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## **Abstract**

The charger is the most important part of the solar system because the only limited-age part of this system is the storage batteries. Storage batteries are essential in all standalone solar electric systems (PV power systems). Their efficiency and life time affects significantly the overall PV system performance and economics. The storage battery's effectiveness depends on the charging process. The maximum power point tracking (MPPT) technique is adopted to maximize the PV output power for any temperature and irradiation conditions.

This solar charging system is composed of a solar panel, lead-acid batteries, buck converter as power charger circuit and a PIC81F45K22 microcontroller as a control unit.

The simulation results are achieved by using Simulink Proteus Isis Professional software. These results allowed to demonstrate the validity of the proposed charging technique. The battery charger prototype was tested and the results obtained allowed to conclude about the conditions of permanent control on the battery charger.

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**Index Terms**

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**Keywords**

Lead-Acid Battery, State of Charge, Photovoltaic System, MPPT, Optimal Battery Charger