

Product Spotlight



# Raising the bar with a reliable tracker system built to weather the test of time

Top community solar provider is first to build expanded tracker offering



Located in Lostant, Illinois, in LaSalle County, Solitude II is a 3-MW community solar project brought to life by Nexamp, a solar developer that works with communities, businesses, and municipalities to democratize clean energy and support U.S. energy independence. As one of the leading clean energy providers within the community solar industry, Nexamp has a long history of working hand in hand with Terrasmart to kickstart new solar opportunities.

As a key partner of Terrasmart who has installed over 150 MWs of TerraTrak 2P, Nexamp was keen to utilize TerraTrak 1P for its value-engineered, wind-resilient design and ease of installation.

# Project planning challenges and concerns

Determining the best-fit racking solution for Solitude II started with understanding the dirt and weather. Before deciding on the best-fit products to use and the optimal design layout for the site, it was critical to learn more about the site's topography, subsurface conditions, risk of frost heave, and weather challenges.

During the planning stage, tools such as a geotechnical report and pull test can help you better understand subsurface conditions. In addition to this, Terrasmart's proprietary engineering tool helps to determine site-specific wind and snow loads, ensuring an optimized design. Over 10,000 wind coefficient values are processed for a single project, in conjunction with an average of 63 different load combinations. This allows our engineers to accurately calculate the peak load combinations for each unique site based on the project's terrain, topography, and location. With real-time feedback, this automated tool helps to determine design elements, such as optimal foundation positions and torque tube size. Essential design elements are processed through this system and analyzed to determine the best configuration for a project's needs.

In addition to accommodating site-specific requirements, developers continue to face challenges and industry hurdles, such as rising costs, installation speed, reliability, ease of O&M, and hitting energy goals. Finding a reliable solar racking partner that can fulfill all of these criteria makes all the difference in determining the success of a project.

## Why TerraTrak 1P?

With an unbiased view of 1P vs 2P tracker configurations, our engineers were highly equipped to advise Nexamp on the best-fit solution for the Solitude II site.

With a focus on reducing project costs through fewer parts and efficient installation, we found that TerraTrak 1P was the best solution for the site's 10% grade and flat topography. TerraTrak 1P was selected for the following reasons:

### 1 Fewer foundations, lower costs

For this project, the two-string rows required seven foundations, while the one-string rows required only four foundations. This is because TerraTrak 1P's zero-degree stow reduces static and dynamic wind loads, resulting in fewer foundations per MW. This, in turn, results in fewer materials needed and faster installation, saving time and money for the developer.

### 2 30% fewer components, faster installation

TerraTrak 1P's new spherical bushings have resulted in a 73% reduction in bushing assembly parts, ensuring a quicker and more efficient installation process. The spherical shape allows for more tolerances and efficient torque tube alignment, making it easier to install.

The tracker's easy wire management design also helps to facilitate faster wire installation and save on skilled labor. Additionally, the efficient wire layout requires fewer materials and ensures long-term safety and reliability by routing the wiring along the torque tube.



### 3 Aerodynamic stability

Our engineering team spent over 500 hours conducting wind tunnel testing in collaboration with RWDI to determine the optimal balance of wing length, stiffness, and damping. This led us to determine that a zero-degree stow angle would greatly reduce static and dynamic wind forces, while dampers would ensure aeroelastic stability.

Through our resilient design, TerraTrak 1P can easily withstand the 105 mph wind load incurred at Lostant, Illinois.

To learn more about our wind tunnel testing process and how we achieved our optimized TerraTrak 1P design, click [here](#).

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### 4 Versatile above and below grade

TerraTrak 1P is easily paired with driven pile or ground screw foundations. In this case, we paired the tracker with our patented ground screws to eliminate the risk of refusal.

Our trackers are designed with screw extensions that allow for up to 36 inches of vertical adjustability. This allows our ground screws to have varying heights based on the site's topography—particularly on undulating terrain. This adaptability allows the field team to adjust in real time and speed up the installation process.

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### 5 The PeakYield™ advantage

TerraTrak 1P works in tandem with PeakYield™, our intelligent software designed to deliver increased energy yield, protect assets in inclement weather, and minimize downtime. It maneuvers each tracker row to limit shading—maintaining optimum exposure and production to maximize project efficiency and value. Terrasmart's system includes a weather station, network controller, and one row box per tracker row that all work together to give you real-time data on your site's performance.

What **PeakYield™** offers:

## **Backtracking with machine learning**

### *Reduced shading and increased energy production*

PeakYield™ features an advanced backtracking algorithm that minimizes row-to-row shading. By utilizing configuration parameters and the angle of the sun, it can determine how a row should be positioned to avoid shading its neighbor, while also considering the terrain of the row directly to its east and west.

Smart machine learning and historical data build a projection of where the sun will be at different times of the day, and then optimize the module positions to gain maximum energy yield.

## **On-site weather stations and smart weather forecasting**

### *Minimize weather risks*

On-site weather stations come equipped with sensors that send data to the network controller, which commands sites to stow when wind and snow thresholds are crossed. Meanwhile, advanced weather API predicts when bad weather is coming and stows sites, preventing damage. TerraTrak 1P comes with a snow shed feature to avoid a heavy snow build-up in winter when the tracker is in a stowed position.

## **Predictive analytics and remote access**

### *Faster troubleshooting and easier O&M*

PeakYield™'s machine learning algorithm can detect when a row is not tracking properly and alert you early —enabling you to fix issues before they affect site performance. The system can alert you earlier if it detects battery or motor issues, so that you can proactively plan maintenance and reduce downtime.

Real-time data down to row level paired with historical data allows for remote troubleshooting and quick diagnosis. The Admin Panel allows users to see inside the project site, view real-time data, and investigate historical data that often leads to identification of the issue at hand.

## **User-friendly dashboard**

### *Real-time monitoring*

See how sites are always performing via a user-friendly dashboard. A project map within the dashboard provides a quick red or green status for an easy overview of your sites. View it from your desktop or mobile device, which pushes issues to the top and sends immediate email and SMS notifications.

## **The result: a tracker built for reliability**

With our site-specific customization capabilities, intelligent PeakYield™ software, and adaptable TerraTrak racking, we were able to provide Nexamp with a reliable, cost-effective tracker solution that will stand the test of time.

Our seasoned team of experts installed 5,616 modules and 2,016 ground screws, completing the project on time and on budget.

## 12 key questions to ask your tracker solution provider

The right tracker partner should be capable of demonstrating the results of their thorough wind tunnel testing and have a comprehensive offering that can meet the specific needs of your project, ensuring long-term reliability.

Consider these screening questions when vetting your tracker solution provider:



Has the tracker manufacturer conducted comprehensive multi-row static, dynamic, and aeroelastic wind tunnel tests within the past few years?



Can the tracker manufacturer demonstrate that their tracker design adheres to the tolerances specified in their wind tunnel studies (e.g. array height, chord length, tracker length, GCR, natural frequency, damping, tracker length)?



Can the tracker manufacturer provide evidence that their design accounts for all specified pressures and wind tunnel-specific load combinations beyond standard building code requirements?



If dampers are required for the tracker manufacturer's design, can they confirm that dampers were included in the aeroelastic wind tunnel tests and that the tested dampers accurately represent the final damper design?



Has the full-scale tracker undergone thorough pluck testing?



Has the tracker manufacturer performed component-level testing on each individual connection and system-level testing on full sub-assemblies and the entire tracker, and can they supply reports?



Has the tracker manufacturer tested module-specific compatibility with their tracker design, and can they supply reports?



Has the tracker manufacturer conducted full-scale lifecycle testing, and can they supply reports?



Does the system exhibit slight twisting under extremely low loads (e.g. a person pushing on it), giving it a "loose" feel?



Can the tracker be customized to meet project-specific requirements?



Is the system capable of remote upgrades, enabling continuous improvements over time?



Can you access sites remotely for easy troubleshooting?

# Breeze forward with the right tracker partner

When selecting a tracker partner, consider a team with both 1P and 2P tracker expertise that can provide an unbiased recommendation and the best solution for your site.

Mitigate tracker failure and maximize the value of your site by partnering with a tracker solution provider that has not only conducted in-depth research and testing beyond the industry standard, but also has the in-field experience and advanced engineering capabilities to ensure the longevity of your solar projects.



Talk to our experts today



## About Terrasmart

Terrasmart, the renewable energy portfolio of Gibraltar (NASDAQ: ROCK), is a leading provider of solar racking technologies, electrical balance-of-system products, installation services, and project optimization software. Serving the commercial and utility sectors across North America, Terrasmart integrates products and solutions across the PV lifecycle to minimize risks and maximize returns. With over 20 GWs of solar deployed across 4,900 PV systems, Terrasmart creates unique value for more profitable solar anywhere. Visit [terrasmart.com](https://terrasmart.com).

