



A Review of the Experimental Study and Performance Analysis of Power Quality Measurement of PV Cells with MPPT

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ABSTRACT

The battery charge level (SOC) reaches a certain level; the current pulse charge system sets the rest time to reach the average charge current with illumination mode. During charging, the MPPT function is maintained so that the charging function can be efficiently mounted. Using a pulse charging program can prevent the battery from charging. One difference in these configurations is that microtransformers are deployed instead of just one inverter per solar panel. There are now new MPPT-equipped, specialized inverters that perform three functions: grid-connected wind energy with solar photovoltaic energy and split energy for charging batteries.

Key Word- Photovoltaic cells; Charge controller; MPPT:

1 Introduction

This article about the use of MPPT is only about solar PV. There is a complex relationship between temperature and the total resistance of solar cells. This results in a non-linear production efficiency. MPPT devices are usually connected to an electrical power conversion system that provides voltage or current conversion, filtering and control using various load motors, including cables, batteries or actuators.

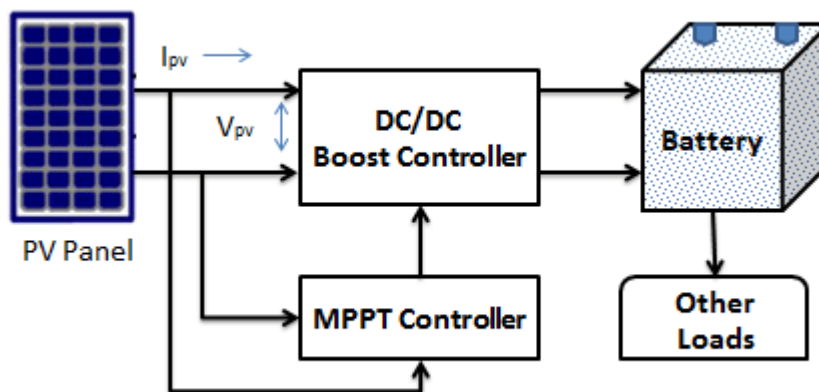


Figure 1 PV Cells and MPPT devices based systems

2 MPPT placements

Conventional MPPT solar inverters are used for all solar panels. (Unit link) is generally in such a system. The same current is applied by the inverter. It flows through all modules in series (serial) because different modules have different IV and MPP curves. (Due to the stability of the output, this structure means that some modules will operate under MPP, resulting in power loss.

3 Basic Operating Principle of a Photovoltaic Cell

The working principle of solar cells is similar to that of transmission in semiconductors such as silicon. As can be seen from the picture, black surfaces are those that are exposed to sunlight when electromagnetic rays hit the surface of the cell. They excite electrons and cause electrons to move from one energy level to another. Leaving a hole in the back, these holes serve as a carrier of positive charges. Although electrons act as negative charge carriers, don't get confused, electrons or holes don't generate electrical charge. They only carry luggage. To do this, electromagnetic radiation is converted into electrical energy. Solar cells usually consist of semiconductors such as silicon and selenium. It is the most used.

4 Construction of Simple Photovoltaic Cell

Knowing that semiconductor materials like silicon and selenium can be expensive. We will talk about how to make solar cells using materials like silicon, and how to make solar cells using cheap materials available around us.

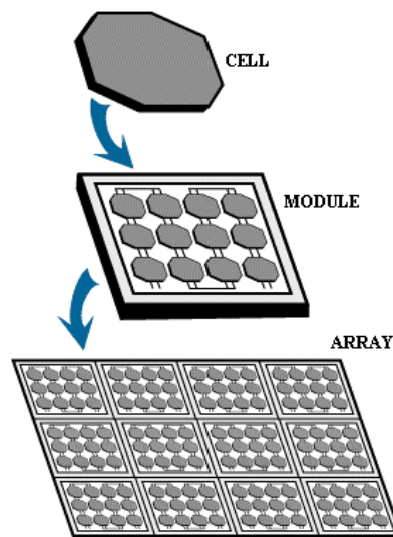


Figure 2 Cells, Module and Array

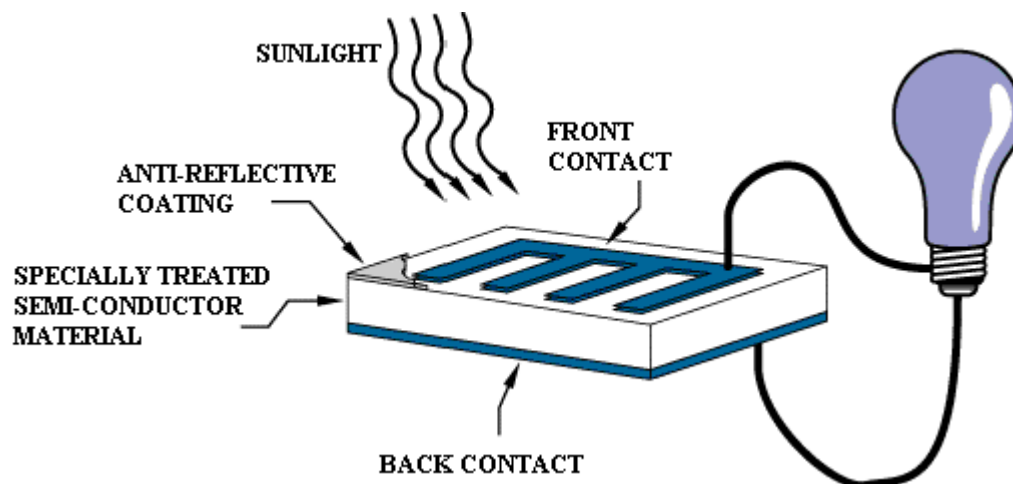


Figure 3 Photovoltaic Cell with contacts

5 Literature review

Huang-Jen Chiu (2011) - High voltage monitoring voltage (MPPT) used in photovoltaic system, photovoltaic array power, temperature, and rise in temperature range. New MPPT system configuration, which includes a DC to DC converter, is controlled by an element based on the microcontroller. There are two parts to the cost of that PV charger set. At the beginning of the prosecution process, the scheme of continuous closure of the MPPT was

adopted. J Surya Kumari (2011)- PV systems typically use high performance power technology (MPPT) to achieve the highest possible energy level by taking advantage of thermal and humidity changes. . And photovoltaic (PV) power generation has become increasingly important as a renewable energy source. It offers many advantages like gasoline price, performance, low maintenance and low noise.

Siwakoti, Yam Prasad.(2010) - These modules provide a measurement of the solar space based on a comparison of the study area, the stability of the solar power supply, and the electrical energy generated by that photovoltaic. Jawad Ahmad (2010)- Power point tracker battery charger photovoltaic pan charger to increase power output is recommended. The power of a photovoltaic system varies with changes in temperature and humidity. It is important that you improve the performance of the charger. The high-power output (MPPT) method is available for accelerating PV systems at high power. Mohammad H. Rashid (2009)- India needs to generate more electricity, while maintaining the current economic growth of 8-9%. Today, renewable energy (RE) and technologies are on the rise in the world. There are various sources of renewable energy.

6 Conclusions

Charger performance varies greatly depending on weather, temperature, battery condition, etc. Microcontroller-based systems actually provide control tools when the system heats up. Once the MPPT algorithm is installed on the system, the party is quickly restored. MPPT-based control systems are important to the solar system because they monitor power levels when power changes in the installation method due to different stage. Therefore, it is recommended to use MPPT-based system.

References

- [1] M. E. Ropp, "Comparative study of maximum power point tracking algorithms," *Prog. Photovolt: Res. Appl.*, vol. II, pp. 47- 62,2003
- [2] Godfray Chinyamma, "Development of microprocessor based charge controller for home photo voltaic system," *ATDF journal*, Vol. 2 issue 2, pp 19-22.
- [3] Shih-Jen Cheng, "Design and Implementation of a Photovoltaic High-Intensity-Discharge Street Lighting System", *IEEE Transactions on Power Electronics*, Vol. 26, No. 12, December 2011
- [4] Jawad Ahmad, "A Fractional Open Circuit Voltage Based Maximum Power Point Tracker for Photovoltaic Arrays", *Proceedings of 2nd IEEE International Conference on Software Technology and Engineering, ICSTE 2010*, pp. 287-250.
- [5] Ch Sai Babu et.al, " Design and Investigation of Short Circuit Current Based Maximum Power Point Tracking for Photovoltaic System" *International Journal of Research and Reviews in Electrical and Computer Engineering (IJRRECE)* Vol. 1, No. 2, June 2011 ISSN: 2046-5149.