

An Intelligent low cost IOT-monitoring system for solar energy application

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Abstract—An Intelligent low cost IOT-monitoring system for solar energy application is a more sophisticated monitoring solution that allows users to access logged and real-time data for daily measurements of solar panel parameters and battery system such as voltage, current, power, light intensity, and temperature. These data provide greater insight into energy use and development, which is useful for troubleshooting faults and triggering alarms when a fault occurs. Traditionally, data monitoring requires personnel to manually evaluate the system conditions in order to obtain data during the inspection process. Furthermore, existing systems suffer from a lack of automated data collection and transitioning to an internet-based monitoring system becomes burdensome due to the high cost of system upgrading and maintenance. As a result, it is critical to be able to remotely monitor the solar photovoltaic and battery parameters to reduce the time and costs associated with site visits. This project presents the development of an internet-connected monitoring system for solar panel and battery system using Arduino as the microcontroller and an open source Grafana dashboard programme to pull all collected data into a private webpage and database system for ease of visualization. The proposed project's usefulness is to provide a continuous monitoring system that can be tracked remotely and evaluated on a regular basis to ensure smooth, reliable, enhanced performance, and timely maintenance. The proposed innovation has commercialization potential not only in the energy sector, but also in the manufacturing industry, where remote monitoring of equipment is often regarded as part of the maintenance plan.

Keywords—*solar photovoltaic, internet of things, visualization, energy monitoring*