



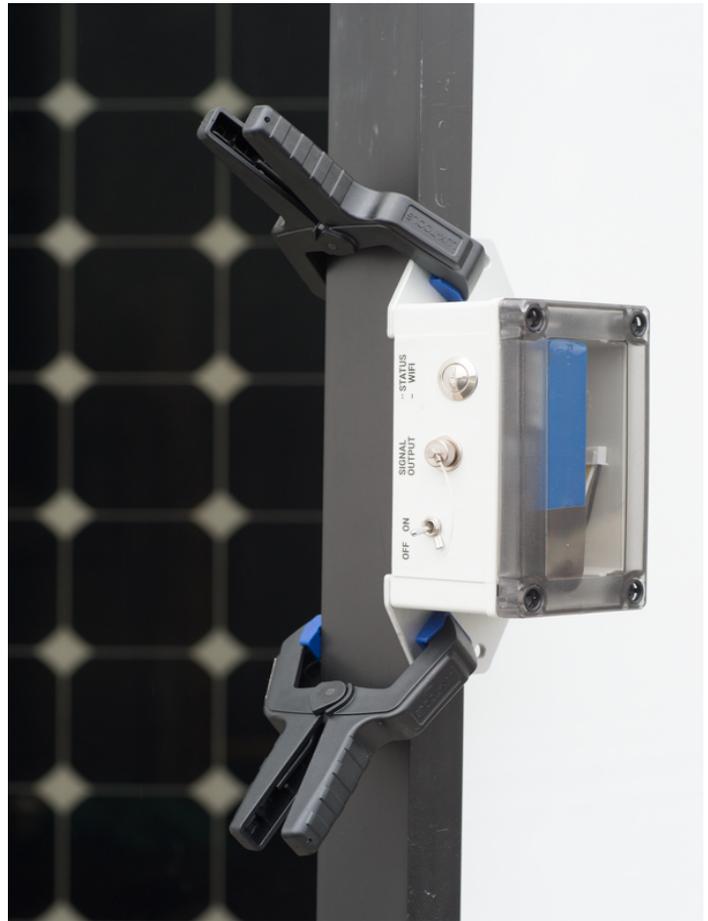
Solar Tracker Optimizer

STO is a system that tests and optimizes the tracking accuracy of single-axis solar trackers.

It accurately monitors second by second the inclination of PV modules, analytically calculates the deviation from the optimal tilt, and generates the tilt-correction parameters delivering optimized alignment and maximized energy production.

The optimal angle is calculated by the STO itself through a combined set of algorithms:

- (i) the ephemeris algorithm, which calculates the position of the sun on the basis of time and local GPS coordinates
- (ii) the shadowing algorithm, which calculates the mutual shadowing generated by adjacent trackers
- (iii) the ground tilt algorithm, which calculates the mutual mismatch due to the East-West tilt of ground in any possible ground configuration.



Maximizing energy production from single-axis solar trackers

- ✓ Suitable for all types of single-axis solar trackers
- ✓ Self-powered inclinometer
- ✓ Optimal tilt curve calculated also in uneven ground conditions
- ✓ Easy clamp-on installation
- ✓ Automatic calculation of the production loss (Kw/h) generated by the error detected with respect to the optimal tilt curve implementable

Optimal inclination, grow revenues

Very often the tracking accuracy of mono-axial systems is lower than expected. Minor undetected mismatches between the actual and the optimal tilt curve can easily cause the Performance Ratio to drop below the contracted value, resulting in financial penalties and in lost annual revenues ranging from tens of thousands of Euro for a 5 MW installation up to several million Euro for a GW plant.

STO has been conceived for delivering accurate insight on the tracking accuracy of such systems, and for optimizing their operating parameters during the phases of field test and of plant operation.

Applications

Testing and operation optimization of single-axis solar PV plants during the phases of field test and of operations.

STO has been tested and used by

Enel Green Power in all its worldwide largest PV plants (e.g. Finis Terrae - Chile, Ituverava - Brazil, and Villanueva - Mexico), delivering an average annual production increase between 2% and 5%.

STO is a **sunto** proprietary technology. Patent pending.