

Air Conditioning System Comfort Level and Power Consumption Monitoring Device with RF-Based Wireless Sensor Modules and Android Mobile Application(Book Chapter)

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Abstract:

Nowadays, electric consumption especially in Malaysia has increased over the years caused by the usage of air conditioning (AC). Conventional AC remote devices are unable to monitor the actual comfort index of the building and the power consumption that has been used of the system by using Android mobile applications. Knowing the actual comfort index and power consumption is necessary for the user to come up with strategies to use the AC system economically. Besides, conventional AC remote devices do not have temperature and humidity sensors that can monitor the comfort index and power consumption. Users do not know the actual comfort level and power consumption, thus causing discomfort and maybe waste of energy. To overcome these problems, an air conditioning system comfort level and power consumption monitoring device with RF-based wireless sensor modules and Android mobile application were produced. Indoor air quality (IAQ) and predicted mean vote (PMV) are the types of comfort index that have been used to measure the comfort level. In this project, the methods used for completing the project of monitoring the air conditioning system by using the predicted mean vote (PMV) algorithm. PMV has six parameters, which are the air temperature, mean radiant temperature, clothing insulation, metabolism rate, relative air velocity and relative air humidity. This monitoring system can monitor various variables at the same time such as the indoor temperature, outdoor temperature, relative temperature, relative humidity, PMV and power consumption. With a monitoring system, the energy consumption can be minimized while retaining the comfort level. In this project, a monitor box, wireless humidity sensor box and wireless temperature sensor box were produced. This research elaborates on the entire process of hardware design. It also discusses the software developed for monitoring parameters such as the power consumption using a mobile phone. The AC system can be better monitored and controlled with the developed tool in this project. © 2022, The Author(s), under exclusive license to Springer Nature Switzerland AG.

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