



HORIZONTAL SINGLE AXIS TRACKER



Less than 10% increase in CAPEX*
Up to **25%** more energy production

* CAPEX: Κεφαλαιακές Δαπάνες



METATRACKER

The hydraulic MetaTracker is one of the most well-designed and versatile solar tracking photovoltaic mounting options, and is supported in design and construction by a specialized engineering department in all applications, both in Greece and abroad.

COMPLETELY AUTONOMOUS

Each composite structural item of the installation (table) has its own power unit, and works independently from adjacent tables. Each table can reach up to 150m in length and 4,1m in width. The MetaTracker is completely self-powered as it is able to take the required energy either from the closest PV string (recommended) or a dedicated small (30Wp) PV module. The telemetry and remote control communications are implemented using LoRa wireless technology so there is no need for cabling.

ENGINEERED TO LAST

HYDRAULIC DRIVE

The MetaTracker uses a hydraulic drive which, despite its higher initial cost compared to electric drives, is the only safe choice for harsh environments (proven for decades in earth-moving machinery). The hydraulic circuit is isolated from the environment and the hydraulic oil is constantly filtered by a micro-filter. This makes the operation possible even in the thin dust of a desert, securing reliable and low maintenance operation for many years.

DISTRIBUTED MECHANICAL LOADING

Depending on its length the tracker can have up to 6 actuators, where each actuator drives a 1/6 sector of the total length. This means that the maximum free rotating length on each side of the actuator is less than 12,5m. This very short free rotating length (unlike most other available solutions) gives exceptional torsional stability and zero backlash in alternating eccentric loads which usually occur during extreme wind conditions. This high torsional stability eliminates the need for stabilizers or shock absorbers.

EASY MAINTENANCE

All moving joints are made from a combination of stainless steel and bronze components and they do not require any kind of maintenance throughout the service life of the machine.

A change of the hydraulic oil and filter is required every 5 years. All drive and control components can be removed and replaced in a few minutes, without disrupting the operation of the rest of the plant and without the need to dismantle the table.

EASY INSTALLATION

FLEXIBILITY

We have optimized every step of the procedure. There is no need for field work (drilling, cutting, welding, etc.), and no need for decisions during assembly, thus eliminating installation errors and the need for expert staff. The innovative Six-Axis Hinge can absorb up to 10cm of foundation pole misplacement in any direction, it also makes installation on areas with extreme slopes possible. MetaTracker can be installed on slopes of up to 15° in the North-South direction, and on unlimited slope in the East-West direction.

The tables are independent from one another and can have different lengths, thus making distribution of trackers in irregular fields very easy. The lack of power and communication cabling, reduces the installations costs and time. The MetaTracker foundation and assembling costs are kept similar to - or in many cases even lower than - that of a fixed PV system installation.

DENSE PLACEMENT

Since the Six-Axis Hinge and the rotation mechanism does not interfere with the PV modules during operation, there are no gaps between the PV modules, making the MetaTracker the solution with the best ground coverage ratio in the market.

INNOVATIVE SOFTWARE

CONTROL

The MetaTracker is equipped with an advanced control system. A single Master Controller can control and communicate wirelessly with up to 256 MetaTracker trackers. The Master Controller, incorporates an anemometer and a GPS receiver. By using the time and position information from the GPS, the Master Controller solves the astronomical algorithm to find the sun's position. Then the Master Controller applies the backtracking rules and if the wind speed or the snow is within safe limits, it broadcasts the optimum position to each table.

TELEMETRY

The Master Controller connects the plant to the Internet through Wi-Fi or Ethernet TCP/IP connection. The owner or the plant operator can have access to the plant through any web browser. There are several user access levels available to suit any security needs (viewer, operator, superuser). The users are able to interact with the trackers and make movements or perform any test they wish.

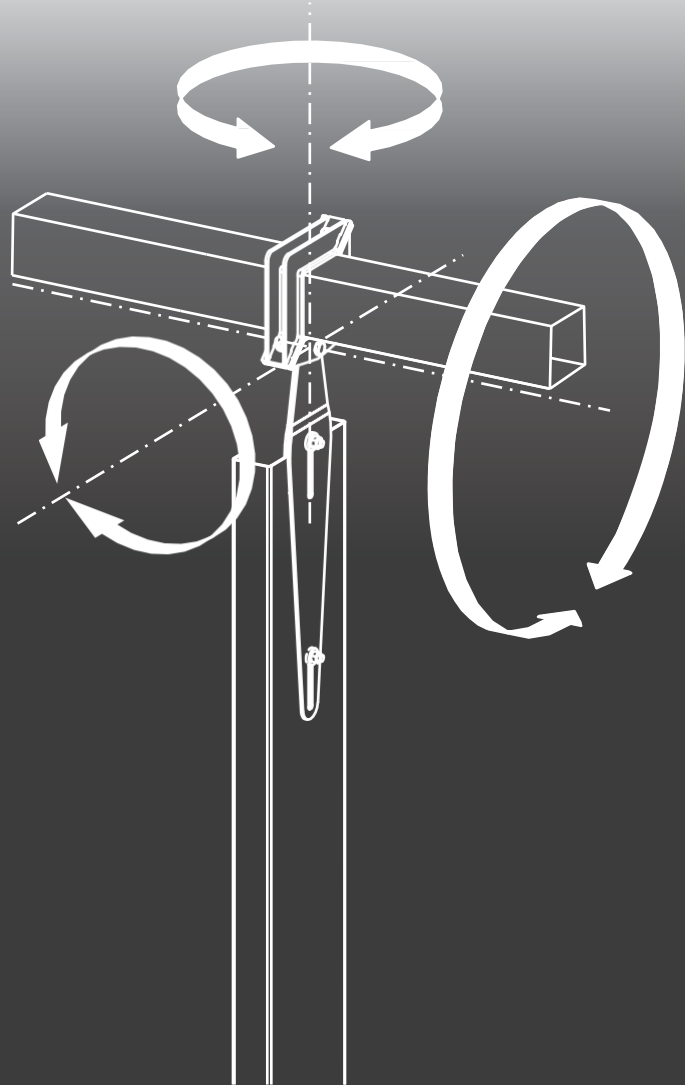
If an error occurs, the Master Controller can inform the operators by sending a message which contains a description and the probable cause of the error. Messages can be sent via SMS or E-mail.

BACKTRACKING

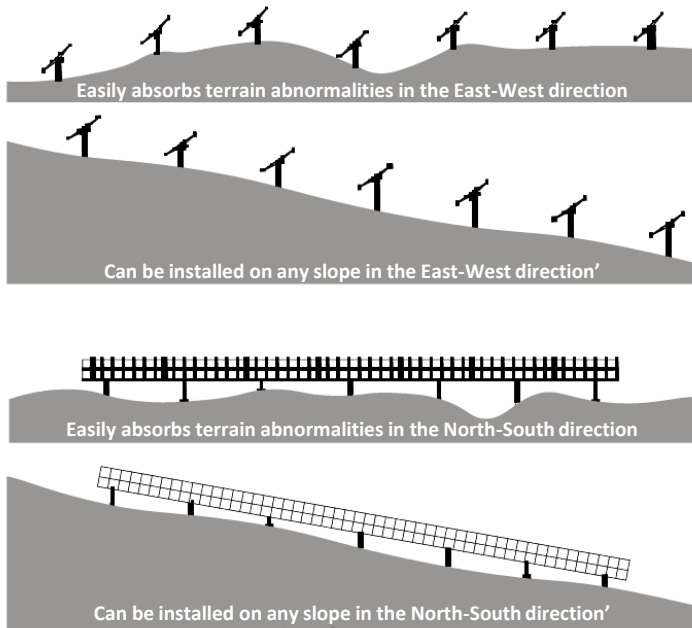
During the first or the last hours of the day, where the sun is close to the horizon, the Master Controller continuously adjusts the slope of the modules as to prevent the tables from casting shadows on each other.



STAINLESS STEEL BALL BEARINGS
ENABLE SEAMLESS OPERATION &
EASY INSTALLATION EVEN IN THE
MOST EXTREME SLOPES.



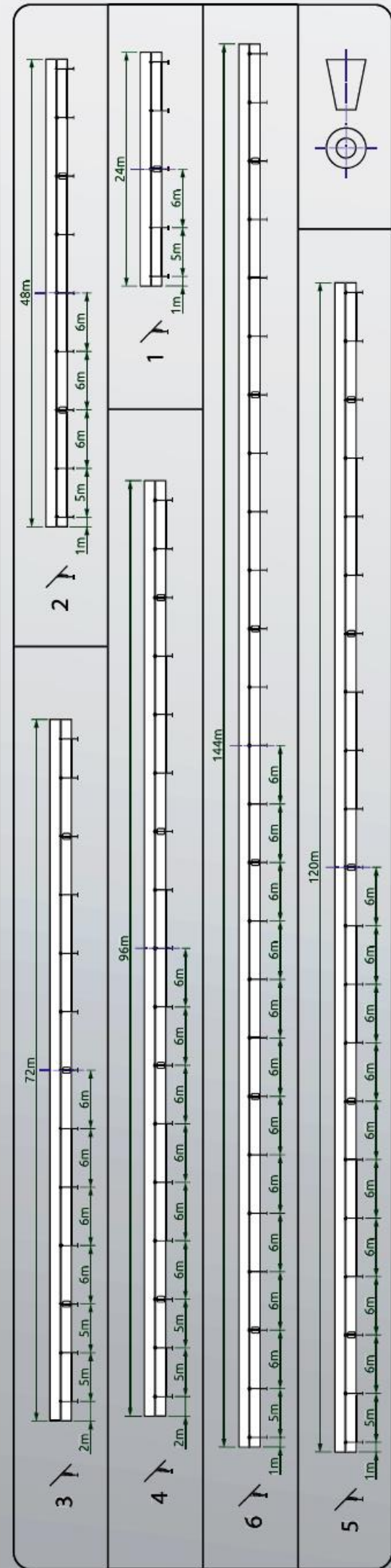
SUITABLE FOR ANY TERRAIN



7 FOUNDATION OPTIONS

			OPTION 1 Single Pole On Counterweight
			OPTION 2 Triangular Mounting On Counterweight
			OPTION 3 Single Rammed Pole
			OPTION 4 Triangular Mounting On Rammed Poles
			OPTION 5 Single Pole in Concrete Pile
			OPTION 6 Triangular Mounting On Concrete Piles
			OPTION 7 Triangular Mounting Directly On Underlying Structures

FLEXIBLE TABLE LENGTH ARRANGEMENTS



GEAR-LESS DRIVE

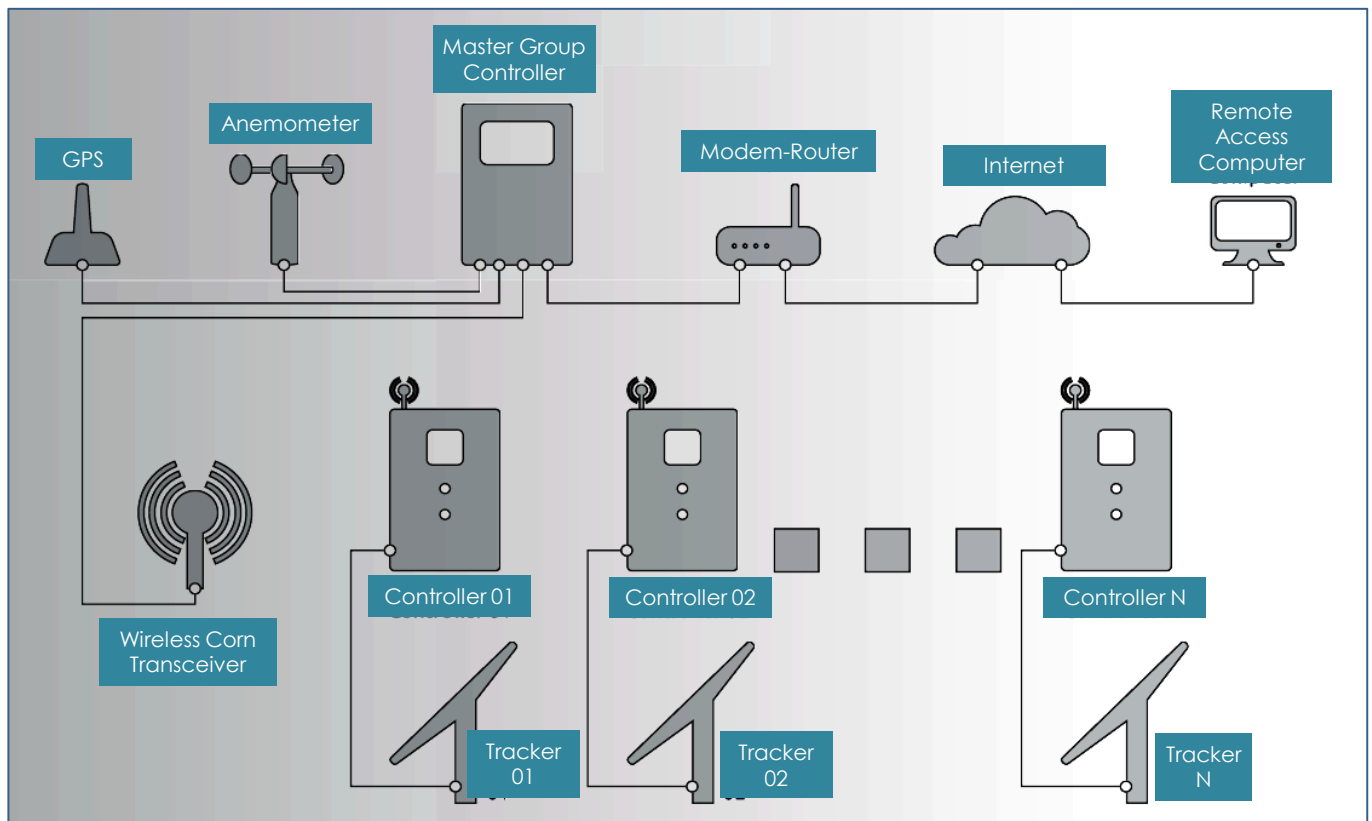
SMARTSENSING

The Tracker Controller continuously monitors the pressure on both ends of the hydraulic actuator. During normal operation, the pressure inside the cylinder usually does not exceed 1/4 of its rated load capacity. If the pressure increases above expected limits, the control will generate warnings and, if the pressure reaches 80% of the rated load capacity, the Tracker Controller will automatically drive the frame to the horizontal position. For example after a heavy 1.5m night snowfall, the center of gravity of the snow mass will be 0.75m above the rotation center. During the morning movement of the tracker east, this overcenter load can create torque (on the main carrier) and forces (to actuators) above the rated capacity. Furthermore, after a critical angle, the actuators aren't able even to return to the horizontal. SMARTSENSING protects the plant from such situations.



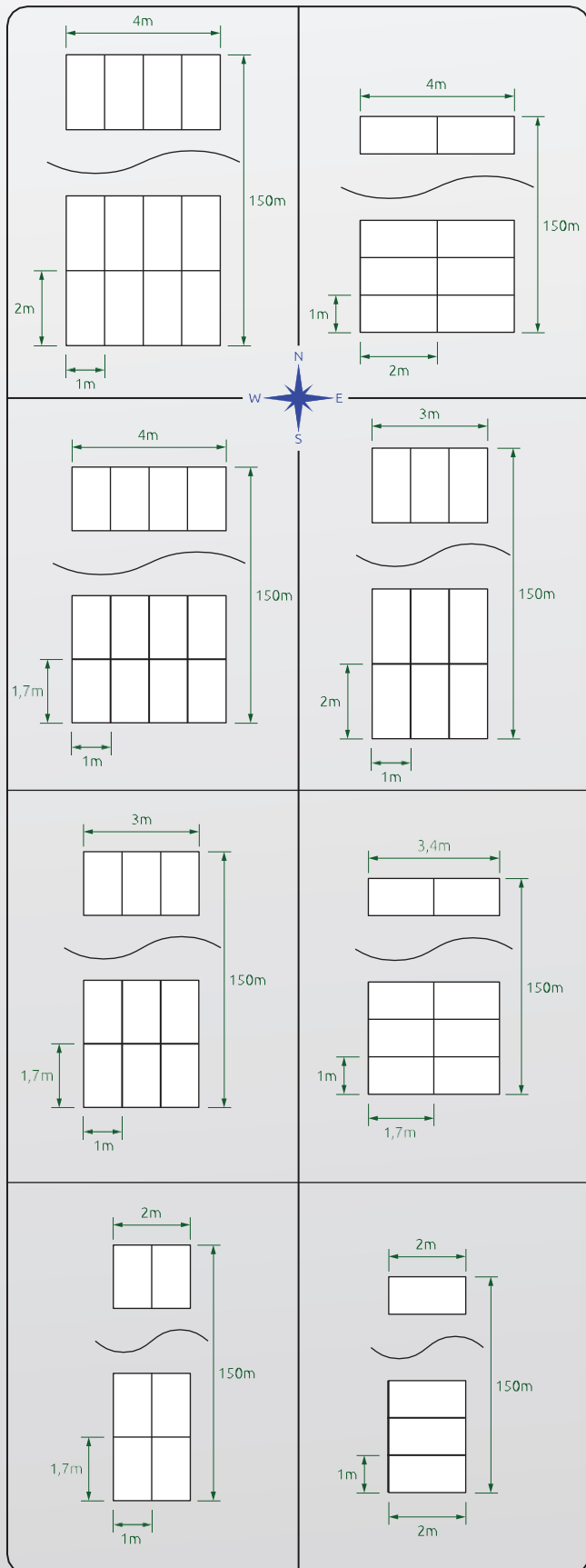
WIRELESS AND ELECTRICALLY AUTONOMOUS

Each tracker is electrically autonomous. It uses PV power and communicates via LoRa wireless technology.



MetaTracker Plant System Diagram

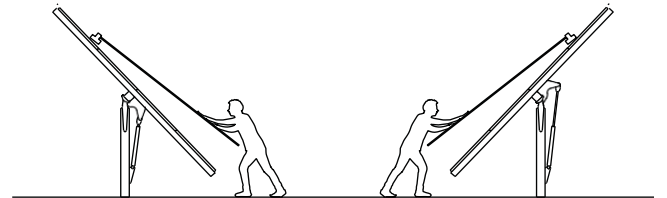
8 PV MODULE INSTALLATION CONFIGURATIONS



INDEPENDENT MOVEMENT

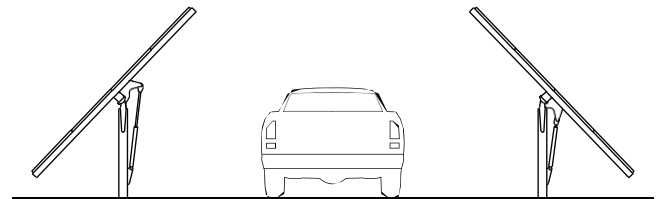
CLEANING MODE

The PV cleaners can enable the Cleaning Mode for the lane(s) they want to clean. When cleaning mode is enabled the two tables of a lane assume a preset slope that is suitable for cleaning (e.g. maximum slope facing east, or maximum slope in the opposite direction, etc.).

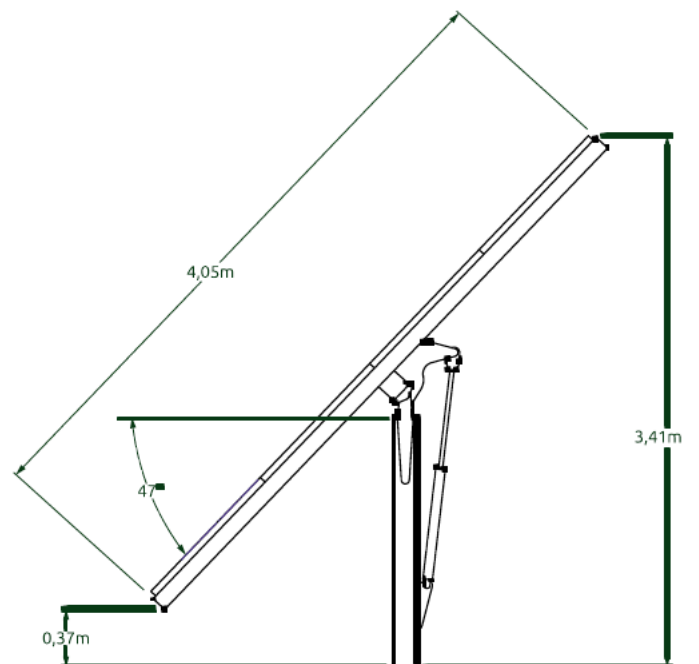


PASS-THROUGH MODE

When maintenance vehicles or other heavy equipment need to pass through a lane, Pass-Through Mode instructs the two lane tracker tables to angle away from the lane to make passing-through easier.



GENERAL DIMENSIONS



INVESTMENT OUTLOOK

Boost Your Earnings

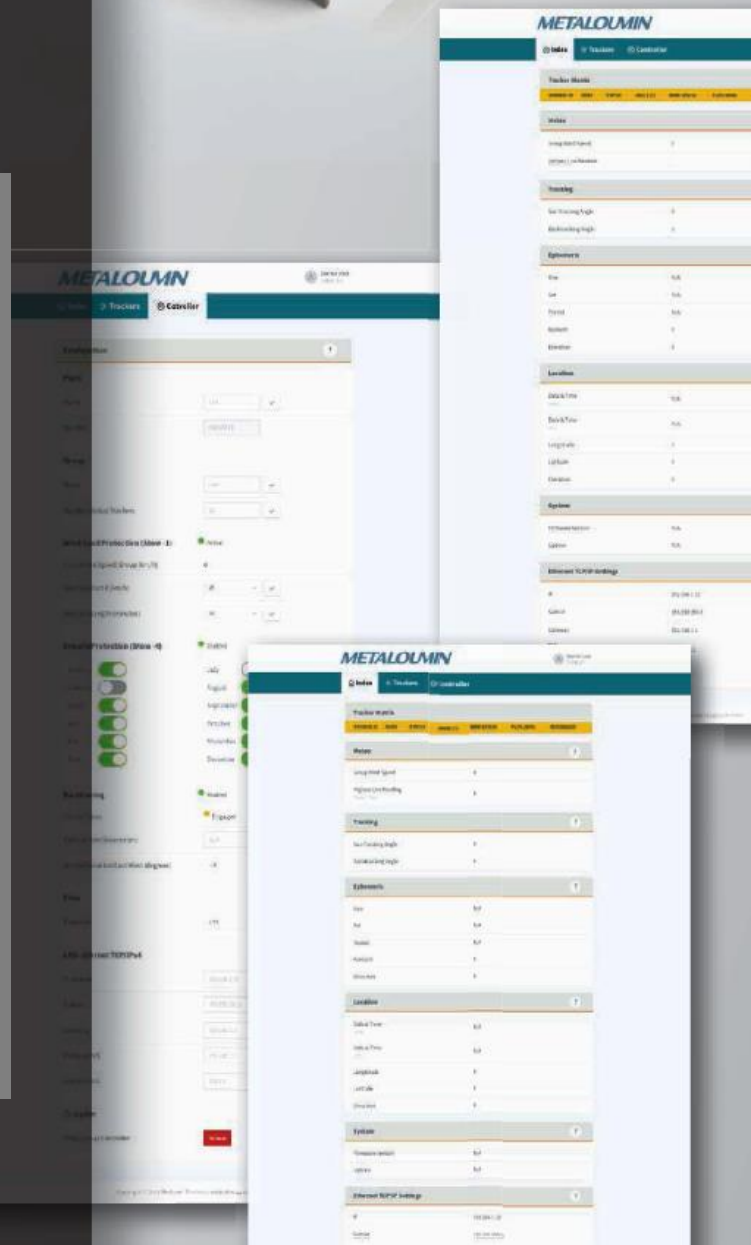
The investment cost of a MetaTracker is around 10% higher than that of an equal capacity fixed PV installation, while the power production increase is between 15% - 25%. As a result, if an investor has a fixed size license with an attractive feed-in tariff, he can invest more money, while enjoying a better IRR and NPV on the investment. If an investor has fixed investment capital, production will be 5% to 15% higher, again pushing the IRR and the NPV of the investment higher. The MetaTracker's design is based on our accumulated design knowledge and extensive field experience. Every detail has been thoroughly engineered to have the minimum impact on the levelized cost of electricity (LCOE).



Prepare for the Future

A tracker's energy production curve is almost constant throughout the day, in contrast to a fixed PV installation that produces most of the energy during noon. In many countries, there is already a surplus of energy production at noon and a lack of energy production in the morning and afternoon. This phenomenon will be intensified in the next decades, as solar energy increases its share of total electricity generation. Also after the end of existing Power Purchase Agreements, solar producers will lose the benefit of feed-in tariff and will sell energy at prices driven by the competition. Producers whose installations' production curve better matches the demand, will have an advantage during price negotiations.

The MetaTracker also reduces the CAPEX and the LCOE in installations that implement energy storage, since the increase in production hours equals a proportional reduction in energy storage needs.



METATRACKER



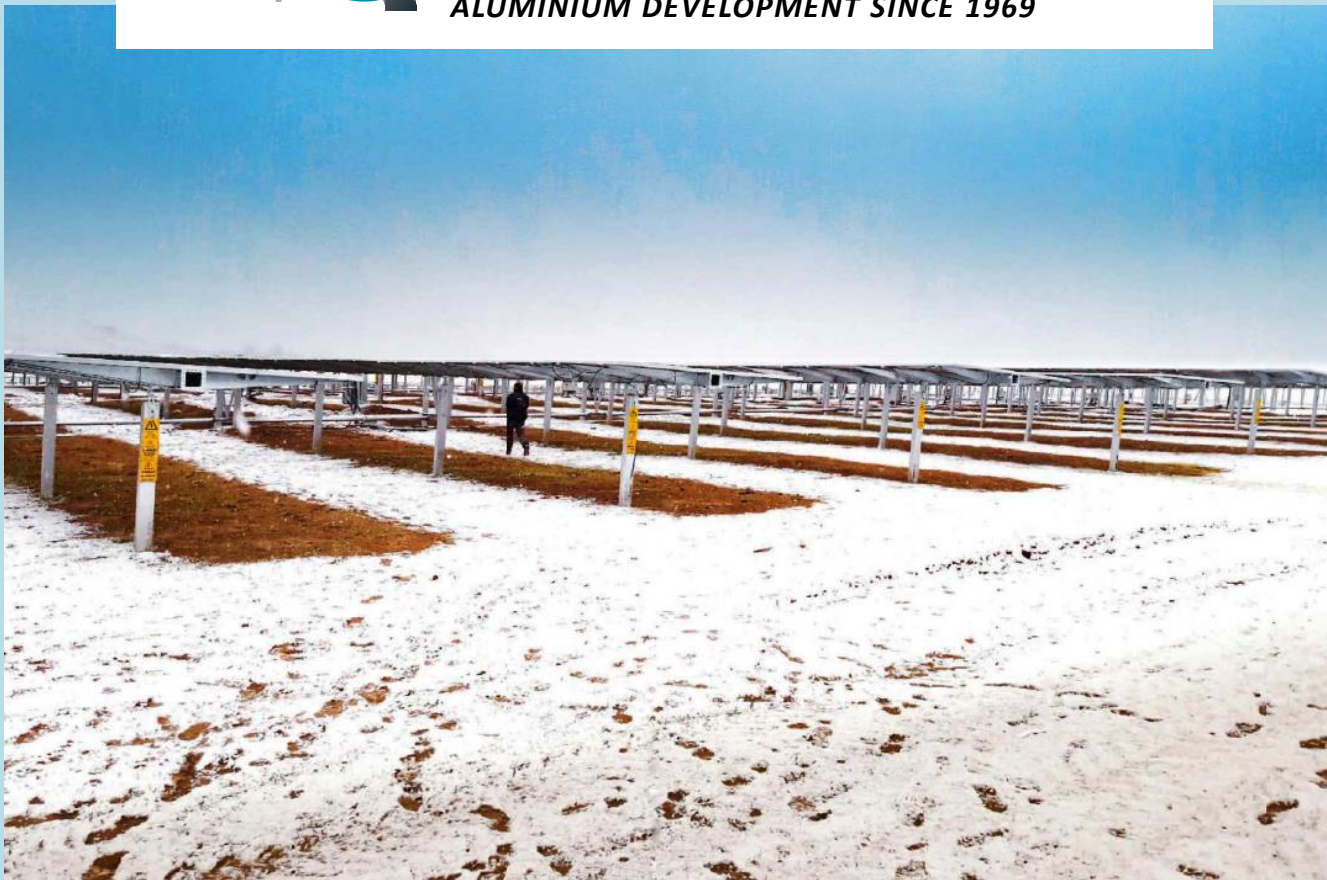
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ALUMINIUM DEVELOPMENT SINCE 1969



TYPICAL INSTALLATIONS
VARIOUS RANGES

META TRACKER

 **METALOUMIN**
ALUMINIUM DEVELOPMENT SINCE 1969



TURKEY – 10MW

META TRACKER



METALOUMIN

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TURKEY – 10MW
VIEWS

META TRACKER



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THEBES, GREECE – 1MW

META TRACKER

METALOU MIN
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FOKIDA, GREECE – 500kW

META TRACKER



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MODEL INSTALLATION
HUNGARY

NAFPAKTOS
GREECE

SPECIFICATIONS

MAIN CHARACTERISTICS

- Type: Autonomous, horizontal single-axis solar tracker (rotation axis orientation south to north parallel to the ground)
- Range of motion: -45° to +45°
- Maximum surface area: 600 m²

INSTALLATION CHARACTERISTICS

- Possible Foundations:
 - Rammed pole
 - Concrete pile
 - Concrete ballast
 - Direct mounting on structures
- Min. distance from ground during operation: 0,37 m
- Max. height during operation: 3.41 m
- Ground coverage ratio: adjustable (recommended 50%)
- Max north-south field slope: 15°
- Unlimited east-west field slope

ELECTRICAL CHARACTERISTICS

- Autonomous design using solar power
- 0,2 kWh battery included
- No need for connection to the main power grid

DRIVE

- Type: Hydraulic
- Maintenance:
 - Visual annual inspection
 - Hydraulic oil and filter change every 5 years

CONTROL

- Tracking method: Astronomical algorithm
- Tracking accuracy: 1 °
- Measuring system: Inclinometer
- Backtracking: Yes
- Monitoring and remote handling: Full, in real time through the Internet
- Plug & Play: uses GPS for time and location
- Wireless communication, no need for bus wiring

SAFETY

- Active Safety Features (Stow)
 - Wind speed protection
 - Snow load protection
- Operating conditions: up 50 km/h at any tracking angle and wind orientation

STRUCTURE

- Drive: Hydraulic parts sealed from the environment.
- Able to operate in desert environment and in any combination of dust and moisture
- Structural steel elements: Hot-dip galvanized
- Joints: Dry slide stainless steel spherical bearings (no maintenance required)

ENVIRONMENTAL CONDITIONS

- Operation temperature range: -20 °C to +60 °C
- Snow rating: 160 kg/m²



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