

Title: SenSIP Research Facility for Solar Panel Fault Detection and Analytics

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The Sensor Signal and Information Processing (SenSIP) center solar monitoring facility was developed in the beginning of 2016 for experimental research on fault detection and power optimization. The facility consists of 104 panels aligned in two arrays of 52 panels each, and is fitted with sensors and actuators. The rating of the research facility is 18kW. This Photovoltaic (PV) array system enables remote monitoring and analytics through a network of smart monitoring devices (SMDs) that have Zigbee communication protocols. These devices are also equipped with relays that allow real-time connection topology changes including modes such as bypass, series and parallel. All data is transmitted to a control center which provides the status of each panel. SMDs also enable operators to program and control the PV array. Research planned at this stage includes developing machine learning methods for fault detection. Research on this PV array is supported in part by the NSF GOALI award 1308052, Poundra LLC, and Energy Wireless.