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Solar Based Smart Irrigation System Using PID Controller

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A smart approach to minimize the human sources in field of agriculture using proportional integral and derivative (PID) Controller by implementing on Microcontroller environment of Arduino. This project includes four sensors; namely as, Moisture-level, Wind speed, Ambient humidity and Radiation sensors while taking moisture of soil as setting point. Moreover, A DC motor is used for water pumping to soil with the help of control algorithm of Pulse Width Modulation (PWM) which provide precise amount of water to soil and ensure the speed of water before the motor needed to be stopped. This Project is Energy self-sustainable by the used of solar panel for battery charging which makes this project green and permits a farmer to grow crops in distant area with no time and again to check the appropriate conditions of the field. The distant communication between device in the field (transmitter) and the monitoring device in the hand of farmer (receiver) is performed by radio frequency communication (NRF module), and parameters are measured with the help of (4) four designated sensors so farmer can water crop from a distant place and monitor it by the signal display on LCD. These four sensors work together at different participation ratios on the basis of PID controller programming using Radio Frequency Communication using NRF Module and takes smart decision for irrigation.
Key Words: Irrigation system, PID Controllers, Arduino, PWM, PV Panel, Lead Acid Battery, Moisture level Sensor, Humidity Sensor, wind-speed Sensor, radiation sensors.

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