

ABSTRACT

Polluted air in closed areas such as indoors turns out to be very dangerous for human health because in general, humans spend a lot of time doing activities indoors such as indoors. The condition of indoor air pollution is exacerbated by the entry of polluted air from outside through the ventilation in the house. Decreasing air quality due to air pollution can be caused by temperature, humidity, PM_{10} , and CO_2 . In this final project research, a prototype is designed that is able to monitor air quality based on IoT and condition automatic air circulation through detection of temperature parameters, PM_{10} , and CO_2 . These pollutants are always in the room so this parameter needs to be detected and conditioned, because it can cause respiratory infections if not conditioned.

Through this research, the results obtained in the form of using IoT in monitoring the sensor value data of DS18B20, GY-BME280, PMS5003, and MQ-135 can be accessed easily by users through the Thingspeak website and the Pocket IoT application on smartphones with android system operation, and the system is able to detect parameters air temperature, humidity, PM_{10} , and CO_2 . The time required for the actuator to condition hot (5 minutes 23 seconds), cold (1 minute 23 seconds), PM_{10} (1 minute 23 seconds), and CO_2 (13 seconds) air pollutants and the average humidity of the air in the temperature pollutant application test is 46.81% RH, giving PM_{10} pollutants is 65.25% RH, and giving CO_2 pollutants is 64.61% RH. Testing tools and systems from prototype automatic air monitoring and air conditioning systems through IoT-based physical and chemical air quality detection using the closed loop method results in suitability of actuators that are able to condition polluted air in less than 10 minutes on target. The average time required by the tool to send sensor value data to the Thingspeak database is about 16.35 seconds in serial communication and has an accuracy of 99.65% data transmission.

Keywords : Physical air quality, chemical air quality, Air Conditioning, Closed Loop Control System, Thingspeak, Pocket IoT.