

Internet of Things for Smart Dedicated Outdoor Air System in Buildings

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Abstract : Recently, the Internet of Things (IoT) is the important technology that connects devices to the network and people can access real-time communication. This technology is used to report, collect, and analyze the big data for achieving a purpose. For a smart building, there are many IoT technologies that enable management and building operators to improve occupant thermal comfort, indoor air quality, and building energy efficiency. In this research, we propose monitoring and controlling performance of a smart dedicated outdoor air system (SDOAS) based on IoT platform. The SDOAS was specifically designed with the desiccant unit and thermoelectric module. The designed system was intended to monitor, notify, and control indoor environmental factors such as temperature, humidity, and carbon dioxide (CO₂) level. The SDOAS was tested under the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE 62.2) and indoor air quality standard. The system will notify the user by Blynk notification when the status of the building is uncomfortable or tolerable limits are reached according to the conditions that were set. The user can then control the system via a Blynk application on a smartphone. The experimental result indicates that the temperature and humidity of indoor fresh air in the comfort zone are approximately 26 degree Celsius and 58% respectively. Furthermore, the CO₂ level was controlled lower than 1000 ppm by indoor air quality standard condition. Therefore, the proposed system can efficiently work and be easy to use for buildings.

Keywords : internet of things, indoor air quality, smart dedicated outdoor air system, thermal comfort

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