“Smart Solar Monitoring and Charge Control System”
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Abstract— This project mainly contains solar panel, a battery, a solar charge controller, current sensor, display. Using these devices we are able to analyse the efficiency and working of solar panel. Design of this project consist of solar parameter measurement( Voltage ,Current, Power) and charge control system to protect the battery form overcharge Charge controller are designed to improve charge efficiency and safety. The primary function of charge controller is to protect the battery from overcharge and over discharge in photo voltaic system. The main proposals of the project are the implementation of a solar parameter monitoring and charge control mechanism of solar panels.

Key words: Current sensor, display, solar panel, solar charge controller

I. INTRODUCTION
This is a project we are charging a battery form solar energy using solar panel in which we are analysing the parameter of solar panel as well as battery that is current flow when intensity of light is more and how much time the battery takes to get charge. A solar charge controller is also is used in order to control the overcharging of battery. From this we came to known about proper working of solar panel as well as avoid the battery from damage.

Electricity generation of solar panel panels are strongly relat ed with solar radiation intensity. However the intensity is not stable. Therefore, charge efficiency is very important topic in solar system.

Charge controllers are designed to improve charge efficiency and safety. The primary function of charge controller is to protect the battery from overcharge and over discharge.

II. LITERATURE SURVEY
There is lot of studies about the charge controller in the literature. Harrington and Dunlop (1992) analyzed the typical strategies for battery charge regulation in standalone PV systems and conclude that the battery information is very important in designing Photo system. Ullah et al.(1996) focused on the design of super-fast battery charger based on National’s proprietary neural network based nural fuzzy technology. They compared their method with conventional fast charges and indicate that their method reduces the charging time. Meshekeni and Careles (1997) designed an intelligent charge controller, incorporating an SGS-Thompson microcontroller, ST62E20 and discussed the advantage of such charge controllers.

Hsieh el al.(2001) proposed a fuzzy controller active state of charge controller(FC-ASCC) for improving the charging behaviors of a lithium ion battery. In this method, a fuzzy controller algorithm is built with the predicated charger performance to program the charging trajectory faster and to remain the charge operation in a proposed safe charge area. They increased the charging speed about 23%. Yi et al (2007) presented a novel switch – mode charger controller IC for improve the charging efficiency of valve regulated lead acid (VRLA) battery and save its life. They achieved fast transient response and the precisions of both constant current and constant voltage charge modes met the specification well.

III. HARDWARE REQUIREMENTS
1) Solar charge controller
2) Solar panel (12v)
3) IC sockets
4) LED s
5) Ceramic capacitors. And crystal
6) Transistors (Q1 ~ Q7)
7) Electrolytic capacitors.
8) LM7805 regulators.
9) Resistors and diodes
10) PIC series Microcontroller (PIC16F877A)
11) Transformers
12) Buzzer

IV. BLOCK DIAGRAM

Fig.1: Block Diagram of Smart solar monitoring and charge controller system
V. METHODOLOGY

Hardware architecture of the system is composed of PV panel, a resistive load, lead acid battery, GSM module, load switching circuit, Some measurement Circuit (temperature, Current, and voltages etc.), LCD display to observe some data, and buttons to control the system, manually

VI. APPLICATIONS

- Analysis of solar panel.
- To charge the battery.
- In domestic propose

VII. CONCLUSION

In conclusion, we measured the parameter of solar panel as well as parameter of battery with and without using solar charge control. The system monitors parameters successfully and help to analyse the efficiency of solar panel. We have also measured the speed of charging at various instant of time.

REFERENCES


