

**CONSTRUCTION OF A MONITORING SYSTEM FOR THE
ANALYSIS OF TEMPERATURE & HUMIDITY VARIATION IN CAR**

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**CONSTRUCTION OF A MONITORING SYSTEM FOR THE
ANALYSIS OF TEMPERATURE & HUMIDITY VARIATION IN CAR**

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**This report is submitted in partial fulfilment of the requirements
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BORANG PENGESAHAN STATUS LAPORAN
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DEDICATION

Specially dedicated to my beloved father, NORIDAN BIN TURIMAN and my beloved mother, SERI MARZALINDA BTE KERYA who keep supporting and advices me in the process of completing this project research. Besides, I also dedicated all of this to all of my beloved sibling, lecturers and colleagues who motivates me to do better work for this research.

ABSTRACT

In this project, the main objective is to design and develop a temperature and humidity monitoring system that capable to measure the changes of temperature and humidity variation for further analysis. This monitoring system is constructed with basic components such as microcontroller, sensor and displayer. The operation of the system is controlled by the Arduino UNO. Measured data is obtained from temperature and humidity sensor which is DHT11. The measured data is displayed on LCD 16x2 and Serial Port/UART function of Integrated Development Environment, (IDE) software. The constructed monitoring system is well-functioned because it capable to display the desired output. From test conducted, data is collected at different time block with different weather. Data is collected to be analysed as stated in the objective of project. The main aspect analysed in this project is the suitable setting of air-conditioning adjustment to achieve the comforted temperature and humidity inside of car. Another aspect analysed in this project is the effect of temperature and humidity variation outside of car towards the temperature and humidity variation inside of car. Several improvement of project in future has been purposed due to several limitation occurred during execution of this project.

ABSTRAK

Dalam projek ini, objektif utama adalah untuk merekabentuk dan membangunkan sistem pemantauan suhu dan kelembapan yang mampu mengukur perubahan suhu dan kelembapan untuk dianalisis pada akhir projek. Sistem pemantauan ini dibina daripada beberapa komponen asas seperti mikrokontroler, sensor dan pemapar. Operasi sistem dikawal oleh Arduino UNO. Data yang diukur diperolehi daripada sensor suhu dan kelembapan iaitu DHT11. Data yang diukur akan dipaparkan pada LCD 16x2 dan Port Siri yang mempunyai fungsi UART dalam Perisian Pembangunan Bersepadu (IDE). Sistem pemantauan yang dibina mampu berfungsi dengan baik kerana mampu memaparkan hasil yang diinginkan. Dari ujian yang dijalankan, data dikumpulkan pada blok masa yang berbeza dengan cuaca yang berbeza. Data dikumpul untuk dianalisis seperti yang dinyatakan dalam objektif projek. Aspek utama yang dianalisis dalam projek ini adalah untuk mengkaji tetapan penyesuaian penyaman udara yang sesuai untuk mencapai suhu dan kelembapan yang selesa di dalam kereta. Satu lagi aspek yang dianalisis dalam projek ini adalah untuk mengenalpasti kesan suhu dan kelembapan variasi di luar kereta terhadap suhu dan kelembapan variasi di dalam kereta. Beberapa pembaikan projek pada masa depan telah dirancang kerana terdapat beberapa batasan semasa pelaksanaan projek ini.

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LIST OF SYMBOLS AND ABBREVIATIONS

IDE	:	Integrated Development Environment
T1	:	Temperature measured from sensor 1
T2	:	Temperature measured from sensor 2
T3	:	Temperature measured from sensor 3
H1	:	Humidity measured from sensor 1
H2	:	Humidity measured from sensor 2
H3	:	Humidity measured from sensor 3
USB	:	Universal Serial Bus
UART	:	Universal Asynchronous Receiver-Transmitter
USB	:	Universal Serial Bus

CHAPTER 1

INTRODUCTION

This chapter provides a review about project entitled “Construction of a Monitoring System for The Analysis of Temperature and Humidity Variation in Car”. This chapter give a brief explanations on information required for the development of this project. Several information provided in this section are background, problem statement, objectives and scope of work, project significance and the structure of this report.

1.1 Background of Project

Along with the latest technological advances, various systems have been built to provide a better lifestyle to the community. In fact, technology that has been built helps facilitate the implementation of a task. Furthermore, most technologies are built to provide solutions to current problems that arise in society. Every developed

technology has a different purpose such as monitoring, education, medical or instructional. Thus, different type of technology will have a different purpose of technology that requires a different input and output.

The monitoring system is one of the most frequently used monitoring technologies today. The system aims to monitor ongoing activities to ensure that these activities are in the field and manage to meet both goals and performance targets. Examples of current monitoring systems are air monitoring, water, soil and temperature monitoring systems. Although these systems have different monitoring functions, the basic structure of the construction is much the same.

The performance of today's monitoring technology has been enhanced through the enhancement of wireless networks in the process of data reception and transmission. Furthermore, the effectiveness of monitoring technology can be enhanced through good and systematic planning. This is because good planning helps to focus on the primary purpose of a system to achieve the expected outcome.

1.2 Problem Statement

Problem observed is driver constantly adjusting the air-conditioner adjustment manually while driving because they are uncomfortable with the condition car caused by inconsistent weather, time block and outside temperature. Drivers will keep adjusting the air-conditioner adjustment while driving because they cannot identify the comfort condition in car. If drivers keep adjusting the air-conditioner adjuster while driving, this will distract their attention and can prone to accidents. This is because driver can lose their focus while driving because they have to adjust the air-conditioner manually. Besides, drivers also may lose focus while driving if they feel uncomfortable with the temperature and humidity inside car such as too cold or too

hot. Thus, driver's act by constantly adjusting air-conditioner adjuster occurred because the comfort temperature and humidity range in car cannot be identified due to changes of time block and weather. So, the problem to be solved for this project is to identify the effect of outside temperature and humidity towards the changes of temperature and humidity variation in car. In future, this method is important for the construction of an automatic air-conditioner adjuster for automobile.

1.3 Objectives

The objectives of this project are as follows:

- To develop a system that can monitor the temperature and humidity variation in a car
- To determine the suitable setting of air-conditioning adjuster according to occupant comfortable temperature and humidity variation
- To analyze the effect of temperature & humidity variation outside of car towards temperature & humidity variation inside car

1.4 Scope of Work

This project required certain aspects for the implementation of the monitoring system. The first scope covered in this project are four conditions at different time block in a day. The constructed monitoring system will be tested at vary conditions defined as morning, noon, evening and midnight. This is because the temperature and humidity in an automobile for these four time block is different. Thus, this monitoring system need to measure the possible value of temperature and humidity variation in an automobile for each condition for further analysis.

Moreover, the measured temperature and humidity variation in automobile for each condition are also the scope that will be covered in this project. The measured temperature and humidity variation is the data collected from the monitoring system. In addition, the data are obtained from the measurement taken in an automobile before and after adjusting the air-conditioner adjuster. The data collect before adjusting the air-conditioner adjuster defined as data collected at default condition. While the data collected after adjusting the air-conditioner adjuster defined as data collected at acceptable condition.

This project required specific electronic component for the construction of the monitoring system. The main component important for the expected functionality of the monitoring system is the temperature and humidity sensor. Thus, DHT11 sensor is one of the scope that will be covered in this project. The data obtained from the monitoring system will be depends on DHT11. This is because the main objective of this project in to measure the temperature and humidity variation in automobile. So, this project uses three DHT11 sensor that will be placed in the automobile at different position in the automobile.

This monitoring system circuit will be tested in an automobile defined as a car with air-conditioner at the front side only. So, all data collected are obtained from the test conducted in the same car. The car can be said as the constant variable in this project. Thus, the car used in this project is considered as one of the scope of work in this project.

Last but not least, scope that will be covered in this project is the duration of the test conducted. The test for this monitoring system will be conducted for a week in order to obtain a better analysis in determining the average temperature and

humidity variation required for different condition in a day. As been stated earlier that the monitoring system will be test in automobile to obtain the data at default and acceptant condition at different time block in a day. So, the average temperature and humidity variation can be discover from the data collected.

1.5 Project Significant

The significance of this project can be observed in three aspects which are in economy, society and environment.

Main idea of this project is to design a monitoring system inside automobile to monitor the changes in temperature and humidity variation in automobile when the weather and time block changing from time to time. Thus, the application of this monitoring system circuit will be focusing on measuring the environment in automobile. In addition, this project is mainly design to implement in an automobile such as car, bus or even lorry. Since the future aim of this project is to create an automatic air-conditioner adjuster, so the application of the monitoring system of this project can be said as a monitor and controller of the environment inside automobile to generate the functionality of the automatic air-conditioner adjuster. As a view of commercialization potential in economy, this monitoring system is suitable to be commercialize to Transportation Company. Thus, this monitoring system able to sustain in future because this monitoring system is important for the functionality of automatic air-conditioner adjuster.

As been stated that the future aim of this monitoring system is to create an automatic air-conditioner adjuster, so this future aim project will provide drivers with