SOLAR ELECTRIC CONTROLLER

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Abstract-

Solar cells convert sun light into electricity, but have the major drawbacks of high initial cost, low photo-conversion efficiency and intermittency. The current-voltage characteristics of the solar cells depend on solar insolation level and temperature, which lead to the variation of the maximum power point (MPP). Herein, to improve photovoltaic (PV) system efficiency, and increase the lifetime of the battery, a microcontroller-based battery charge controller with maximum power point tracker (MPPT) is designed for harvesting the maximum power available from the PV system under given insolation and temperature conditions. Among different MPPT techniques, perturb and observe (P&O) technique gives excellent results and thus is used. This work involves the design of MPPT charge controller using DC/DC buck converter and microcontroller. A prototype MPPT charge controller is tested with a 200 W PV panel and lead acid battery. The results show that the designed MPPT controller improves the efficiency of the PV panel when compared to conventional charge controllers.

INTRODUCTION

Solar power is a form of energy harnessed from the power and heat ofthe sun's rays. It is renewable, and therefore a "green" source of energy.The most common form of solar energy is harnessed by solar panels, orphotovoltaic cells. In photovoltaic power stations, they're arrangedalmost edge-to-edge to capture sunlight in large fields. You'll also seethemontopofhousesandotherbuildingsat times,aswell.Thecellsarecreated from semiconductor materials. When the sun's rays hit the cells,it loosens electrons from their atoms. This allows the electrons to flowthroughthe cellandgenerateelectricity.

PROBLEMDEFINATION

Internet business short for electronic trade is exchanging itemsor administrations utilizing PC organizations, for example, theWeb.Theproposedepromotingmodelhereisaninternetbusiness entry for online medication exchanging and lookinggiving clients the rundown of neighboring clinical shops.

ADVANTAGESOFSYSTEM

- Reducedelectricbill.
- Insuranceagainstrisingenergycosts.
- Cheaperpowersource.
- Returnoninvestment.
- Environmentallyfriendly.

LITERATURESURVEY:

The MPPT system can be classified based on the algorithms used; power converter in the system and application of the system (Standalone or grid interconnection)

A solar charge controller is fundamentally a voltage or current controller to charge the battery and keep electric cells from overcharging. It directs the voltage and current hailing from the solar panels setting off to the electric cell. Generally, 12V boards/panels put out in the ballpark of 16 to 20V, so if there is no regulation the electric cells will damage from overcharging. Generally, electric storage devices require around 14 to 14.5V to get completely charged. The solar charge controllers are available in all features, costs, and sizes. The range of charge controllers is from 4.5A and up to 60 to 80A.

The most essential charge controller basically controls the device voltage and opens the circuit, halting the charging, when the battery voltage ascents to a certain level. More charge controllers utilized a mechanical relay to open or shut the circuit, halting or beginning power heading off to the electric storage devices.

Generally, solar power systems utilize 12V of batteries. Solar panels can convey much more voltage than is obliged to charge the battery. The charge voltage could be kept at the best level while the time needed to completely charge the electric storage devices is lessened. This permits the solar systems to work optimally constantly. By running higher voltage in the wires from the solar panels to the charge controller, power dissipation in the wires is diminished fundamentally.

The solar charge controllers can also control the reverse power flow. The charge controllers can distinguish when no power is originating from the solar panels and open the circuit separating the solar panels from the battery devices and halting the reverse current flow.

.SYSTEMARCHITECTURE

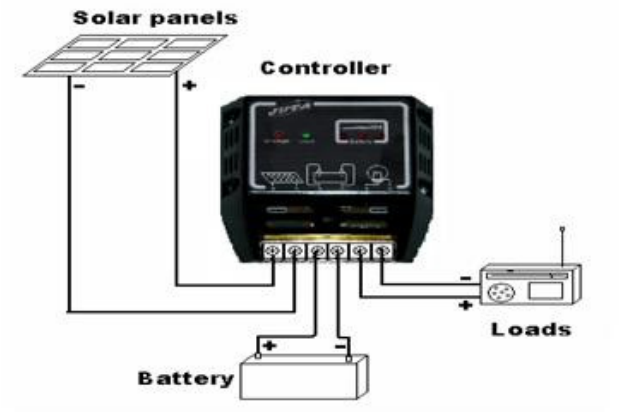

Fig-1:SystemArchitectureDiagram

SYSTEMREQUIREMENTS

- **SoftwareUsed:**

1. Operating System: Windows XP and laterversionsFrontEnd:HTML,CSS
2. ProgrammingLanguage:PHP
3. Tool:XAMP&NOTEPAD++
4. Domain:WEBAPPLICATION
5. Algorithm:Hashing.

- Hardware Used:

1. Processor–i3orabove
2. HardDisk –150GB
3. Memory–4GB RAM

ALGORITHMS

• Compared to the real application, the fitness function might be complex with long calculation time.
• The more parameters, or chromosomes that the individuals have, the longer and more memory intensive will be required by each iteration.
• The result is not guaranteed to be the best solution. The algorithm has a tendency to converge towards local optima. • It is difficult to operating on dynamic data which means it is not suitable to use in real time auto tuning.
• The fitness measurement error would affect the optimization.

CONCLUSION

Solar energy reduces greenhouse gas emissions in the atmospherebecause it harnesses the power of sun energy with little to no gases beingreleased. The amount of carbon dioxide released to the atmosphere isway less from solar energy compared to coal plants when seeking toproducethe same amountofKWhperyear.

Acknowledgment

We would like to express our deepest gratitude to our guideProf.R.E. POTDAR forprovidingtodotheprojectunderherguidance.Hersuggestion sandsupportprovedvaluableinenabling the successful completion of our project “Electric Solar Controller”. We would also like toextendourgratitudetoourrespectedprincipalsirProf.S.R.Upa sani, as well as respected HOD mam Prof. S.V. KARANDE whose encouragement was main source of our energy behindthis work.

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