

## Embodiment Design of an Azimuth-Altitude Solar Tracker

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**Abstract :** To provide an efficient solar generation system, the embodiment design of a two axis solar tracker for an array of photovoltaic (PV) panels destiny to supply the power demand on off-the-grid areas was developed. Photovoltaic cells have high costs in relation to t low efficiency; and while a lot of research and investment has been made to increases its efficiency a few points, there is a profitable solution that increases by 30-40% the annual power production: two axis solar trackers. A solar tracker is a device that supports a load in a perpendicular position toward the sun during daylight. Mounted on solar trackers, the solar panels remain perpendicular to the incoming sunlight at day and seasons so the maximum amount of energy is outputted. Through a preview research done it was justified why the generation of solar energy through photovoltaic panels mounted on dual axis structures is an attractive solution to bring electricity to remote off-the-grid areas. The work results are the embodiment design of an azimuth-altitude solar tracker to guide an array of photovoltaic panels based on a specific design methodology. The designed solar tracker is mounted on a pedestal that uses two slewing drives, with a nominal torque of 1950 Nm, to move a solar array that provides 3720 W from 12 PV panels.

**Keywords :** azimuth-altitude sun tracker, dual-axis solar tracker, photovoltaic system, solar energy, stand-alone power system

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