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Domestic and Commercial LED Lighting System Considering Low Power Consumption using Intellectual Property

Sunil R. Mali, Prashant R. Rothe
[1,2]Priyadarshani College of Engineering Nagpur,Maharastra, India

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Abstract

Saving energy has become one of the most important issues these days. The most waste of energy is caused by the inefficient use of the consumer electronics. Particularly, a light accounts for a great part of the total energy consumption. Various light control systems are introduced in current markets, because the installed lighting systems are outdated and energy-inefficient. However, due to architectural limitations, the existing light control systems cannot be successfully applied to home and office buildings. Therefore, this paper proposes an Domestic and commercial LED Lighting System Considering low power consumption using intellectual property. The proposed system utilizes multi sensors and wireless communication technology in order to control an LED light according to the user's state and the surroundings. The proposed LED lighting system can autonomously adjust the minimum light intensity value to enhance both energy efficiency and user satisfaction. We designed and implemented the proposed system in the test bed and measured total power consumption to verify the performance. Our main purpose is to provide the end consumer with an economical fully centralized system in which home appliances are managed by an IEEE 802.15.4- based wireless sensor network. Not only is it necessary to focus on the initial investment, but maintenance and energy consumption costs must also be considered. This paper explains the developed system along with a brief introduction to usual building automation protocols. The proposed LED lighting system reduces total power consumption of the test bed up to 31%.

Keyword: minimum light intensity control, Building Automation, DALI, Wireless Sensor Networks, IEEE 802.15.4