

IMPLEMENTATION OF WIRELESS DATA MONITORING IN A PV SYSTEM

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ABSTRACT

The use of renewable energy sources is encouraged to meet the rising energy demand. Monitoring of photovoltaic (PV) systems and gathering statistical data are important issues in renewable energy applications. This study presents the implementation of a PV system where the panel output data are gathered and transmitted through the wireless medium using Wi-Fi. This method allows remote monitoring of a PV system. The data about voltage, current, and power production can be collected and reported separately for both DC and AC units. The DC and mono-phase AC measurement values are transmitted via a Wi-Fi access point to the computer where the data are collected.

The system has been designed as a basic prototype PV system model with two 100 W solar panels, an AC inverter, a charge regulator, and two accumulators. A current transformer with 40/5A ratio has also been included in the system. Analog to digital converters have been used for both AC and DC measurements. EV100 series single phase intelligent power meter, and AcuDC 210/220 series DC power and energy meters have been used for AC and DC measurements respectively.

The advantage of the presented model is the ability to monitor PV systems remotely through the Wi-Fi wireless communication medium. This method allows data monitoring with PV systems in environments where the cabling is complicated or impractical. The data gathered via the wireless access point are monitored with a computer, and can be listed with the software interface. This method provides a practical and useful model to acquire data and monitor PV systems.