

# Mi-AxisTracker

Mi-AxisTracker is a horizontal single-axis tracker controller that optimizes photovoltaic (PV) panel orientation towards incoming solar rays to achieve maximum power output. Complementing this, the smart PV Monitoring System (PVMS) delivers advanced analytics and enables predictive maintenance, ensuring the entire solar farm continues to operate at peak efficiency.

## Technology Overview

The demand for efficient, reliable, and high-performing solar energy solutions has never been greater. The Mi-AxisTracker system represents a leap forward in solar harvesting technology. Designed as a Horizontal Single-Axis Tracker (HSAT), it intelligently follows the sun's path throughout the day, ensuring solar panels are optimally angled for maximum energy capture. Integrated with a dedicated controller and gateway, and supported by the advanced Cloud Photovoltaic Monitoring System (PVMS), the solution provides real-time insights into performance, angle, and operational status from any location. With integrated back-tracking functionality, the system automatically adjusts panel inclination to prevent self-shading, further enhancing overall energy output.

## Key Features

### Intelligent Control & Precision Tracking

- **Advanced Digital Controller**

At its heart lies a powerful STM32F411 microcontroller, ensuring precise and responsive tracking.

- **Sun Position Algorithm**

Real-time adjustments based on the sun's exact position maximise energy capture throughout the day, delivering up to 25% higher energy yield compared to fixed-tilt systems.

- **Flexible Control**

Supports manual overrides for specific operational needs and integrates seamlessly via RS-485 and Modbus protocols.

- **Proactive Fault Detection**

Monitors for issues like motor malfunctions or sensor failures, enabling timely intervention and minimising downtime.

- **Cloud PVMS**

Monitor angle, real-time performance, and non-motor fault conditions remotely via Wi-Fi, putting control at your fingertips.

## Robust Mechanical Design & Optimized Performance

- **Durable & Stable Structure**

Engineered to support up to 80 high-efficiency bifacial solar panels, designed for long-term stability and resilience in various environmental conditions.

- **High-Precision Motorised System**

A powerful 0.5 to 1 kW motor ensures precise tracking with an accuracy of  $\pm 0.2^\circ$  and a wide tracking angle range of  $60^\circ$  to  $-60^\circ$ .

- **Optimised Power Output**

Designed for systems up to 48kWp, complemented by a 40kW three-phase grid-tie inverter with over 98% efficiency and multiple MPPT inputs for maximum energy harvesting. Uncompromised Safety & Durability.

- **Comprehensive Safety Features**

Includes emergency stop, overload protection, and temperature shutdown to protect hardware and personnel.

- **Weather Resilient**

Features a dedicated "stow mode" for adverse weather conditions (high winds, heavy snow) and limit switch protection to prevent mechanical over-rotation.

- **Certified Reliability**

Achieves an IP65 rating for superior dust and water resistance, and complies with stringent international standards including IEC 62817.



## Technology Benefits

- **Maximised ROI**

Significantly higher energy yields translate directly into faster payback periods and greater profitability.

- **Seamless Integration**

Designed for easy installation and compatibility with existing infrastructure.

- **Unmatched Reliability**

Built with high-quality components and rigorous testing for continuous, dependable operation.

- **Comprehensive Support**

Backed by robust system security, user-friendly design, and a comprehensive warranty for peace of mind.

## Applications

- **Utility-Scale Solar Farms**

The primary application, where maximising generation per acre is paramount for grid-connected projects.

- **Large-Scale Commercial & Industrial Installations**

Ideal for businesses with significant land availability looking to offset high energy consumption and reduce operational costs.

- **Agricultural Solar (Agrivoltaics)**

Enables dual-use of land by optimising solar energy production while allowing for certain agricultural activities (e.g., grazing, specific crop cultivation) beneath the panels.

- **Community Solar Projects**

Provides higher energy output for local shared solar arrays, maximising benefits for community members.

- **Remote Power Generation & Off-Grid Solutions**

Crucial for applications where reliable and maximised energy harvest from a limited footprint is essential.

- **Mining Operations & Industrial Parks**

Addresses high energy demands in often remote or expansive industrial settings.

- **Water Treatment Facilities**

Utilises large land areas to generate clean energy, reducing operational expenses.

