AIR QUALITY MONITORING SYSTEM (FRONT-END) USING FPGA

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MOHAMMAD SHAMSUL BIN TAIP
2006686239
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)
40450 SHAH ALAM
SELANGOR DARUL EHSAN

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ABSTRACT

This thesis presents development of Air Quality Monitoring System that might helps government or any industries to monitor the amount of poisonous gases or air pollutants emitted in the air in order to have a safe environment. This system focuses on the development of Graphical User Interface (GUI) menu for user to activate certain sensors and display the results on FPGA (Field Programmable Gate Array) Development Board. The output from sensor circuit acts as input to the FPGA board. The FPGA, which is programmed by using VHSIC hardware description language (VHDL) code, displays the sensor's output thru LED and seven segment display.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Air Quality Monitoring System is a user-friendly system that can give information such as temperature, CO_2 content and humidity. In this monitoring system, temperature and humidity are monitored.

Temperature plays an important role in keeping the earth balance and in order in term of climate. Changes in temperature which increase gradually over the years will have a significant effect on human physical health in a long run [1]. Such increase will lead to a major climate change. Thus, increase the incidence of heat waves and extreme hot phenomenon. Extreme heat waves during the summer while less cold spells produced during the rainy season are among the effects experienced by the affected countries due to the increase in temperature [2].

Humidity is defined as the amount of moisture in the air measured as the percentage of total amount of moisture the air can hold at a particular temperature. The ideal relative humidity for a typical home is between 35% and 45%, too much above or below these levels will lead to problems. In concern of physical health, a relative humidity that is too low could lead to sore throats, sinus congestion and skin disorders for the occupants. At high relative humidity, it does not affect the human health directly but indirectly. At this high level, it can cause the growth of micro-organisms (mold, etc) – due to condensation