Abstract

Wind is the most promising renewable source. However its erratic behavior hampers the output especially when the energy generated is to be stored safely and used as per demands. The paper reveals the charging battery with maximum power point tracking (MPPT) considering battery safety. The main task of wind power charge controller is to control the flow of charge to and from the battery and protect it from over charging and deep discharging. It regulates flow of charge by monitoring the battery voltage and wind variations continuously. The charge controller developed takes care of weak winds while battery charging and improves the efficiency. Upon fully charging the charge controller disconnects the battery from wind panel to avoid excess charging thus the battery life is increased. Further the performance of the wind charge controller is evaluated and the results shows that use of PWM technique with MPPT increases the efficiency of charge controller up to 92% under different laboratory conditions as compared to normal charge controllers without MPPT having efficiencies up to 52 to 60%.
- Guoyi Xu, Student Member, IEEE, Lie Xu, Senior Member, IEEE, D. John Morrow, Member, IEEE, and Dong Chen "Coordinated DC Voltage Control of Wind Turbine With Embedded Energy Storage System" IEEE TRANSACTIONS ON ENERGY CONVERSION, VOL. 27, NO. 4, pp. 0885-8969, DECEMBER 2012.
- Wujong Lee, Byung-Moon Han and Hanju Cha "Battery Ripple Current Reduction in a Three-Phase Interleaved DC-DC Converter for 5kW Battery Charger" 978-1-4577-0541-0/2011 IEEE.
- Sercan Teleke, Student Member, IEEE, Mesut E. Baran, Senior Member, IEEE, Alex Q. Huang, Fellow, IEEE, Subhashish Bhattacharya, Member, IEEE, and Loren Anderson "Control Strategies for Battery Energy Storage for Wind Farm Dispatching" IEEE TRANSACTIONS ON ENERGY CONVERSION, VOL. 24, NO. 3, pp. 0885-8969.
MPPT based Charge Controller for off Grid Small Wind Machine using PWM Technique

SEPTEMBER 2009.


- T. Tafticht, K. Agbossou, Senior Member, IEEE, A. Cheriti, Member IEEE, and M. L. Doumbia, Member IEEE "Output Power Maximization of a Permanent Magnet Synchronous Generator Based Stand-alone Wind Turbine" IEEE ISIE 2006, July 9-12, 2006, Montreal, Quebec, Canada 1-4244-0497-5/06.

- O. BA, D. Depernet and P. Ndiaye1 and A. Berthon "Medium power wind mill control for standalone energy generation".

- Kuo-Yuan Lo, Yaow-Ming Chen, Senior Member, IEEE, and Yung-Ruei Chang, Member, IEEE "MPPT Battery Charger for Stand-Alone Wind Power System" IEEE TRANSACTIONS ON POWER ELECTRONICS, VOL. 26, NO. 6, pp. 0885-8993, JUNE 2011.

- Wei Qiao, Member, IEEE, Xu Yang, Student Member, IEEE, and Xiang Gong, Student Member, IEEE "Wind Speed and Rotor Position Sensorless Control for Direct-Drive PMG Wind Turbines" IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS, VOL. 48, NO. 1, pp. 0093-9994, JANUARY/FEBRUARY 2012


**Index Terms**

Computer Science

Applied Sciences

**Keywords**

Battery safety charge controller Maximum power tracking Off-grid small Wind mill.