

AN ULTRA LOW POWERED MSP430 MICROCONTROLLER BASED CONTROL SYSTEM FOR COMPOSTING

A PROJECT REPORT

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ABSTRACT

This project presents the design of an intelligent controller for a composting process. Composting is a process by which organic material such as yard trimmings, kitchen scraps, wood shavings, cardboard, and paper is biodegraded by microorganisms, resulting in the production of organic and/or inorganic by-products and energy in the form of heat. As a result the temperature of the heap rises thereby speeding up the basic degradation process, which normally occurs slowly in organic waste. The final product is compost which is of significant value in agriculture. Moreover for the process to give significantly good quality compost the process parameters have to be properly monitored and adjusted. So a control system is designed around Texas Instruments ultra low powered MSP430FG4618 microcontroller chip. Composting provides environmentally and economically sustainable solution for promoting organic farming. This project creates a low cost and efficient control system for a compost manufacturing process which can be applied by farmers to produce nutrient rich, high quality organic fertilizer.

This system contains a composting reactor block in which the temperature is sensed by internal temperature sensor of the microcontroller. The oxygen concentration is also maintained using three DC-fans one is responsible for the exhaust of hot air(CO_2) and remaining two are used for allowing the fresh air to enter into the reactor. Thus through the controlled reaction of biodegradation process a fast, efficient and reliable composting fertilizer can be generated.