

## Solar Power Generation with Maximum Power Point Tracking

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### ABSTRACT

Solar energy is produced by the solar light is a non-vanishing renewable source of energy.

As we all needs electricity in our whole daily life. And the non-renewable sources are limited in nature.

So here we are tried to extract more efficient solar energy to generates the electricity.

In this project we used the rotating solar plates in the direction of sun travels. To get more efficient light .we use LDR sensor to control the motor rotation .where the sensors work according to the intensity of sun rays.

### I. INTRODUCTION

Due to increasing demand for electricity, and limited stock of high-traditional sources of prices (such as coal, oil, etc.), and photovoltaic energy becomes promising as is the case everywhere, which is freely available, environmentally friendly, and has a lower operation and maintenance costs substitute. Therefore, it seems that the demand for PV generation systems to increase for grid-connected PV systems. So, here we are used the maximum power point tracking of solar light with the help of rotating photovoltaic solar plates. For sensing the sun light we mount the photo sensor on the top of the solar seeker. Photo sensor sense the light and provide to the motor control circuit. If the light is sufficient then Photodetector provide a signal to the microcontroller and microcontroller stop the motor at this position.

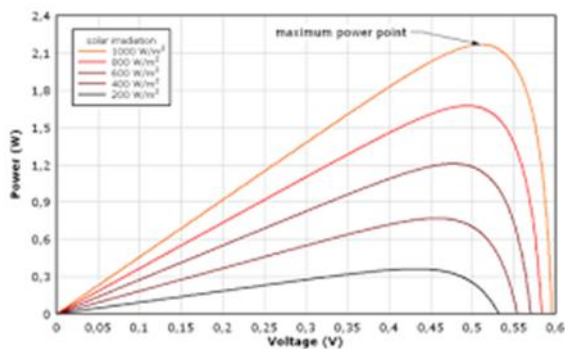
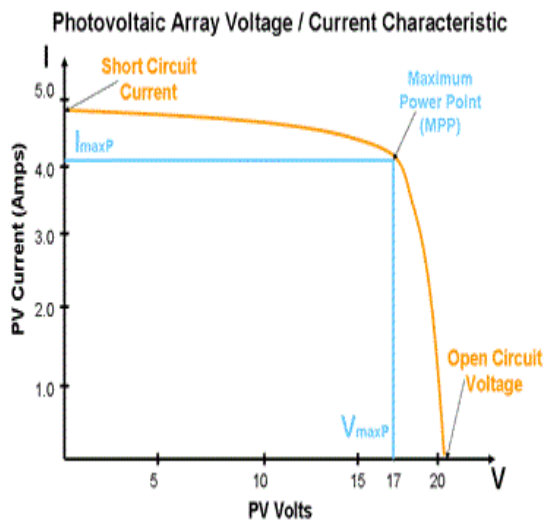
In this project we use two LDR as a photo sensor. One LDR monitor the light and provide to the controller for stop the motor and second LDR sense a day or night logic. If the dark ness is there then controller stop the seeker for searching a light. Now seeker search a light in the day light only.

While efficiencies have been improved, the cost of the solar cells themselves has steadily

fallen with increasing mass production in recent years and should continue to do so over the coming decade. Development of systems technology and integration of solar cells into building materials such as roof tiles is also reducing the overall system costs and making them more attractive to buyers.

### II. REVIEW OF LITERATURE

Various models have been used for depicting the PV module and two-diode model is found to be very accurate but it requires computation of seven parameters. Conventional MPPT Techniques The following are some of the MPPT techniques which are suitable for uniform irradiance conditions. They are Perturb and Observe, Hill Climbing algorithm, Incremental Conductance, short circuit current, open circuit voltage and ripple correlation control approaches. Even though these techniques are simple and easy to implement, they cannot be used under partial shading conditions. Intelligent MPPT Techniques 4 FLC based MPPT Fuzzy logic based MPPT does not require the knowledge of the PV panel. It has two inputs and one output. Mamdani's method is used for fuzzy inference and centre of gravity method for defuzzification and the duty ratio is computed. Table 1 Fuzzy Logic Based Rules E & ΔE Small Medium Large Small ZO NS NB Medium PS ZO NS Large PB PS ZO. Artificial Neural Network based MPPT The three layer RBFN NN is adopted for implementing the MPPT. The number of input units in the input layer is three while the hidden layer has nine input units and the output layer has one unit. To control the duty cycle of the switch, PWM pulses are generated using PV module. Enhancement of weight of links and adjustment of parameters used for learning will enhance the performance of the system. ANN based methods is suitable for the systems that can get sufficient training data.



### III. OUTCOMES

When light reaches the p-n junction, the light photons can easily enter in the junction, through very thin p-type layer. The light energy, in the form of photons, supplies sufficient energy to the junction to create a number of electron-hole pairs. The incident light breaks the thermal equilibrium condition of the junction. The free electrons in the depletion region can quickly come to the n-type side of the junction. The holes in the depletion can quickly come to the p-type side of the junction. Once, the newly created free electrons come to the n-type side, cannot further cross the junction because of barrier potential of the junction.

Similarly, the newly created holes once come to the p-type side cannot further cross the junction because of same barrier potential of the junction. As the concentration of electrons becomes higher in one side, i.e. n-type side of the junction and concentration of holes becomes more in another side, i.e. the p-type side of the junction, the p-n junction will behave like a small battery cell. A voltage is set up which is known as photo voltage.

If we connect a small load across the junction, there will be a tiny current flowing through it.

### IV. CONCLUSION

The intensive and massive use of energy from the solar cell is more efficient as the sun is free, it doesn't cause pollution, reliable and silent and is essential for providing solutions to environmental problems. Implementing the MPPT algorithm through digital controllers is easier if it is possible to minimize error functions. The differences between the various MPPT techniques are very slight and they can be evaluated according to the situation. For a particular application, selecting a particular MPPT is a tough task and this paper will be a good reference for the researchers who work with MPPT. Also, since the technology is advancing, the cost of solar plates, as well as the installation cost, will decrease down so that everybody can effort to install the system. Furthermore, the government is laying much emphasis on the solar energy so after some years we may expect that every household and also every electrical system is powered by solar or the renewable energy source.

### REFERENCES

- [1]. S. Rehman, A. Bader Maher, A. Al-Moallem Said, "Cost of solar energy generated using PV panels", *Renewable and Sustainable Energy Reviews*, vol. 11, pp. 1843-57, 2007.
- [2]. BidyadharSubudhi and RaseswariPradhan, "A Comparative Study on Maximum Power Point Tracking Techniques for Photovoltaic Power Systems" *IEEE Transactions on Sustainable Energy*, 2013, Vol. 4, No. 1
- [3]. M. A. S. Masoum, H. Dehbonei, and E. F. Fuchs, "Theoretical and experimental analyses of photovoltaic systems with voltage and current based maximum power point tracking," *IEEE Trans. Energy Conv.*, 2002, Vol. 17, No. 4, pp. 514-522
- [4]. www.



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