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Dual Axis Solar Tracking System

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A B S T R A C T

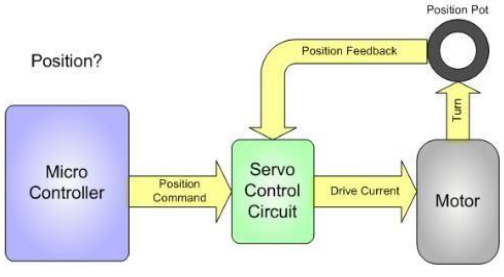
The purpose of this thesis was to create a lab prototype of a sun tracking system that can improve the performance of photovoltaic modules in a solar energy system. The device's operational idea is to keep photovoltaic modules aligned with sunbeams at all times, maximizing solar panel exposure to the Sun's radiation. As a result, the solar panel may provide greater output power. The project includes hardware design and implementation, as well as software development for the solar tracker's microcontroller unit. An ATmega328P microcontroller was used to control the movements of two servo motors that rotated the solar panel in two axes. The microprocessor calculated the amount of rotation based on data collected from four photo sensors near the solar panel.A working solar tracking system was built and implemented towards the end of the project. It was able to repeatedly align the solar panel with the sun or any other light source. The solar tracker design from this project serves as a model and a starting point for future development of more complex systems

Keywords:Dual Axis Solar Tracking System

1. Introduction

The greatest sun rays are tracked via a dual axis solar tracking system.This panel moves in the direction of the sun without the need for manual operation.The solar tracker produces extra energy, which we use as solar energy. Renewable energy sources have been a topic of interest for researchers, technologists, investors, and decision makers all around the world due to the unavoidable future lack of fossil fuel sources. Hydroelectricity, bioenergy, solar, wind, and geothermal energy, as well as tidal and wave power, are all new kinds of energy that are gaining traction. They are seen as viable alternatives to fossil fuels due to their ability to be replenished. Solar photovoltaic (PV) energy is one of the most readily available of these types of energy. Thanks to research and development efforts to improve the performance and lower the cost of solar cells, this technology is currently being embraced more widely for residential usage. Since the early 2000s, global PV capacity has expanded at a rate of 49 percent per year on average, according to the International Energy Agency (IEA). Solar photovoltaic energy is predicted to become a major power source in the future.

2. Structural diagram



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3. Working

The sun's angular height position is tracked as well as the sun's east-west movement via a dual axis solar tracking device.The dual-axis collects solar energy more effectively than a single axis by spinning its axis along vertical and horizontal axes

4.Application

1.solar water heating

.2.solar heating of building.

3.solar distillation

.4.solar furnaces.

5.solar cooking.

6.solar electric power generation

7. solar pumping

8..solar drying of agricultural and animal products.

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