekar,Prajwal Holkar

[3] International Conference of Scientific and Engineering Research Design Development of Automatic Fire Detection using SMS and Voice Alert System
Authors : R.Sathishkumar,M.Vinothkumar,Devaraj Varatharaj,S.Rajesh,S.M.Gowthaman

[4] Journal of University of Shanghai for science and technology Fireplace Detection And Extinguisher Robot
Authors: Naina Mahile, Dipalichakole,Nikita kotangale, Mitali charde,Triveni pendams.

[5] International Research Journal of Engineering and Technology(IRJET) Automatic Fire Extinguisher System
Authors : Saurabh Sarang,Sanket Kahane,Manoj Matsagar,Vaibhav Kokane,Amol Varade