

# INCESSANT SOLAR ENERGY HARVESTER FOR UNINTERRUPTED POWER SUPPLY

<sup>1</sup> Senthamilarasu S, <sup>2</sup> Madhumitha M, <sup>3</sup> Gayathri N, <sup>4</sup> Devika M, <sup>5</sup> Kuralarasi D

<sup>1</sup> Assistant professor, <sup>2,3,4,5</sup> Student scholar

Department of Electronics and Communication Engineering,  
P A College of Engineering and Technology, Coimbatore, India

**Abstract:** In all intents and purposes, contrary to common assumption, rising power demand prompts young brains to seek out alternate solutions using multiple techniques. Solar is a prominent energy source for generating power, which is relatively substantial, among the numerous methods of conventional power generation. However, the availability of the same is essentially limited to the daytime and is, in some ways, heavily influenced by monsoon changes. This work proposes an alternate approach to explicitly handle this problem utilizing IR sensors, which is highly significant. The IR blaster, which is essentially a grid configuration, can be utilized to power the solar panel during the night and even during monsoon days. Basically contrary to popular belief. This work actually analyses the efficiency and driving capacity of the IR grid used for power generation, or so they for the most part thought.

**Keywords:** Solar Power Harvester, IR Blasters, Uninterrupted Power Supply, Solar Panel Tracking

## I. INTRODUCTION

Solar energy is the light and radiant heat from the Sun that influences the climate and weather on Earth and helps to keep life alive. Solar power is a term that can be used interchangeably with solar energy or to refer to electricity generated by solar radiation. Many ways have been explored to gather solar energy for human use since ancient times. The majority of the world's renewable energy flow comes from solar radiation, Solar energy systems can supply electrical production, space heating and cooling in active and passive solar buildings, drinkable water via distillation and disinfection, day illumination, hot water, thermal energy for cooking, and high temperature process heat for industrial use.

## II. MOTIVATION

In a traditional setup, there is still a lot of wire to deal with it. Humans are not allowed near some dual source processes because they may be dangerous. Manual operation is used in the proposed system to record metre readings. There is minimal space required, there is no pollution, there is great efficiency, there is reduced power loss, and energy is created in all four seasons. The software technology is employed in the implementation of day/night battery charging. So, the main goal of this study is to use an IR blaster to provide solar power generation even at night.

## III. LITERATURE SURVEY

In this report range, this chapter provides the existing and established theory and study. This will provide background for the upcoming assignment. This will clarify the system's depth. A literature review clarifies and improves comprehension of the exploration/venture. A literature survey is an examination of previously published material on the subject of the report.

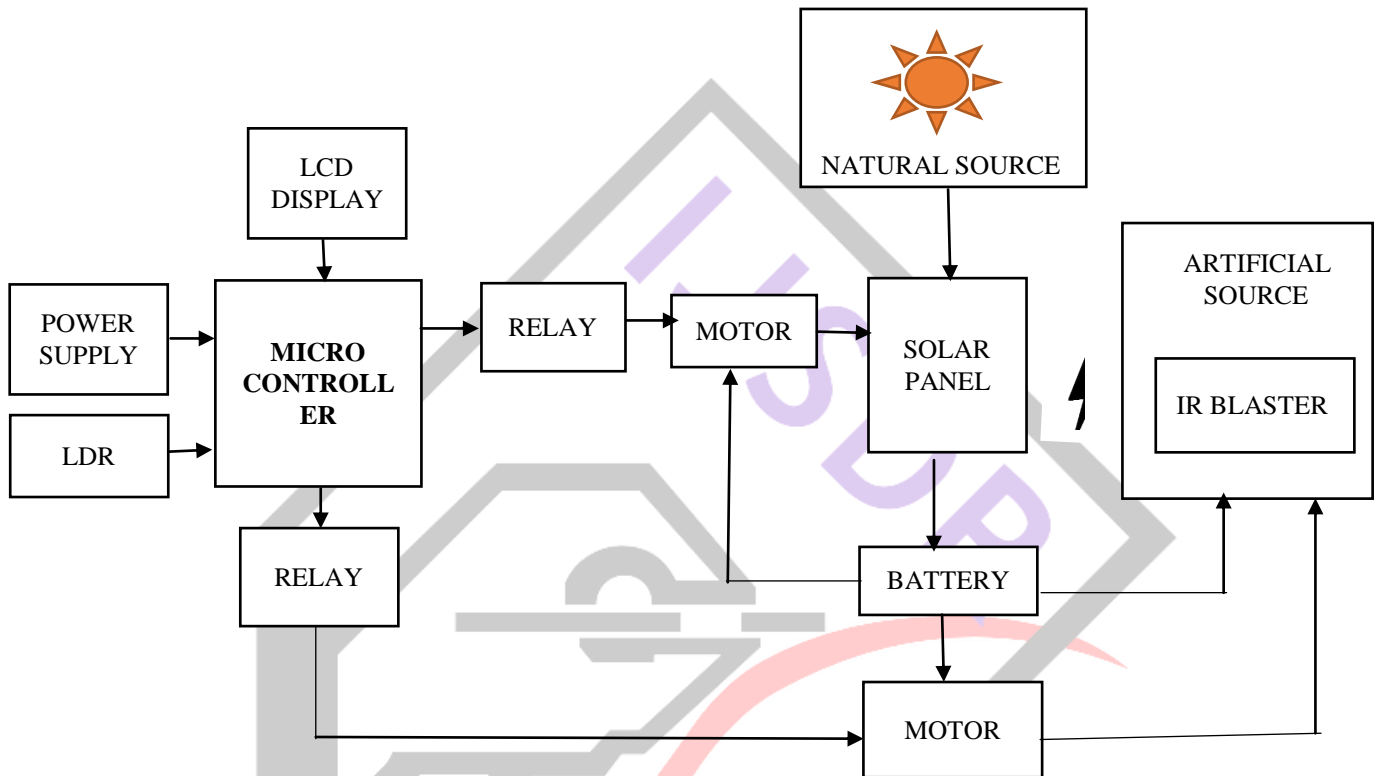
In this article [2] author discussed about different reflector materials used for concentrated solar energy, and the methodology is mainly concentrated on reflected materials. And the main advantage of this process is the solar energy can be utilized directly, and the development is easy. The authors described an experiment in solar-powered electricity generating [6]. The methodology of this process is producing the electric generation from natural source, and it saves solar energy up to 20%. And cost of this is low, and the main advantage it can use in remote location. The results of experimental research on solar power operations with a capacity of 150 watts are presented in this article [7]. Which experimental investigation was carried out in the form of a modification in the angle inclination of the solar panel. Solar energy is the most energy efficient in terms of autonomous electricity supply, according to a research of traditional and non-traditional energy sources. Collecting the energy from solar panel is easy. The authors conducted research on infrared scanning of photo voltaic solar plant [8]. The main methodology is infrared scanning. Infrared scanning is a noninversion substation inspection technique. And this methodology was easy and low cost. It detects high quantities of heat using a thermal imaging camera. The author used UAV photogrammetry to conduct heat infrared and visual inspections of solar installations [10]. They also created an infrared-ray-based visual evaluation. In this inquiry, the procedure was straightforward, and the method was followed.

**IV. PROPOSED SYSTEM**

The battery is attached to the solar panel. The Arduino UNO micro controller is powered up with the help of battery, and the peripherals are linked to it. The LDR detects the day and night time and informs the micro controller. The DC geared motor closes the solar panel door automatically until the limit switch is hit when it is closed at night. When the limit switch is pushed, the motor comes to a complete halt. The solar panel door will open if it is day time

**SOLAR TRACKER:**

The solar elevation tracker is a closed loop control system that covers both fields of electronics and mechanical engineering. This system is used to position solar panels to track the natural source to achieve higher efficiency of power generation. The electrical system's components, such as the control unit and relay unit, include a Micro controller logic circuits, a Comparator, a DC motor, a relay, cadmium Sulphide photo conducting cells (photo sensors), and a Transformer.



**Fig. 1 SYSTEM ARCHITECTURE**

**COMPARATOR UNIT:**

LM324 operational amplifier used here. It comprises of four internally compensated high-gain operational amplifiers that can run across a wide voltage range using a single power source. Because low power supply current drain is independent of power supply voltage, multiple power sources can be used.

**LIGHT SENSOR:**

Light sensors are a typical type of sensor. The photo resistor, which is built of cadmium sulphide (CdS) or gallium arsenic, is the most basic optical sensor (Ga As). The photo transistor is the next degree of complexity after the photo diode. A cadmium sulphide (CdS) photocell detects light in the sun tracker. This is the most basic and cost-effective light sensor. The LDR is a resistor whose resistance lowers as light intensity increases. A photo resistor is a semiconductor with a high resistance. The liberated electron and its hole partner that results carry electricity, lowering resistance. the other side, when darkness falls on the LDR, it becomes more resistant. This attribute is used to adjust the input voltage to the comparator as the sun moves across the LDR.

**CREATING VARIYING VOLTAGE USING AN LDR:**

By connecting the LDR in series with a resistor and dividing the voltage Vcc in half, a voltage divider is created. The LDR's resistance increases as darkness falls.  $V=IR$  is an often used formula. When R rises while I remains constant, V rises as well.  $V^2$

rises as a result of the Kirchhoff voltage rule, while  $V_1$  decreases. The voltage at the inverting input begins to decline as the darkness develops, eventually falling below that of the non-inverting input.

### HOW THIS IS USED TO ACCOMPLISH THE TRACKER:

Three of the comparators are used here. They are used to locate the sun's rays; both LDR's are positioned on a flat platform separated by a barrier. The arrows indicate the solar finder's rotational direction. When the sun is at its typical position (i.e. when both LDR see light), the comparator's output is expected to be low, and the control unit, which will be discussed later, will not execute any operations. The system will rotate to the right until both LDR see light again if the barrier casts its shadow on LDR1 as the sun moves to the right. When the sun sets, both LDR will experience darkness, and the system will not rotate, remaining in that position till the next day. When the sun rises, the final LDR beneath the platform detects the sun's light, causing the system to rotate back to the left (Eastward). This movement will continue until both LDR on top of the platform detect light once more.

### CONTROL UNIT:

A crystal oscillator, a reset capacitor, and a  $V_{cc}$ -connected enabling pin make up this micro controller (Pin 31). The project required a micro controller that could convert analogue photocell voltage to digital values as well as offer motor rotation output channels. This was done to limit the motor's speed, as well as the mechanical unit's, ensuring that the system travels slowly. This has the advantage of preventing the system from overshooting the sun's movement.

### V. RESULT ANALYSIS:

The experiment's results are listed below as a comparison. It contains the amount of charge Before and after charging of solar panel and IR grid.

**TABLE 1 OUTPUT COMPARISON**

Type of charging	Before charging	After charging
Solar panel	6v	10v
IR grid	6v	14v

#### TRAIL 1:

1. For the trail (1) after two hours of charging, a 12v battery is drained to 8v and connected to the solar panel. The voltage is increased to 2 volts after two hours, and the battery's charge is checked using an analogue multi-meter.

#### TRAIL 2:

2. For the trail (2) after two hours of charging, a 12v battery is depleted to 8v and connected to the solar panel. The voltage is increased to 6 volts after two hours, and the battery's charge is checked using an analogue multi-meter.

#### ADVANTAGES:

- Energy production for 24 hours.
- There is no need for manual help.
- The principle is simple.
- Compact.
- Simple to maintain.
- Highly effective.

#### DISADVANTAGES:

- High initial cost.
- High –scale design is required for mass energy generation.

**APPLICATIONS:**

- It is used in remote places where no power lines could laid
- It is used in army and military bases in remote areas
- This can be used as a power backup for ceaseless systems in various research and operations

**VI. CONCLUSION AND FUTURE WORK:**

It is often assumed and specifically concluded that solar panels can successfully preserve energy both during the day and at night, contrary to popular opinion. Because of the IR grid size, IR sensor with a high intensity, and the use of various types of sensors such as moon light sensors, pyro definitely electric sensors, it can be inferred and essentially concluded that solar panels can conserve power effectively during both day and night time in a subtle way. This paper also focuses on alternatives to the infrared sensor, which is now being researched for further development in a major way.

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