

Microcontroller-Based Two-Axis Solar Tracking System

Abstract:

The main goal of this project is to develop and implement a prototype of two-axis solar tracking system based on a microcontroller. The parabolic reflector or parabolic dish is constructed around two feet diameter to capture the sun's energy. The focus of the parabolic reflector is theoretically calculated down to an infinitesimally small point to get extremely high temperature. This two axis auto tracking system has also been constructed using microcontroller. The assembly programming language is used to interface the microcontroller with two-axis solar tracking system. The temperature at the focus of the parabolic reflector is measured with temperature probes. This auto-tracking system is controlled with two motors. The five light sensors are used to track the sun and to start the operation (Day/Night operation). Time Delays are used for stepping the motor and reaching the original position of the reflector. The two-axis solar tracking system is constructed with both hardware and software implementations. The designs of the gear and the parabolic reflector are carefully considered and precisely calculated.

Block diagram of this project

