POLITEKNIK

SULTAN SALAHUDDIN ABDUL AZIZ SHAH

ARDUINO CO2 GAS LEVEL

NAME	REGISTRATION NO
MUHAMMAD RAKINUDDIN BIN MOHD RIZAUDIN	08DEU19F2026

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2021

ARDUINO C02 GAS LEVEL

NAME

MUHAMMAD RAKINUDDIN BIN
MOHD RIZAUDIN

REGISTRATION NO

08DEU19F2026

This report submitted to the Electrical Engineering Department in
fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

NOVEMBER 2021

CONFIRMATION OF THE PROJECT

The project report titled "Design a CO2 gas level Using Arduino" has been submitted,

reviewed and verified as a fulfills the conditions and requirements of the Project

Writing as stipulated

Checked by:

Supervisor's name   : PUAN MASILAH BINTI ATAN

Supervisor's signature:

Date   :   21/06/2022

Verified by:

Project Coordinator name   :

Signature of Coordinator   :

Date   :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature   :

Name   : **MUHAMMAD RAKINUDDIN BIN MOHD RIZAUDIN**

Registration Number : **08DEU19F2026**

Date   : ~~28.12.2021~~   16/06/2022

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE   :   ARDUINO CO2 GAS LEVEL

SESSION: SESI 1 2021/2022

1.   I,   **1. MUHAMMAD RAKINUDDIN BIN MOHD RIZAUDIN**

is a final year student of **Diploma in Electrical Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah**, which is located at **Persiaran Usahawan, 40150 Shah Alam, Selangor**. (Hereinafter referred to as 'the Polytechnic').

2.   I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3.   I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electrical Engineering** to me.

Made and in truth that is recognized by;

a) **MUHAMMAD RAKINUDDIN BIN MOHD RIZAUDIN**

(Identification card No: - 010824010607)

)   · Rakin

....……………………….

)   **MUHAMMAD RAKINUDDIN BIN MOHD RIZAUDIN**

In front of me, **PUAN MASILAH BINTI ATAN**

(Click here to enter text.)

As a project supervisor, on the date:

)

)   ....………………

)   **PUAN MASILAH BINTI ATAN**

21/06/2022

ACKNOWLEDGEMENTS

ABSTRACT

C02 gas level is a device for estimating the level of co2 (carbon dioxide) in the air. Carbon dioxide (CO2) is a colorless and odorless gas that can only be detected with a measuring instrument and which is deadly in high concentrations. the result was conducted on student,workers and other communities show communities are lack of knowledge and awareness of carbon dioxide .Based on the research we did we found a lot to know carbon dioxide(c02), but they do not know the dangers or effected of c02 like dizziness, confusion, fatigue, vertigo, headaches, tinnitus, and even seizures or asphyxiation effect on their health. Higher levels of CO2 can be life-threatening; and prolonged exposure to Carbon Dioxide (CO2) can even cause a change in one's metabolism and bone calcium. Realizing the danger of c02 on human health we have developed a Arduino co2 gas level detecter which is not only can detect the level of co2 but able to save the data. This device will help the community out there that can take care of their health. so they are not prone to self-threatening disease caused of c02 air. It is a user friendly,reliable and easy to handle.

Keyword: Carbon dioxide , gas level , air

> **Commented [FAP1]:** The abstract must be simple, written in one
> paragraph and not more than 200 words in one page.
> The abstract should be written in single spacing.
> The abstract should contains, an introduction, problem statement, research objectives, results and conclusion (optional)

ABSTRAK

Paras gas C02 ialah alat untuk menganggar paras co2 (karbon dioksida) di udara. Karbon dioksida (CO2) ialah gas tidak berwarna dan tidak berbau yang hanya boleh dikesan dengan alat pengukur dan boleh membawa maut dalam kepekatan tinggi. keputusan telah dijalankan ke atas pelajar, pekerja dan komuniti lain menunjukkan masyarakat kurang pengetahuan dan kesedaran tentang karbon dioksida . Berdasarkan penyelidikan yang kami lakukan, kami mendapati banyak mengetahui karbon dioksida(c02), tetapi mereka tidak mengetahui bahaya atau kesannya. daripada c02 seperti pening, kekeliruan, keletihan, vertigo, sakit kepala, tinnitus, dan juga sawan atau kesan sesak nafas pada kesihatan mereka. Tahap CO2 yang lebih tinggi boleh mengancam nyawa; dan pendedahan berpanjangan kepada Karbon Dioksida (CO2) malah boleh menyebabkan perubahan dalam metabolisme dan kalsium tulang seseorang. Menyedari bahaya c02 terhadap kesihatan manusia, kami telah membangunkan pengesan aras gas Arduino co2 yang bukan sahaja dapat mengesan tahap co2 tetapi mampu menjimatkan data. Peranti ini akan membantu masyarakat di luar sana yang boleh menjaga kesihatan mereka. jadi mereka tidak terdedah kepada penyakit yang mengancam diri sendiri yang disebabkan oleh udara c02. Ia mesra pengguna, boleh dipercayai dan mudah dikendalikan.

Kata kunci: Karbon dioksida , paras gas , udara

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LIST OF ABBREVIATIONS

ABBREVIATIONS	FULL NAME
FYP	FINAL YEAR PROJECT
VDC	VOLTAGE CIRECT CURRENT
RPM	REVOLUTION PER MINUTE
IOT	INTERNET OF THINGS
PCB	PRINTED CIRCUIT BOARD

CHAPTER 1

1 INTRODUCTION

1.1 Introduction

Cities are getting overpopulated and much polluted day by day. Pollution is a major problem in urban areas, be it developed countries or developing ones. The increase in population in cities is coetaneous with an increase in vehicles and the increase in pollution. Considering the emerging problem of pollution, the school,workplace and hospital is the main place that should not be exposed to pollution because the rooms in the classroom such as the operating room, sterilization room and icu room must always be in a clean condition.

Air quality monitoring is well known and established science which started back in the '80s. At that time, the technology was quite limited, and the solution used to quantify the air pollution complex, cumbersome and really expensive.

This project has tried to model this feature using the popular prototyping board – the Arduino. In this Arduino project, the MQ-135 air quality sensors are interfaced with the Arduino. The MQ-135 is used to sense the carbon dioxide (c02). If the air's dust level is greater than a threshold or the pollution level is greatest.

1.2 Background Research

> **Commented [FAP3]:** This section contains the introduction to the issues which the research/project is concerned

the spread and development of the Internet of Things (IoT), highly accurate and compact sensor devices for environmental measurement have been developed and can be used in a variety of situations. These sensor devices are used not only for specific facilities, but also for measuring and adjusting the environment of places where people normally live, such as smart homes and smart offices . By quantifying the state of the environment with these sensor devices, it has become possible to objectively evaluate changes in the environment that cannot be captured by human senses. However, there are many factors that should be evaluated in a person's living environment, and it is difficult to manage all of them , such as tobacco smoking and ambient particulate matter pollution. Therefore, it is necessary to identify and control the factors that may exist in any living environment to support people's lives. In this study, we focus on the concentration of carbon dioxide (CO_2) in a room. Since CO_2 is generated and accumulated by human activity, it is necessary to prevent a decrease in the quality of human intellectual activity due to an increase in CO_2 concentration. Furthermore, according to the study by U. Satish et al., it is considered to be "Relative to 600

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ppm (parts per million), at 1000 ppm CO2, moderate and statistically significant decrements occurred in six of nine scales of decision-making performance." Thus, even concentrations as low as 1000 ppm have been shown to have an adverse effect on human decision-making. For this purpose, it is necessary to predict the change in CO2 concentration and control it so that the concentration in the room is below constant. In order to maintain the quality of intellectual activity in human interaction in a room, we analyze the diffusion tendency of CO2 in exhaled air and investigate a model to predict CO2 concentration. Specifically, in this study, we measured and analyzed how CO2 diffused in a low concentration zone, which had not been noticed until now, by simultaneous multipoint sensing. In addition, we selected a prediction model from the experimental results and compared the prediction model of CO2 concentration in the existing room with the measurement device in the actual room in three different sized rooms on the same basement level of the same building, and verified whether the existing prediction model is applicable to the measurement method using the measurement device.

1.3   Problem Statement

In this project it is difficult because the coding for this project are difficult to build and not using the electronic coding correctly. After that, the project is inaccurate the air quality detection. Lastly, the electrical power is no durable.

The measurement of CO2 concentration has been around for a long time, even before the development of sensor technology, and the measurement of CO2 using plants was reported as far back as 1990 . CO2 concentration is also used as a measure of focus, and it has been reported that there is a correlation between CO2 concentration, the discomfort index and the number of blinks, which is a measure of ability to concentrate . In recent years, with the development of the IoT, CO2 concentration sensors have become smaller and smaller, and they are used as devices for environmental measurement such as forest fires . These sensor devices equipped with CO2 concentration sensors and gas sensors are installed on the university campus to verify the air quality . Similar to the present study, Piotr Batoga et al. reported a study in which the concentration was measured using simultaneous multipoint sensing to predict the CO2 concentration. In this report, the CO2 concentration in the bedroom during sleep was predicted to be about 150 ppm by using a Computational Fluid Dynamics (CFD) simulation, but as a result of measuring the CO2 concentration by using a CO2 concentration sensor, the CO2 concentration exceeded 3000 ppm. The CO2 concentration in the ambient air was about 400 ppm, indicating that the CO2 concentration in the bedroom was more than 7 times higher than the outside air. Therefore, simulation like CFD is not always effective, so it is necessary to make actual measurements using a measurement device.

1.4 Research Objectives

The main objective of this Project is to measure co2 gas level in classroom and office from pollution to get a good quality air

More specifically the principle objective of this research are:

1. To design air quality monitoring helps us assess the impact caused by poor air quality on public health
2. To analyze c02 in classroom and office from pollution
3. To develop facilities carbon dioxide scanning

1.5 Scope of Research

1. This Project is focusing to student and workers
2. The emphasis is suitable for home,classroom,office and library
3. The main controller is there are many room should not be polluted like school and workplace and this measure co2 gas level can also be used by hospitals to keep the air in the operating room clean

Commented [FAP4]: This section contains clear scopes and limitations that you have considered in the project.

1.6 Project Significance

Every innovation created must have its own approach and benefits, so our idea of creating this measure gas level c02 is an excellent idea in the aspect of health and also suitable for all moreover for students, employees and others. It is also suitable for all groups as it is affordable and efficient nowadays. it also benefits the user as it can facilitate the user to understand the ambient temperature and can spare us from headache, fatigue, difficulty breathing, coma and seizures due to ambient temperature. It is also easy to carry anywhere

Commented [FAP5]: This section contains the significance of the proposed project/research. You should cite previous research in this area. You should cite those who had the idea or ideas first, and should also cite those who have done the most recent and relevant work. You should then go on to explain why more work was necessary (your work, of course.)

1.7 Chapter Summary

In this chapter, studies have been explained about the origins of ideas and inspiration. All of the stated objectives can be achieved through a problem statement. Therefore, with this Arduino measure co2 gas level we can create an innovation that benefits everyone, especially every group. This measure co2 gas level is not only useful for consumers but can help improve health. This is because this co2 gas level makes us aware of the ambient air. Next, the scope of this project describes about Arduino measure co2 gas level and suitable area for co2 gas level. In conclusion, this measure of co2 gas level can provide a good impact and advantage to consumers.