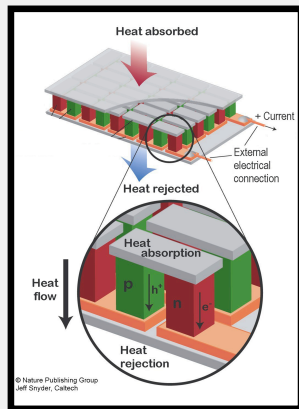


Concept:

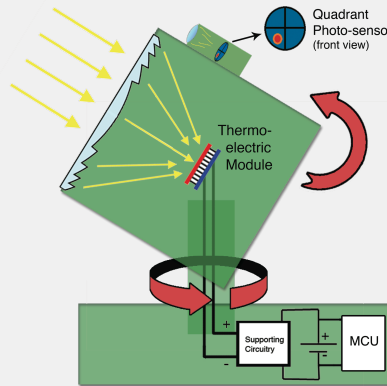
The unit will actively follow the location of the sun across the sky. A Fresnel lens concentrates the rays of the sun onto a copper plate that heats one side of the Thermoelectric Module (TEM); while the other side is cooled with the use of a low power fan. The heat flow across TEM results in current flow that can be stored in a battery for later use.

Thermoelectric Effect:

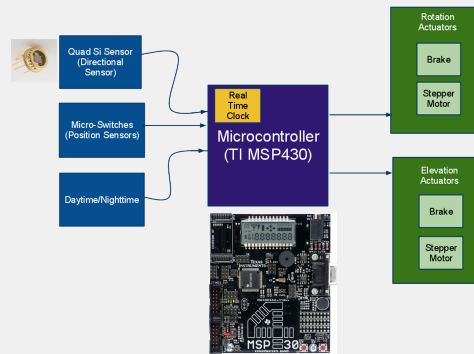


A TEM is a solid-state device that converts thermal energy from an applied temperature gradient into electrical energy. This method of generating electricity is called the Seebeck Effect. The flow of charge across the p-type and n-type material results in a net current.

System Operations:



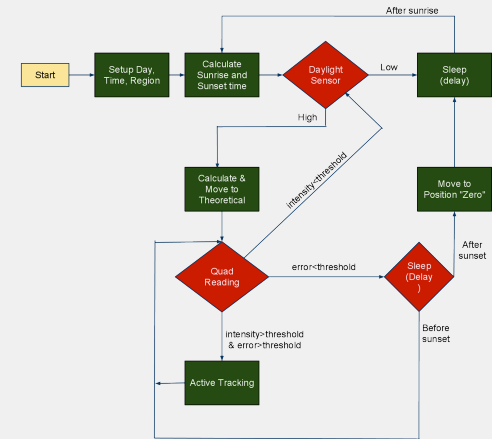
To maximize the power output from the TEM module, the device needs to actively track and face the sun. To achieve this goal, the unit contains a quad silicon sensor. The Micro-controller Unit (MCU) samples the quad-sensor and controls the motors to ensure that the Fresnel lens is directed straight at the sun.



Project Goal

Solar tracking via a combination of passive and active tracking. Active tracking is performed with the use of a quad-sensor and an efficient tracking algorithm.

Tracking Algorithm:



Test Run Data:

