IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 12, Issue 4, April 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 | Monthly Peer Reviewed & Referred Journal |

|| Volume 12, Issue 4, April 2024 ||

| DOI: 10.15680/IJIRCCE.2024.1204169 |

Dual Axis Solar Tracker Dc Generation System with Inverter

Pratiksha Maindad[1], Basari Chavan[2], Nilofer Attar[3] , Prof. Sujata Patil [4]

Student, Dept. of Electronics and Tele-Communication, JSPM Imperial College of Engineering, Pune, Maharashtra, India[1]

Student, Dept. of Electronics and Tele-Communication, JSPM Imperial College of Engineering, Pune, Maharashtra, India[2]

Student, Dept. of Electronics and Tele-Communication, JSPM Imperial College of Engineering, Pune, Maharashtra, India[3]

Professor, Dept. of Electronics and Tele-Communication, JSPM Imperial College of Engineering, Pune, Maharashtra, India[4]

Abstract: the need to capture renewable energy supplies arises from both global warming and energy depletion. Among the most promising renewable energy sources is solar energy. Sun trackers can significantly increase a photovoltaic (PV) system's ability to produce electricity. In order to offer reliable system performance, this project suggests an oval design for a dual-axis sun tracking photovoltaic system. It makes use of the feedback control principle, a four-quadrant light-dependent resistor (LDR) sensor, and straightforward electrical circuitry. To achieve solar tracking, the suggested system makes use of a special dual-axis AC motor and a standalone PV inverter. The control implementation is a straightforward and efficient technical innovation. A large number of scientists and researchers are creating different computation techniques to gather the greatest solar radiation and to maximize the solar panel's electric power extraction. Our team created a solar tracking technology that maximizes the power output of a photovoltaic module.

I. INTRODUCTION

As everyone knows, the need for energy is growing as a result of the population's constant growth. Both the over use of resources and the usage of fossil fuels contribute to environmental damage and resource depletion. Renewable energy sources are non-polluting and clean energy sources in this age of energy challenges. biomass, solar, wind, and tidal energy, among other renewable energy sources. Solar power is the most promising source. Photovoltaic panels can be used to convert solar energy into electrical power. A solar panel's fixed position limits the quantity of energy that the photovoltaic system can collect. PV systems must track the sun throughout the day in order to collect the most solar energy possible, which can be realized by the sun tracking mechanism. The inverter uses a sophisticated electrical adjustment technique to do this. AC electric power is generated as a result of this procedure. An electric light can be powered by this type of electricity. The current needs to be reduced in order to raise the voltage. Therefore, even though an inverter is only using a little amount of current on the AC side, it will use a large amount on the DC side. Here, sine waves were used wave inverters to generate high-grade AC power. They are costly because they generate a genuine sine wave through the use of pulse-width modulation (PWM).

1.1. MOTIVATION

Many scientists and researchers are working on developing various methods of calculating to collect the maximum solar radiation and to optimize the electric power extracted from the photovoltaic panel. We proposed a solar tracking system for extracting the maximum power from a photovoltaic module.

II. PROBLEM STATEMENT

Here, the solar panel—which is limited to fixed installations—is the source of the issue. The power that can be produced is limited as a result of these issues. A complete 180-degree rotation can be detected by this sun tracking technology. In contrast to solar panels that are limited to one direction, the solar panel that can produce power here is

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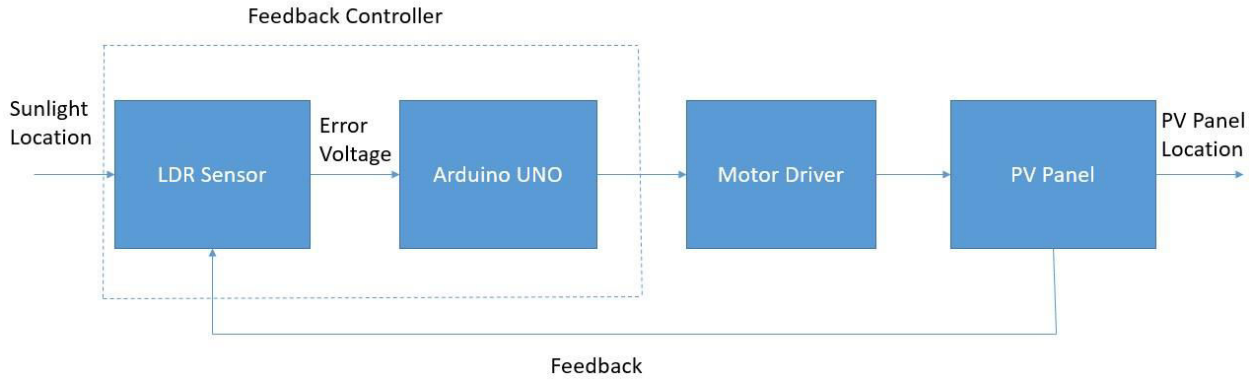
quite high. The earth's continual motion causes the stationary solar panels to not point directly toward the sun. Consequently, this device does not produce the maximum amount of electricity that it should.

III. WORKING



Description:

1.In the suggested project, we will employ dual-axis solar trackers, which may move in two distinct directions and continuously face the sun. Single-axis solar trackers rotate on one axis, traveling back and forth in a single direction.

2.To track the precise location of the sun, two pairs of sensors and an LDR are employed. One pair detects the sun's location along the vertical axis, or east and west, while the other pair detects it along the horizontal axis, or north to south.

3.The Arduino receives the data and uses it to determine which way the motors will travel on the vertical and horizontal axes.

4.The battery or inverter will start using the generated electricity, which can be utilized for a number of purpose

IV. BLOCK DIAGRAM

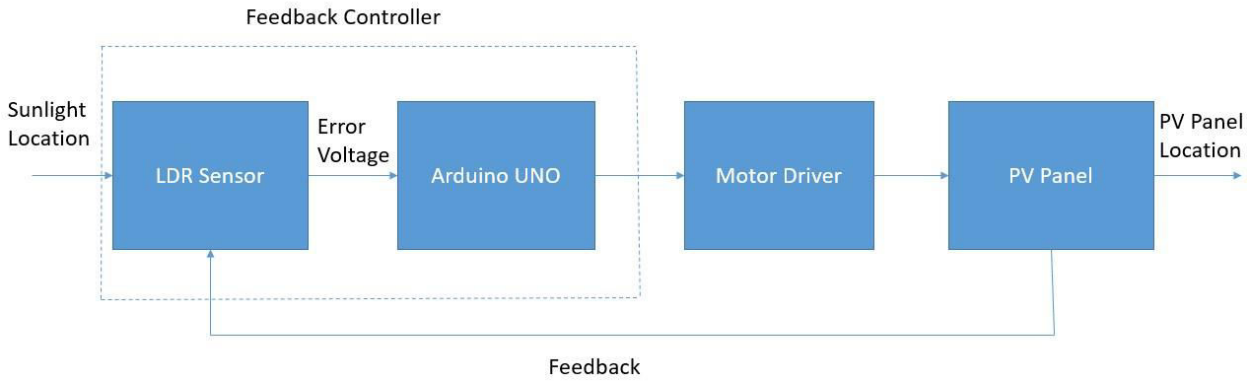


Fig1 Block Diagram

Description:

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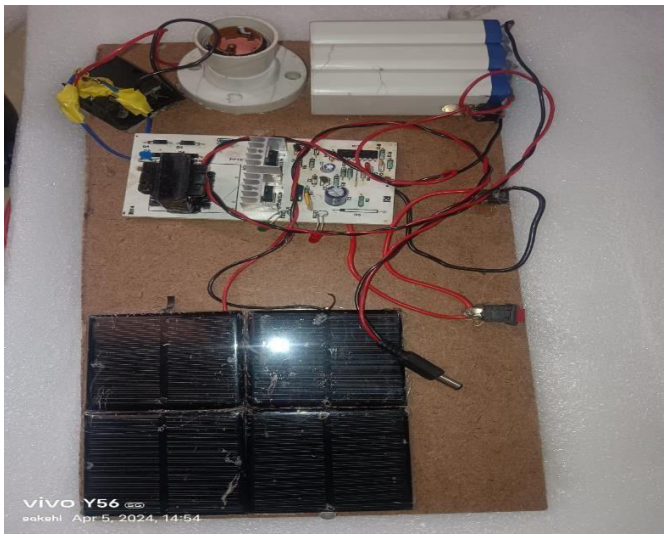
V. RESULT



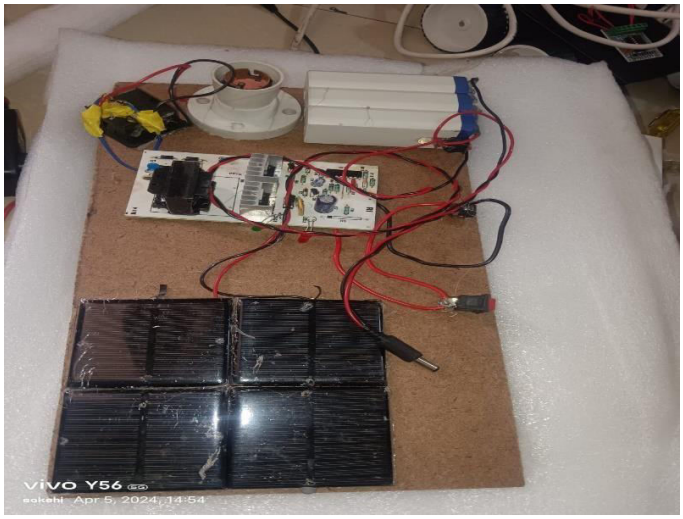


Fig.1) Inverter

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Fig.2) Dual Axis Solar

VI. CONCLUSION

Since the Sun might travel in two different directions, we have to present a control implementation of a Sun tracker that uses a dual-axis motor to follow the Sun. Here, we're using the Arduino to figure out which way the motor is moving. With the help of this tracker, the suggested system's solar panel captures more energy than a fixed panel system, resulting in high efficiency. With this extra energy, we may store an inverter or battery. We can then use this energy for a variety of things. The designed technology shows that energy gain was raised to a partially cloudy day. Thus far, the suggested methodology is novel.

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INTERNATIONAL STANDARD SERIAL NUMBER INDIA

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