

MEASURING AIR QUALITY USING ARDUINO VIA APC220 RADIO DATA MODULE

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ABSTRACT

The thesis is to present and design a device that could monitor air quality in a certain place even in indoor or outdoor for human healthcare. This device could detect a Particulate Matter 2.5 (PM2.5) for an air quality in the area. This paper presents the system development by using Matlab for graphical indicator, and using Arduino UNO as an input/output data to detect dust and gas quality. Using the Arduino device, it uses Optical Sharp Dust Sensor to measure air quality for existence of a dust. Also using an analog gas sensor (QM-NG1) for detecting hydrogen that could give out an alarm for a gas leak. And its uses LM35 to measure a temperature at a measured place. For this prototype, this paper proposes using APC220 as a connection between prototype and serial main monitor on a computer by using RF wireless radio connection. All the value has been mentioned will be interpreted in MATLAB. This research project is useful for air quality for department of environment.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Air supplies us with oxygen which is essential for our bodies to live, it contains 99.99% of nitrogen, oxygen, water vapor, combustion gas. Air is precious that most of us take for granted. Air supplies oxygen, which is important to our bodies. In 99.99% pure air contains 78% of nitrogen, 21% oxygen, and another 0.99% contains argon, carbon dioxide and other gases[1]. Our time at indoor in school, at office, or at home can put us to breathing risk. Some pollutants that could be chemical, germs, dust, living organism, molds, radon and rodents can cause a health problem to human such as sore eyes, breathing problems, burning the mouth or throats, dizziness, fatigue and headaches. The worst case scenario could be asthma, acute respiratory system, heart disease, or even lung cancer in long terms. This paper shows how to design a system that could precisely measure a density of dust without going to the exact place. The prototype use radio frequency (APC220) for wireless connection.

Air quality can be expressed by concentration of several pollutants such as carbon monoxide, sulfur dioxide, nitrogen dioxide and ozone. The threshold values specified by the EEA for these pollutants are 10mg/m³, 350µg/m³, 40µg/m³, and 120µg/m³ respectively.[1] Generally, industrialized country nowadays the population citizen is spending about 80% to 90% of the time inside the building, so people are exposed to harmful indoor pollutants.