

The Automatic Solar Tracker Chronicles

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Abstract: *The Solar imperativeness is expanding more focus on basic terms of developing the work of an economic power source. The Solar cells which change over the sun based essentialness into electrical are inefficient and much excessive. It is the most legitimate development to develop the viability of daylight based cells. In the present time, generally, countries revolve around the feasible power wellspring of advantages. Sun is the genuine wellspring of the manageable power wellspring of benefits. This paper is based on the examination of modified sun arranged tracker accomplishes greater imperativeness from the sun and widens the viability or gives more precision. Right when the sunlight's power decreases, the system modifies its course thus to get the most outrageous light power. This paper finds out about the presentation of sun based board for which the most outrageous imperativeness is created.*

Keywords: *Solar energy, solar panels, solar cells, renewable resource*

I. INTRODUCTION

This tracker contains a modified sun based board which tracks and seeks after the Sun's shafts to extend its ability. The circumstance of the sun in sky changes when both with gear in a safe position. A heliostat is a champion among the best sorts of sun based tracker when a mirror that mirrors the moving sun to the fixed zone, too various approaches have been used. The Active tracker uses gear plans and motors that immediate the tracker advised by the controller which responds to the modernized daylight based bearing. This tracker is used for a few executions, for instance, sun-controlled lighting structure, sun-situated warm groups, and daylight-based cells. The modified sun situated tracker is useful for the device which needs bounty sunshine for progressively imperative capability as daylight based cell. A bit of the sun put together sheets had been put with respect to a fixed surface like a housetop. Exactly when the sun is a moving article, it isn't the best strategy to apply. Wind, water, and sun are the ordinary supportable power source resources. Sun's essentialness is the most conceivable wellspring of feasible resources. The Solar power is the best and capable wellsprings of imperativeness, where they give much power when it is pointed towards the sun in any contrary ways, so a champion among the most everlasting wellsprings of essentialness is sun which gives about 1.8×10^{11} MW of ability to the earth.

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The Solar system may contain photovoltaic cells that go about as a p-n crossing point. Photovoltaic converts the light bars happening to from sun and changes into the electrical stream again with photovoltaic effect. The photovoltaic's viability is low, where the essential driver for both is the sharp and cash related conditions of the photovoltaic system. In various daylight based loads up, sun based gatherer's had been put, which includes the best radiation from the sun and its ability of the sun based expert that can be increased by the sun situated tracker with respect to its zone and time. The Solar tracker works when we, in general, consider the watchful position of the sun with respect to earth. The board ingests most outrageous radiation when the sun moves. So the sun situated board improvement is basic.

DESCRIPTION:

The system tracks for intensity of light at maximum. When the intensity decreases, the system changes its direction automatically. Automatic solar tracker (AST) can be divided into four parts:

- a) Mechanical parts
- b) Electrical parts
- c) Electronics parts
- d) Programming to control the system

II. PRINCIPLE OF TRACKER:

It is one of the developments of the sun for the duration of the day and which gives undisturbed reflection to the board. The sun beams which falls on the board in two different ways, one is they will fall straightforwardly in the sun oriented board and another one is the reflector will reflect episode beams in the sun based board. At the time the sunrise is in the east and the reflector adjusts in some position and the episode beams fall on the board. At the point when the earth begins turning and the situation of sun changes, change in reflection likewise happens. Correspondingly, when reflection falls on the sensor appended at best of the board, the circuit makes the tracker move downwards in course. We united two straightforward standards. One is the standard of occurrence and the appearance in which the following framework works. The other one is the guideline in which the board takes a shot at the episode sunlight based beams. At the point when the photovoltaic cells produce power, both the standards



join and result in which it can get the yield.

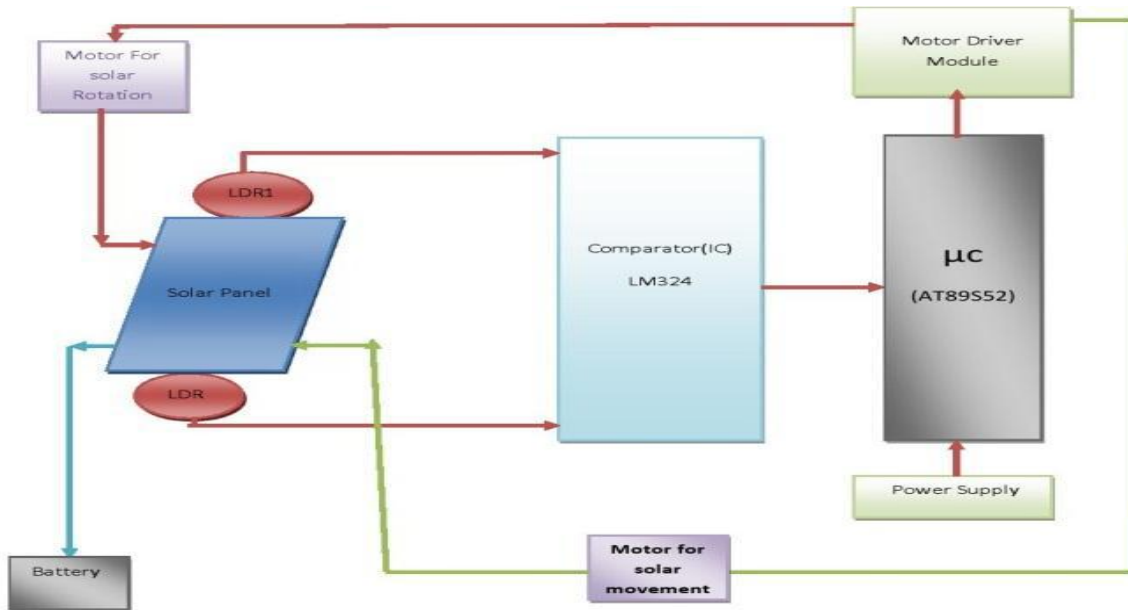


Fig.2 Block Diagram

2.1 NEED OF AN AST:

Photovoltaic's field innovation and its exploration identified with a utilization of the sunlight based cells alluded as sun-powered vitality. These phones having more applications, similar to Individual cells which are utilized for the driving of little gadgets like electronic number crunchers. These Photovoltaic exhibits that create some inexhaustible power, especially it is helpful in the circumstances in which electrical power from a network is inaccessible in earth-circling satellites, control frameworks, space tests, and the water siphon applications. The Renewable vitality which is picking up the significance of vitality assets like petroleum product costs changes. The Solar vitality is the most well known sustainable power sources on the planet. Numerous explores were allocated to build up some new techniques expanding the productivity of boards. Sunlight based tracker empowers parcel of vitality to produce in light of the fact that the board ready to keep up the profile to the beams of the sun. Sun oriented tracker empowers parcel of vitality to create on the grounds that the board ready to keep up the profile to the beams of the sun. The Development of a programmed sun based tracker had been experiencing for quite a long while. The Development of programmed sun-powered tracker had been experiencing for quite a long while. At the point when the sun moves in the sky, sun-oriented board tracks the area of the sun as the boards are opposite to sun-powered vitality radiation by the sun. This thing will, in general, augment the total intensity consumed by PV frameworks. This is evaluated that the utilization of a tracker in a fixed framework can build the

intensity of yield by 30% to 60%. The noteworthy increment is sufficient to make the tracker a feasible relational word in spite of the framework cost.

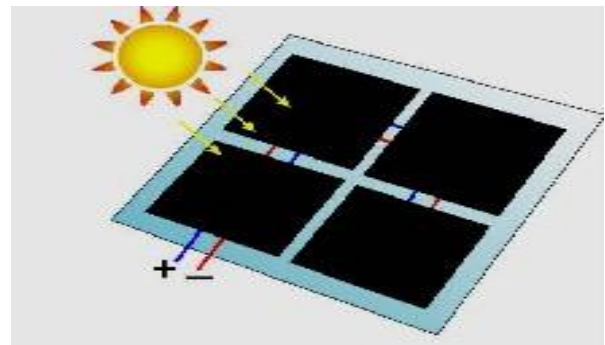


Fig.2.1 Solar Panels

III. ADVANTAGES:

- The Solar tracker is used to orient the solar panels towards sun and the investment in your solar tracker system is maximized. The position of the sun will gradually change in a day and throughout the year it may change over seasons.
- It is utilized as best in territories with fewer skylines and the without shade area from morning till night consistently. During the time the tracker exhibit can use the open wellspring of access to pick up electrons from the sun's radiation. Vitality generation is an ideal state and step by step the vitality yield is expanded.



- The Photovoltaic pack framework is a solid and uncomplicated vitality wellspring of creation. A sunlight based tracker is utilized to arrange the sun oriented boards ceaselessly towards the sun.
- The position of the sun will change as they are beneficial. The Advantages to use tracker systems as it mainly depends on the placement of determining the effective solar panel.

IV. DISADVANTAGES:

- Costs high in the midst of the headway, it is difficult to control the speed of the motor and moreover difficult to design. Including of daylight based tracker system to your sun situated sheets, it joins moving parts and mechanical assemblies that will require standard help of sun based tracker and substitution and fix of broken parts.
- In case it is an electronic control tracker and it stops working, by and by you don't have physically worked control; there is one decision which can be picked at the purchase time.
- The displays can be physically arranged to daylight based south and assurance that it will continue getting logically sun based essentialness as could sensibly be normal. All Solar after the system must have a couple of bothers comes through.

V. LITERATURE REVIEW:

5.1 Review on (two tomahawks sun situated tracker):

The US Patent no.0215199 A1 [2007] by Robert H. Dold depicts a two-turn daylight based tracker prepared for withstanding the unprecedented atmosphere conditions. The sun based tracker consolidates a sun-arranged group, a packaging, a base, a turn diagram, and a first and second actuator. The sun arranged group is mounted to the packaging and gets light. The base is urgently connected with the packaging and portrays a turn rotate for elevational improvement of the daylight based bunch. The turn plot is furthermore direly connected with the edge and describes a turning turn for the azimuthal advancement of the sun based bunch. The base is desperately connected with the packaging and portrays a turn center point for elevational improvement of the sun arranged group. The pivot diagram is similarly essentially connected with the packaging and

portrays a turn center point for the azimuthal advancement of the sun arranged group. The primary actuator controls the elevational advancement of the sun based display and the second actuator controls the azimuthal improvement of the sun arranged group. The sun arranged tracker is pivotable between a raised position and a stowed position.

5.2 Review on (various Sun-controlled trackers):

The US patent No. 0308091 [2008] by Ronald P Corio ensures as an object of the his improvement to absolutely interface diverse daylight based trackers in a significant bunch course of action so they may function as one, driven by a lone motor and tracker controller, whereby the mechanical linkage system is organized to such a degree, that it should simply be fit for withstanding the by and large low powers required to effect advancement of the trackers without the need to contradict greater breeze powers following up on the assortment of trackers. Another object of his improvement is to apply the drive measures to various daylight based single-center point following geometries to expand the monetary execution for each sun arranged after application. Diverse gearboxes can be absolutely associated with drive shafts and driven by a single motor. The drive shafts may combine general joints for the uneven scene or dazzling structures. Symphonious dampers can be joined to the Sun-controlled sheets to decouple wind powers which license the use of greater daylight based sheets.

5.3 Review on (customary sun based tracker):

A US patent No. 0293861 by William F Taylor [2009] portrays a normal sun arranged tracker using controllable moveable daylight based sheets to open them always to the method for the sun both for the span of the day and reliably. For example, reference may be made to U.S. Patent No.6058930. The system may contain a sun-based board group gathering having something like two associations, an assistance hook motivates together to join to a surface and having something like two associations, and an assistance structure including a greater part of extended help shafts for checking the show get together over the assistance stay get together. Each assistance bar may be joined toward one side to one of the associations of the daylight based board display and added at the contrary end to one of the associations of the assistance stay get together.5.4 Review on (solar collector):

VI. FUTURE SCOPE:

This project is focused to develop and build an Automatic Solar Tracker (AST) by using advanced plc technology to move the DC motor which will direct the panel from



east to west and brings back to its initial.

This project scope is as follows:

- An automatic solar tracker which detects the sun quickly during daylight and also in extreme weather conditions.
- It uses advanced PLC to move the motor clockwise or counter clockwise in direction.

- (4) US Patent no.0215199 A1 [2007] by Robert H. Dold describes a two axis solar tracker.
- (5) US patent No. 0308091 [2008] by Ronald P Corio claims as an object of his invention to mechanically link multiple solar trackers.
- (6) Qiang Xiei's US Patent No.0051017 A1 [2010] refers to a solar collector.
- (7) A US patent No. 0293861 by William F Taylor [2009] describes a conventional solar tracker.

VII. . CONCLUSION:

The arranged that structure which ensures 25 to 30% or more imperativeness change than the present static sun based module system. Yet Automatic Solar Tracker (AST) is a model towards a real system, still its item and gear can be used to drive a real and colossal sun situated board.

The arranged system is revolved around organizing controller part and the essential concern is to design fitting circuits and the circuits accept to in all probability control DC-gear motor rotate course without contemplating motor speed. Disregarding the way that AST is a model towards a real structure, its gear and writing computer programs are used to drive massive and veritable daylight based board. Its control circuitry can be driven by small portable battery. The Control system and the algorithm is been used in moving Dish Antennas and RADAR by replacing its sensing instrument.

REFERENCE

- (1) Neenu Sharma, Brijbhushan Sharma M. Tech Scholar, Dept of Electronics and Communication Engineering, Shoolini University of Biotechnology and Management Sciences, Solan, H.P., India Assistant Professor, Dept of Electronics and Communication Engineering, Shoolini University of Biotechnology and Management Sciences, Solan, H.P., India.
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