

Industrial IoT (IIoT) Architecture for Remote Solar Plant Monitoring

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This paper proposes a redundant IIoT network architecture design for SCADA systems in photovoltaic (PV) / solar power plants. IIOT is found at the crossroads of SCADA and IOT, and therefore it encompasses the monitoring and control part of the former, and the data analysis of the latter. Using two industrial carrier boards from Waveshare based on Raspberry Pi Compute module 4 (CM4), a redundant gateway protocol translator is achieved. Data sent from various sensors connected to the peripherals can be encapsulated for transport to the central management system for analysis and decision making. This ensemble is used in solar panel monitoring in our experimental setup alongside various environmental sensors for weather analysis and forecasting. To ensure security over the Internet, a VPN tunnel is established between the egress location and the central system. Being connected via VPN to the central control location ensures a degree of security in communications. Having an always ready data link to the central system guarantees that any modifications an operator makes on the remote solar power plant are to be executed without delay.

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