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Smart pyro Machine

Prof. S.M.Bankar¹

Department of E&TC
PDEA's College of Engg.
(manjariBk)Pune-412307)

T.M. Lohare²

Department of E&TC
PDEA's College of Engg.
(manjariBk)Pune-412307)

V.S. Patil³

Department of E&TC
PDEA's College of Engg.
(manjariBk)Pune-412307)

K.K. Todkari⁴.

Department of E&TC
PDEA's College of Engg.
(manjariBk)Pune-412307)

1. ABSTRACT

Nowday's people are searching for something creative and smart technologies for the various events and also for the entertainment purpose, so we are creating our project on the pyro machine or the automatic fireblast machine. The Smart Pyro Machine introduces an advanced system for controlled fire generation and management, leveraging cutting-edge technology to enhance both safety and spectacle in applications ranging from emergency training simulations to entertainment industry special effects. This paper discusses the design and implementation of the Smart Pyro Machine, which integrates real-time sensors, automated control systems to create precise and repeatable fire effects while ensuring user safety and regulatory compliance.

The core innovation lies in the machine's ability to analyze real-time data from environmental and internal sensors to adjust fuel mixtures, ignition timing, and blast intensity. This adaptive approach allows for high degrees of control and repeatability, essential for both training firefighters in realistic scenarios and for creating visually striking effects in films without endangering cast or crew.

2. INTRODUCTION

In recent years, the integration of advanced technologies such as automation into industrial and entertainment applications has dramatically transformed operational efficiencies and safety protocols. Among the innovative technologies emerging in this area, the Smart Pyro Machine stands out as a pivotal development in controlled pyrotechnic and fire management technology. This machine is designed to enhance the safety,

precision, and spectacle of controlled fire blasts used in a variety of applications, from film special effects to fire-fighter training and safety demonstrations.

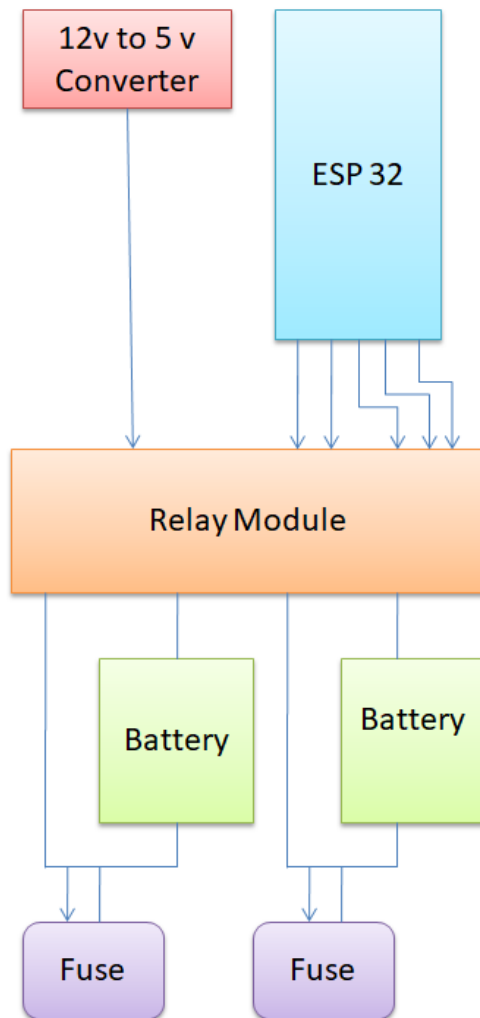
The motivation behind the development of the Smart Pyro Fire Blast Machine is twofold: to push the boundaries of what can be safely achieved in controlled fire displays and simulations, and to provide a tool that minimizes risk while maximizing control and repeatability. Traditional methods of handling pyrotechnics and fire blasts rely heavily on manual intervention, which carries inherent risks and variability in performance. The Smart Pyro Fire Blast Machine addresses these issues by employing a sophisticated suite of sensors, and automated systems that together ensure a high degree of accuracy and safety.

By enhancing control and safety, the Smart Pyro Fire Blast Machine not only improves the operational aspects of fire management but also broadens the creative possibilities for industries reliant on precise and spectacular fire effects.

Designing a "smart pyro machine," or a smart pyrotechnic device, would involve creating a system that can intelligently manage and control fireworks or pyrotechnic displays. This could involve elements of automation, remote control, safety enhancements, and integration with software for design and synchronization.

3. METHODOLOGY

1. Block Diagram:



Converter(12v to 5v): A voltage converter that steps down from 12 volts (V) to 5 volts (V) is commonly referred to as a DC-DC buck converter. Buck converters are widely used in electronics to efficiently reduce voltage levels while maintaining a stable output.

Battery : A battery is a device that stores electric power in the form of chemical energy. When necessary, the energy is again released as electric power for DC consumers such as lighting and starter motors. A battery consists of several galvanic cells with a voltage of 2 volt each.

Processing Unit (ESP-32):

ESP-32 is a feature-rich SOC with integrated Wi-Fi and Bluetooth connectivity for a wide-range Of IOT applications. ESP32 can perform as a complete standalone system or as a slave device to a host MCU, reducing communication stack overhead on the main application processor. ESP32 can interface with other systems to provide Wi-Fi and Bluetooth

functionality through its SPI / SDIO or I2C / UART interfaces.

Relay Module: A relay module is an electromechanical device used in electrical circuits to control the flow of electricity. It works by using an electromagnet to mechanically switch electrical contacts on or off.

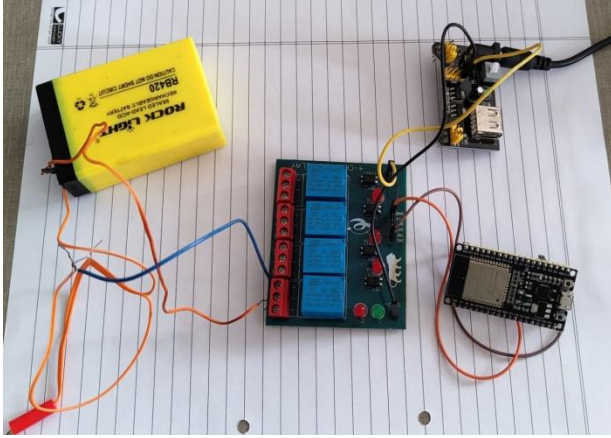
Fuse:

Fuses are essential electrical components designed to protect electrical circuits from over current situations, such as short circuits and excessive loads, which can lead to damage or fire hazards.

Working:

In Smart Pyro machine we use 12v 1A Adapter it uses to apply the supply to converter, convert can convert 12 v into 5 v to relay module. There are four relay modules. ESP 32 can be used to connect to mobile phone via Bluetooth. In ESP 32 upload the program for sending supply to fuse for blasting in sequence or randomly. In ESP 32 pin 02,00,16 ,04 these pins are connected to relay module for sending the command from mobile.

ESP 32 is connected mobile via Bluetooth in mobile phone serials Bluetooth app send the command as ki 'a' for 1 fuse is blast, 'b' for 2 fuse is blast.'c' for 3 fuse blast. 'd' for 4 fuse blast. 'e' for All fuse blast at a time. For ESP 32 work on external power supply.

Project model:**4. CONCLUSION**

In conclusion, the Smart Pyro Machine represents a significant advancement in controlled fire management technology, offering a blend of safety, precision, and versatility that sets new standards in various industries. By providing a reliable means of generating controlled fire effects, the machine empowers users to create captivating displays while minimizing risks associated with traditional pyrotechnic methods.

The Smart Pyro Fire Blast Machine not only enhances the safety and precision of controlled fire management but also unlocks new creative avenues and efficiencies across a range of industries. As it continues to evolve and find new applications, its contribution to safety, entertainment, and innovation remains invaluable.

Further research and development will continue to expand its capabilities and unlock new possibilities for creativity, safety, and efficiency.

5. REFERENCES

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