5. Conclusion and Recommendations

5.1 Conclusion:

A solar tracker is simulated and tested successfully, in that it achieved an overall power collection efficiency increase from the same panel on the tracking device. In terms of real value, this means that the overall cost of a system can be reduced significantly, considering that much more power can be supplied by the solar array coupled to a solar tracking device. By extracting more power from the same solar panel, the cost per watt is decreased, thereby rendering solar power much more cost-effective than previously achieved using fixed solar panels.

The controller design approaches are cost effective and flexible. The approaches are however better appreciated in environments such as academic or research institutions, where the software and hardware development tools are generally readily available without added cost.

By comparing the added cost during installation of the Zomeworks passive tracking system to the comparative power advantage offered at the location of the installation, it provides a fiscal evaluation as to whether installing the tracking system is a smart financial decision.

PID controller algorism is applied to the system in order to reduce the oscillation period and minimizing the error to the reference value (setpoint).

5.2 Recommendations:

I - The bigger is the gear ratio the minimum stepper motor ratings and that is to minimize the power consumption as minimum as possible and to improve breaking mechanism .

II - The dual axis is recommended upon large systems where a high power generation is required, that is because the annual axis increasing power during the year, so when considering a single solar panel of (36W) the saved power will be a very small fraction of that.

III – The mechanical faults are highly possible than electrical ones, so a dust and water prove sealing are important.

V – Carefully adjusting the value of (dt) to be in such a value obtain minimum number of stepper motor moves and high power gain.

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