NKOSITHANDILEB SOLAR

Solar energy automatic principle

Overview

Two types of solar panels are currently in use. Fixed panels; where they are placed at a convenient angle depending on the geographical location with a fixed tilt angle. But irradiation time merely exceeds six hours/day. The second type is rot. Two types of solar panels are currently in use. Fixed panels; where they are placed at a convenient angle depending on the geographical location with a fixed tilt angle. But irradiation time merely exceeds six hours/day. The second type is rotating panels, either by continuously tracking the sun or through a preprogrammed angle at preprogrammed time. Unfortunately, both schemes, continuous tracking or pre-programmed are inefficient. In the first one, motor running at a very low speed requires a high torque which requires high current, leading to more driving power. In the second scheme, the system rotates at predetermined small angles independently whether the new position contributes to extra energy or not. In fact, it may have the opposite effect where all the extracted energy could be consumed by the drivin.

••Solar energy is maximized by exposing the panel to irradiation for maximum time.••Energy consumption by the drive is kept to its minimal.••Technique could help in designing future optimized panel.••A considerable improvement in solar efficiency is feasible.

Solar cellPANELPILOTPIC microcontrollerLDRLTF.

With the scarcity of fossil fuel as well as its warming effect on the environment, and the great danger posed by nuclear energy, such that suffered by Chernobyl nuclear disaster in 1986 and Fukushima nuclear disaster after the 15 m tsunami that hit Japan’s coast, on March the 11th, 2011, and despite being rated to be highly safe, researchers have been looking for safe and cost effective alternative ways. They returned their attention towards renewable energy such as wind, waves, heat, solar just to name a few. But amongst them all, probably solar energy has become more popular and has more chance to survive due to its abundance and decreasing cost and availability of its technology. But solar energy suffers from several drawbacks; up to recently its efficiency is considerably low. The cost was considerably high and mos.

Despite the intensive research to maximize energy extraction by orienting the panels towards the sun, by continuously rotating the solar panels in order to track the sun, a major problem still remains. That is: to rotate thousands of panels, electric motors are required. Those motors draw very high currents to

produce high starting torque especially at the start of rotation in order to overcome the panel’s inertia. It is well known that in a DC motor, the torque is proportional to the armature current provided the excitation field is kept constant, according to Eq. (1) (1)T=KϕIawhere T is the torque in N m, K is constant depending on the coil geometry, ϕ is the flux in Weber, and Ia is the armature current in Amperes. It could also be noticed that to reduce the torque, hence the armature current, one needs to increase t.

How does an automatic solar system work?

Automatic STS rely on accurate sun tracking, which can be affected by environmental factors such as clouds, haze, and shading from nearby structures or vegetation. These factors can impact the system’s ability to track the sun accurately and affect energy generation.

How a solar ray automatic tracking system works?

This paper designs a biaxial solar ray automatic tracking system, which combines sun-path tracking with photoelectric detection tracking. When the system is running, the weather condition is judged by photosensitive resistance at first. The cloudy day adopted the sun-path tracking by getting the time date in the clock module.

How do solar panels generate energy?

ar energy through solar panels. For this, a digital-based automatic sun tracking system and PPT circuit are being proposed. The solar panel traces the sun from east to west automatically for maximum intensity of light. PV generation system generally uses a microcontroller-based charge controlle.

What is automatic solar tracking?

The main aim of any automatic STS is to maximize the amount of sunlight that the solar concentrator or module will receive, resulting in the maximization of the overall energy outputs of the system. Solar tracking can be performed in two ways: single-axis tracking and double-axis tracking.

Solar energy automatic principle

Automatic STS rely on accurate sun tracking, which can be affected by environmental factors such as clouds, haze, and shading from nearby structures or vegetation. These factors can impact the system's ability to track the sun accurately and affect energy generation.

This paper designs a biaxial solar ray automatic tracking system, which combines sun-path tracking with photoelectric detection tracking. When the system is running, the weather condition is judged by photosensitive resistance at first. The cloudy day adopted the sun-path tracking by getting the time date in the clock module.

ar energy through solar panels. For this, a digital-based automatic sun tracking system and PPT circuit are being proposed. The solar panel traces the sun from east to west automatically for maximum intensity of light. PV generation system generally uses a microcontroller-based charge controlle

The main aim of any automatic STS is to maximize the amount of sunlight that the solar concentrator or module will receive, resulting in the maximization of the overall energy outputs of the system. Solar tracking can be performed in two ways: single-axis tracking and double-axis tracking.

This paper introduces the design and development of an automatic solar tracking system aimed at optimizing the efficiency of solar energy collection.

It offers a vast opportunity for public and private organizations to reduce carbon emissions and cut electricity costs. A viable approach to maximizing the solar panel efficiency ...

Light Dependent Resistor (LDR), a comparator and an Arduino UNO. Thi s paper presents the design and Fabrication of the ...

Objective of Study The project aims to utilize maximum solar energy through solar panels. For this, a digital-based automatic sun tracking system and MPPT circuit are being ...

solar energy has become an increasingly important and popular renewable energy source. By using a solar tracking system, we can produce an abundance of energy and ...

Research paper Single axis automatic tracking system based on PILOT scheme to control the solar panel to optimize solar energy extraction

Abstract To improve the photovoltaic conversion efficiency of solar energy, promote the development of photovoltaic industry and alleviate the pressure of energy shortage. This paper ...

Our experimental investigation provides valuable insights into the performance of the automatic solar tracking system, which is crucial for understanding its effectiveness in ...

This Simulink model implements a hybrid wind-solar power conversion system supplying a single-phase AC load. A three-phase wind generator feeds a diode bridge rectifier ...

Abstract An automatic solar tracking system is an approach for optimizing the generation of solar power and modifying the angles and direction of a solar panel by ...

Light Dependent Resistor (LDR), a comparator and an Arduino UNO. Thi s paper presents the design and Fabrication of the automatic solar tracking device. The model is ...

Contact Us

For catalog requests, pricing, or partnerships, please contact:

NKOSITHANDILEB SOLAR

Phone: +27-11-934-5771

Email: info@nkosithandileb.co.za

Website: https://www.nkosithandileb.co.za

Scan QR code to visit our website: