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STANDALONE PV SOLAR USING LED FLOOD LIGHT FOR STREET LIGHTING

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ABSTRACT

Maximum power point tracking (MPPT) is a technique to extract maximum energy from the photovoltaic (PV) system. This work presents the designing and simulating the PV modules by using Perturb and Observe algorithm to track maximum power point. To develop PV system with this P&O algorithm, this system is constructed and simulates using MATLAB Simulink software. The hardware process of this project is implemented by using Arduino, for verification of the results. This design includes PV panels, boost converter, charge controller and Led load.

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INTRODUCTION

1.1 BACKGROUND OF STUDY

Renewable energy resources will be an increasingly important part of power generation in the new era. This renewable energy help in reduction of the emission of greenhouse gasses, they add the much-need flexibility to the energy resource mix by decreasing the dependency on fossil fuels [1]. Many types of natural sources can be used to generate electricity. The sources include solar, wind, geothermal, biomass and fuels. Among the available alternative energies, photovoltaic (PV) energy is one of the most promising renewable energies. PV energy is simple in design and require very little maintenance. One of the biggest advantages of PV system is, their construction that is standalone systems which give output from microwatts to megawatts. Hence the output power will be used for electrical applications such as, remote buildings, water pumping, solar home systems, communications, space vehicles and satellites and even for megawatt scale power plant [2].

The PV application can be grouped according to the scheme of interaction with utility grid: standalone, hybrid, and grid connected. PV system consist of a PV generator (module, cell, and array), energy storage devices such as batteries, AC and DC consumers and elements for power conditioning. The most common method uses the PV cells in grid network.

A lot of maximum power point tracking (MPPT) algorithm have been developed and proposed for photovoltaic (PV) system to maximize the output energy. Since the PV arrays output power depends on variance of solar irradiance, temperature and loads, the maximum power point tracking (MPPT) technology is important to apply. This technology help to obtain maximum output power of PV arrays [3]. This