Survey on Automatic Solar Tracking System

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Abstract--*Solar energy is very important renewable energy resources. Solar energy is a nonconventional source, used to fulfil the electricity needs. This paper explains about the Automatic microcontroller based Solar tracking system which is more efficient than the existing Grid Solar System. This System architecture consist of Solar panel, LDR sensors, Controller, Battery, Motor and GSM module. Solar tracker is a device use to track the maximum light intensity. LDR sensors will actively monitors the sunlight and controller will rotate the Solar panel based on sensors value. User will get a message from a System when the battery is full.*

Keywords— **Arduino, LDR sensor, GSM module.**

I.INTRODUCTION

Solar cells arecheap source and efficient for electricity generation compare to hydraulic generators. Output of the Solar panel is always depending on maximum intensity of sunlight. Existing Grid system are fixed, not able to track the light intensity. This problem can be solved using an Automatic Solar Tracker. It consists of LDR sensors and Arduino, which constantly monitor the sunlight and rotate the panel to the proper direction based on maximum intensity. This will increase the efficiency and usage of energy. Light Dependency Register(LDR) mainly used for measuring the maximum sun light intensity. GSM module is controlled by the Arduino to send a message to the user. Automatic solar tracking system helps us to gain the maximum amount of solar energy.

Sunlight based boards gather sun-based radiation from the sun Furthermore actively change over that vitality on power. Sunlight based boards need aid comprised about a few unique sun-oriented units. This sun-based unit's capacity comparatively will expansive semiconductors What's more use an expansive zone p-n intersection diode. When the sun-oriented phones are uncovered on sunlight, the p-n intersection diodes change over those vitality starting with daylight under usable electrical vitality. Those vitality produced from photons striking those surface of the sun-based board permits electrons to a chance to be knocked out of their orbits and released, also electric fields in the sun-oriented units draw these allowed electrons on a directional current, starting with which metal contacts in the sun powered cell camwood produce power. Those a greater amount sun-oriented unit clinched alongside a sun-oriented board and the higher the personal satisfaction of the sun-based cells, those more downright electrical yield those sun-oriented board might prepare. Those transformations about daylight will usable electrical vitality need been dubbed those photovoltaic impacts.

II- LITERATURE SURVEY

This paper [1] describes the complete design and construction of a microcontroller based automatic solar panel tracking system. The solar panel is fixed and no automatic tracking of sun light based on its intensity.The System architecture made up of a LDR sensor senses max solar power which is being given to the Arduino which digitizes the LDR output. Its active sensors constantly monitor the sunlight and rotate the panel towards the direction where the intensity of sunlight is maximum.Due to rotation of earth, panels can't maintain their position always in front of sun. An automated system is required which should be capable to constantly rotate solar panel. A unique feature of this system is that instead of taking the earth as its reference, it takes sun as a guidance.

This paper [2] explain about the effects of global warming and how can we take advantage from this effect like how the Solar energy is used for electrical energy generation. Solar tracking System is based on AVR microcontroller, which is a

brain of a complete system. This controller will monitor and control the intensity and rotation respectively. This system is more cost effective and efficient. System installation is easy. But the trackers are complex than the fixed solar systems.

This paper [3] includes a solar array, solar frame and two actuators, and also it is a dual-axis solar tracker capable in extreme weather conditions.it has mechanically linked solar trackers in a large configuration of solar array, so that they can operate in unison way. This solar observe the radiation and send to the photovoltaic cell to convert the power from AC to DC. And it as a moveable technology of solar panels to expose with sun throughout the day.

This paper [4] describe that the targets to reduce carbon emission and to secure energy supply. It measures a change in the energy supply system leading to smart grids for the required innovation. the key feature in the smart grid application is the demand side service offered to designated parties by smart-automation system. and also the fundamentals on research of smart home energy management system and shows the idea of its utilization for demand side management and simulation experiment of low voltage grid with distributed sources.

This paper [5] proposes concept based new topology, it consist of seven level inverters with less number of power electronics switches with utility grid connection. Here the cost complexity, switching losses is small, because of less usage of switches. The dc converters receive input from the three positive output voltages generator. For further enhancement in the output waveform, the filter circuit can be integrated in the output terminal of the multilevel inverter. This paper also proposed a concept of neuro-fuzzy controller for controlling the seven level inverters.

III. EXISTING SYSTEM

On-grid roof frameworks. This framework comprising for grid associated roof framework which may be associated with those grids also bolster the surplus power to grid. This framework may be not associated with those battery bank, In this way low support cosset. Be that it will be not suitable region for poor grid connectivity alternately unpredictable force supply. Mixture roof frameworks. This framework combines the profits of both on-grid framework and off-grid framework. Framework will be associated with the grid Furthermore battery bank. It is practically utilization full for houses, nursing homes furthermore different littler establishments. It considers the framework to provide 6-7 hours for reinforcement for and only those load throughout energy cuts.

IV. PROPOSED SYSTEM

This framework empowers advanced mobile tracking, battery observing What's more helps the client. Those frameworks will track those greatest light force and repositions those sun-oriented board towards sun, screens those battery level Furthermore send that finish information of the cloud. Those clients could register of the app Furthermore could include those home appliances rundown of the app. The finish data regarding those battery statuses will be Gave to client through the app by gaining entrance to the cloud information.

V. SYSTEM PURPOSE

Commercial purpose of solar tracking system:

- ✓ Higher efficiency of the panel.
- ✓ Maximum power per unit area.
- ✓ Increase in Solar Panel Output.

The sun's position in the sky varies in the seasons and time of day as the sun moves across the sky. Hence there are two types of solar tracker:
- ✓
- ✓ Single Axis Solar Tracker.
- ✓ Dual Axis Solar Tracker.

Single AxisSolar Tracker: single Axis sun-based trackers might possibly need a level alternately ahub. Those level kinds may be utilized within tropical areas the place the sun gets high during noon, yet the times would short. Those kinds may be utilized within shelterlatitudes (for example, clinched alongside UK) the place the sun doesn't get precise high, at middle of the year days could make altogether in length.

Dual Axis Solar Tracker: Dual Axis sun-based trackers need both a level, a hub also others could track the sun's clear movement precisely anyplace in the planet. This sort of framework may be used to control galactic telescopes, thus there is a lot of product accessible to naturally foresee Furthermore track the movement of the sun crosswise over the sky. Double hub trackers track the sun both east with west Also north should soutane to included control yield (approximate 40% pick up) What's more comfort.

Solar tracker drives, can be divided into three main types depending on the type of drive and sensor:

- ✓ Passive attackers.
- ✓ Active attackers.

Active Attackers: Active solar power setups rely on external energy sources – or backup systems, such as radiators and heat pumps – to capture, store and then convert solar energy into electricity. Depending on the complexity of the design, it can heat or cool your home or provide power to an entire neighborhood. Active solar systems include the following features:

- The collectors are made up of flat – plate PV panels, which are usually mounted and stationary. In advanced designs, panel are often connected with each other to form modules.

- The solar collectors use liquid or air s conductors to store and convert energy. Those that use liquid are known as hydronic collectors, while those that contain air are called air collectors.
- Liquid conductors are more common than those that are air-based, as liquid is generally more efficient at conducting heat, though air-based solar systems have the benefit of not freezing.

Passive Attackers: In contrast to active solar system, passive system operate without the reliance on external devices. Rather, such as in greenhouses, solariums and sunrooms, solar energy captures sunbeams through glass window that absorb and retain heat. Passive system includes the following features:

- Instead of using PV panels, passive collectors usually rely on south-facing windows to convert rays into sunlight.
- Design of passive solar collectors is based on the law of thermodynamics, which posits that heat transfer from warm to cool surface, such as through convection.
- The success of the passive system depends on its orientation and the thermal mass of its walls, which determine its ability to absorb heat.s

VI. APPLICATION

By using thissystem,it takes less time to construct and provide more efficiency. installation of this system is easy and cost effective this system tends to save more power and reduces human errors.

VII. CONCLUSION

Concept of solar tracking system detects the position of the sun and makes the panel to contact with the sunlight perpendicularly. It makes solar panel to give more yield compared to ordinary solar panels and it presented a maximum power point controller for a soft switching multi-input converter in solar energy system. The controller as shown to be able to track the maximum power point accuracy. The goal of the project is to design and implement a automatic tracking of sunlight intensity to solar panels. The knowledge and information can also become the starting point for future development of a various application.

VIII. ACKNOWLEDGEMENT

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