

SRESLi: SMART RENEWABLE ENERGY STREET LIGHTING SYSTEM

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ABSTRACT

Conventional street lighting systems do not allow controlling the light intensity depending on the traffic of pedestrians or vehicles, only operate in two automatic modes (on/off) according to the availability of daylight and consume enormous amounts of electric energy. In this article, we describe the design, development and implementation of a new intelligent street lighting system that is based on LED technology, an energy-efficient embedded wireless control device (hardware) designed from scratch, and photovoltaic solar energy. The embedded device includes specialized firmware and an energy-efficient wireless communication protocol, that allows to form a network of infrared sensors to detect pedestrians and vehicles, so as to control and dim the LED luminaires. We implemented a pilot system in a back road of the campus of Universidad Privada Boliviana, in the city of Cochabamba, Bolivia, where energy consumption measurements confirm energy savings of 72.8% thanks to the developed intelligent control system.

Keywords: Street Lighting System, Photovoltaic System, Intelligent Wireless Control System, Energy Efficiency.

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