

UNIVERSITI TEKNOLOGI MARA

**THE DEVELOPMENT OF
AUTOMATIC SMOKE AND LPG
REMOVAL WITH FIRE ALARM
MONITORING SYSTEM**

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ABSTRACT

The number of people lose their lives in residential fires tend to rise every year. In a fire, deadly gases tend to spread faster and faster than heat. That is one reason why most of the fire victims die from, which is from the inhalation of smoke and toxic gases, not from burns. Most fatal fires happen when families are asleep because the occupants are not aware of the fire until they are trapped and there is no adequate time to escape. Furthermore, LPG is one of the reasons causes buildings to set on fire. LPG is classified as flammable substances and is colourless, odourless and heavier than air. The presence of LPG could flash and explode if it encounters an ignition source. To overcome this problem, The Development of Automatic Smoke and Gas Removal with Fire Alarm Monitoring system is proposed. Gas Sensor MQ-6, Smoke Sensor MQ-2, Fire detection sensor IR Flame Detection Sensor and DHT 22 Temperature sensor and push button has been used as input while piezo buzzer, L298N as motor driver, DC fan, LCD and Wi-Fi module (ESP8266) has been used as output and are connected to Arduino Mega 2560 as the main microcontroller. The Automatic Smoke and LPG Removal with Fire Alarm Monitoring System will be equipped with safety alarm Monitoring alarm to alert people inside the room that has been installed the device that detected any dangerous gases more specifically smoke and LPG gas and the buzzer, and DC-fan will turn ON to alert people and filter out the dangerous gas outside the room by using DC-fan. Moreover, this device could be developed to prevent any upcoming incident inside a room or building that are caused by fire and inhalations of toxic gases that are deadly.

Keywords— Fire Alarm Monitoring System, Smoke sensor MQ-2, LPG sensor MQ-6, IR Flame Detection sensor, Buzzer, L298N motor driver, LCD, DC – Fan, Arduino Mega 2560

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CHAPTER ONE

INTRODUCTION

1.1 Research Background

Every year in United states (US), about 2,000 people lose their live residential in residential fires. In a fire, deadly gases tend to spread farther and faster than heat. That is one reason why most fire victims die from inhalation of smoke and toxic gases, not from burns. About two-third of home fire death occur in homes with no fire alarm system. In October 2021, two factories along Jalan Masai lama, Pasir Gudang were couth on fire. The Johor Fire and Rescue department took almost 10 hours to put the fire down. Base on this article, this incident could not have happened if the factories had good fire alarm monitoring systems

Fire will often consume most of the available oxygen, slowing the burning process. This 'incomplete combustion' results in carbon monoxide released into the air, which is deadly. Toxic gases are also released by certain burning objects, with carbon monoxide being the most common. Other toxic gases are released depending on what has caught fire, such as hydrogen cyanide from burning plastics and phosgene from household products such as vinyl materials. Fire reduces oxygen levels dramatically, which is deadly for anyone in the room. Normal outside air is around 21% oxygen. If the oxygen level goes down to 17% people can experience impaired judgement. Less than this has more serious effects, down to unconsciousness at 9% and death at 6%.

Furthermore, LPG is one of the reasons causes building to set on fire. This incident can be shown On April 2009 approximately 11.00 pm, there was a fire and explosion in storage of liquefied petroleum gas (LPG). LPG is classified as flammable substances and is colourless, odourless and heavier than air. Present of LPG can be detected by the distinctive pungent odour due to injection of ethyl mercaptan as an odorant. The LPG release cloud flash and explode if it encounters ignition source.

LPG is made up of propane and butane. Propane undergoes combustion reactions in a similar fashion to other alkanes. In the presence of excess oxygen, propane burns to form water