Quality Solar Racking Equipment

For over 15 years Sentinel Solar has been designing and manufacturing solar racking equipment in Canada.
Sentinel provides comprehensive solutions, rather than just a collection of parts. This is what sets us apart in this industry.

ADAM WEBB
President of Sentinel Solar
President Message

A pioneer of the solar industry in Canada, Adam Webb has seen the growth of solar renewable energy spread from simple off-grid cottages, to full scale utility power plants and he does not see it stopping.

We are here to enable your business. We care about the environment and believe solar power and clean energy storage is the most sustainable option for our energy futures.

We have been building our reputation in Canada for over a decade, and have done so without compromising on quality, reliability and ethical practices throughout our business.

Sentinel Solar is more than a company, it is a group of talented, dedicated professionals with an extensive knowledge base and profound industry skill set.

“Our vision and process of designing and developing, innovative, effective and robust solar pv mounting systems is the core of our business. We have been doing it since day one and we will continue to do it far into the future.”

We excel at developing mounting systems designed for simplicity, elegance, and versatility. Heavy consideration is placed on how the installer sees the product, it’s usefulness and it’s efficiency.

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Titan Lite

The Titan Lite is a fixed ground mount system. It is designed for light to medium duty installations where wind and snow loading is moderate. It comes in four base models. The system integrates with our Typhoon module mounting rail in order to support all standard 60 or 72-cell modules.

Features

The Titan Lite is equipped with key features that offer more functionality than a traditional fixed ground mount system.

1. **FEWER PARTS**
   - The Titan Lite consists of only a few components. This reduces the cost of manufacturing, shipping and installation.

2. **BASE SUPPORT**
   - The Titan Lite can be installed on concrete pads, piers, wooden trusses, ground screws, helical piles and cylindrical piles.

3. **FIXED TILT**
   - The Titan Lite provides the ability to set your desired fixed tilt angle between 35°-55°, in 5° increments, at the time of installation.

4. **TYPHOON INTEGRATION**
   - The sharing design of the Typhoon module mounting rail allows the Titan Lite to support all standard 60, or 72-cell pv modules.
The Titan Lite is hands-down the fastest system to build out of any ground mounts we’ve installed.

The Titan Lite supports a variety of layouts and configurations to meet your energy demands. Simply remove, slide, center, offset, or stagger the pv modules of the array to suit your desired aesthetic, or functionality.

The unique design of the Titan Lite foot provides support for mounting the system to a variety of bases, or materials. The foot can be installed using anchor bolts, or lag screws.
Titan AF

The Titan AF is an adjustable ground mount system designed for heavy duty installations. It offers durability in the harshest environments. It comes in four base models. The system has been integrated with our Typhoon module mounting rail in order to support all standard 60 or 72-cell modules.

Features

The Titan AF is equipped with key features that offer more functionality than a traditional fixed ground mount system.

1. ROBUST

The Titan AF is built out of heavy gauge galvanized steel that can withstand the harshest of Canadian weather.

2. ADJUSTABLE TILT

Built-in adjustment can alter the tilt elevation of the array and maximize production yield according to each season’s sun angle.

3. MODULAR

The design of the Titan AF allows for expandability by doubling the array size with fewer components.

4. TYPHOON™ INTEGRATION

The sharing design of the Typhoon module mounting rail supports all standard 60, or 72-cell pv modules.
<table>
<thead>
<tr>
<th>Specifications</th>
<th>Titan AF 2P60</th>
<th>Titan AF 3P60</th>
<th>Titan AF 2L72</th>
<th>Titan AF 3L72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td>10-16 x 60 Cell Modules</td>
<td>16-24 x 60 Cell Modules</td>
<td>9-12 x 72 Cell Modules</td>
<td>12-18 x 72 Cell Modules</td>
</tr>
<tr>
<td>Module Mounting</td>
<td>Typhoon Rail + Top Clamp</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilt Range</td>
<td>20° to 60°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tilt Mechanism</td>
<td>Manual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Wind Load</td>
<td>200km/h</td>
<td></td>
<td></td>
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<tr>
<td>Max Snow Load</td>
<td>Up to 50 psf</td>
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<tr>
<td>Base Installation</td>
<td>Pier Base / Pad Base</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Galvanized steel, Aluminum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Material</td>
<td>Galvanized, Stainless steel, Zinc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding Method</td>
<td>Integrated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Component Weight</td>
<td>230lbs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Weight</td>
<td>1400 lbs.</td>
<td>1500lbs.</td>
<td>1700lbs.</td>
<td>1800lbs.</td>
</tr>
</tbody>
</table>

East coast weather can be unrelenting, the Titan AF is the strongest ground mount we’ve installed.

PERFECT PAIRINGS

The Titan AF is designed for use with bifacial pv modules. With the integrated Typhoon module mounting rail which eliminates rear facing obstructions, bifacial pv modules are able to harness up to 20% more energy while installed on the Titan AF.
Titan SP

The Titan SP is a single pole adjustable ground mount system designed for medium duty installations. It comes in two base models. The system has been integrated with our Typhoon module mounting rail in order to support all standard 60 or 72-cell modules.

Features

The Titan SP is equipped with key features that offer a unique set of advantages over a typical ground mount system.

1. **BASE SUPPORT**
   - The Titan SP supports various support post types including concrete embedded, pile driven and rock anchored.

2. **ADJUSTABLE TILT**
   - Maximize production according to each season's sun angle with a built-in, manual, or power assisted adjustable tilt.

3. **SINGLE POLE**
   - The single pole design minimizes ground preparation costs and eliminates concerns over frost heaving or misaligned supports.

4. **TYphoon INTEGRATION**
   - The sharing design of the Typhoon module mounting system supports all standard 60, or 72-cell pv modules.
The Titan SP kept our ground prep costs down, and was easy to align with others in a row.

### PERFECT PAIRINGS

The Titan SP is designed for use with bifacial pv modules. With the integrated Typhoon module mounting rail which eliminates rear facing obstructions, bifacial pv modules are able to harness up to 20% more energy while installed on the Titan SP.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Titan SP 16P60</th>
<th>Titan SP 16P72</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Configuration</strong></td>
<td>16 x 60 Cell Solar Modules</td>
<td></td>
</tr>
<tr>
<td><strong>Module Mounting</strong></td>
<td>Typhoon Rail + Top Clamp</td>
<td></td>
</tr>
<tr>
<td><strong>Tilt Range</strong></td>
<td>5° to 82°</td>
<td></td>
</tr>
<tr>
<td><strong>Tilt Mechanism</strong></td>
<td>Manual or Actuator</td>
<td></td>
</tr>
<tr>
<td><strong>Max Wind Load</strong></td>
<td>150 km/h</td>
<td>135 km/h</td>
</tr>
<tr>
<td><strong>Max Snow Load</strong></td>
<td>50 psf</td>
<td>47 psf</td>
</tr>
<tr>
<td><strong>Post Installation</strong></td>
<td>Concrete embedded, Pile driven, Rock anchored</td>
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</tr>
<tr>
<td><strong>Material</strong></td>
<td>Galvanized steel, Aluminum</td>
<td>Stainless Steel, Zinc</td>
</tr>
<tr>
<td><strong>Hardware Material</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bonding Method</strong></td>
<td>Integrated</td>
<td></td>
</tr>
<tr>
<td><strong>Max Component Weight</strong></td>
<td>230lbs.</td>
<td></td>
</tr>
<tr>
<td><strong>Total Weight</strong></td>
<td>1400 lbs.</td>
<td>1700lbs.</td>
</tr>
</tbody>
</table>
CASE STUDY

Powering Agriculture with Bifacial Solar Panels

THE OBJECTIVE: MITIGATING THE COST OF POWERING AN IRRIGATION PUMP IN ALBERTA

G&C Farms at Bow Island in Alberta are located in one of the driest places in Canada. Frequent irrigation is needed - and the 125hp irrigation pump which supplies water to an irrigation pivot consumes significant power.

G&C Farms were searching for a means to future proof their business against rising electricity costs and to mitigate the T&D charges from the local utility provider. As Bow Island is also one of the sunniest places in Canada, Solar Optix Energy Services, an experienced team of professional pv installers, proposed a solution for installing a solar array to power the irrigation pump.

Solar Optix brought this challenge to Sentinel Solar, to provide a solution for future proofing the farm. To date, Solar Optix has installed 2MW of pv power and the team at Sentinel Solar was eager to partner with them on this exciting project.

THE SOLUTION: INSTALL A GROUND MOUNTED SOLAR ARRAY USING BIFACIAL SOLAR MODULES

Solar Optix designed and installed an array that consisted of 448 LG380W bi-facial solar modules, 4 SolarEdge 33.3 480V string inverters, 224 SolarEdge P800 optimizers and 28 Titan SP adjustable ground mounts using 16’ embedded, 8” helical piers.

The decision to use bi-facial solar modules was reached early on. Bi-facial solar cell technology collects energy from the front and back side of the module. In Alberta, where sunshine is plentiful year-round, using this technology allows the array to produce more power, while maintaining a smaller overall footprint on the agricultural land.

Solar Optix chose to use the Titan SP mounting solution because of it's ability to maximize power output from bi-facial solar modules. Newly developed by Sentinel Solar, the Titan SP is a single pole, adjustable tilt system capable of accommodating up to 16 solar modules, with either 60 or 72 cell configurations. It uses a shared rail mounting framework that decreases the clutter on the backside of the solar modules, greatly increasing the production output from bi-facial technology.
THE INSTALLATION: WORKING WITH THE TITAN SP

Solar Optix wanted a mounting system that could be easily installed, that would keep ground preparation costs down and that would be easy to align with multiple arrays in a row. Traditional ground mounted arrays use multiple footings that keep the framing rigid, with little to no adjustment for alignment.

The Titan SP single pole installation minimizes the upfront ground preparation costs and eliminates concerns over frost heaving in the winter months. Solar Optix was able to drill the mounting posts directly into the ground, eliminating the need for excavation and concrete footings. The ability to pivot the array structure on the post prior to tightening it together allowed for perfect alignment of the multiple arrays that were installed.

The Titan SP’s tilt angle is seasonally adjustable to ensure maximum performance for the sun’s angle - and to take advantage of the sun radiance off snow for the back side of the bifacial solar panels.

THE RESULTS: BIFACIAL SOLAR PANELS AND TITAN SP MOUNTING SOLUTION BRINGS NET ZERO TO G&C FARMS

The system was formulated to deliver 236Mwh annually, operating as a net zero system - completely offsetting their electricity costs to run the irrigation pump. The production data shows the bifacial solar panels combined with the Titan SP are on track to provide more power than a conventional system of the same size. In the winter months the system produced, on average, 58% more power than projected and by spring was tracking an average increase of 16%. The current projection for this system is to be 28% above standard system production estimates on an annual basis. Shine on G&C Farms!

Figure 4: Perfectly aligned Titan SP systems

![Accelerated Performance Chart](image)

Figure 5: Data illustrating bifacial gain

Figure 6: G&C Farms 170.2kW solar array
Sentry Mega

The Sentry Mega is a dual-axis solar tracking system. It uses astronomical control software to keep the array perpendicular to the sun's position from dawn to dusk. The system has been integrated with our Typhoon module mounting rail in order to support all standard 60 or 72-cell modules.

Features

The Sentry Mega is equipped with key features that offer maximum production from a dual-axis solar tracking array.

1. LOGIC CONTROL
   The Sentry Mega uses an astronomical tracking algorithm for pinpoint accuracy and maximum energy harvest.

2. FAIL-SAFE
   The Sentry Mega is equipped with several safety functions to protect the system from damage and to mitigate down-time.

3. REAL-TIME MONITORING
   Built in monitoring and control software allows the system’s operations to be viewed or changed remotely.

4. TYPHOON INTEGRATION
   The sharing design of the Typhoon module mounting rail supports all standard 60, or 72-cell pv modules.
**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Rotation</td>
<td>345°</td>
</tr>
<tr>
<td>Maximum Tilt</td>
<td>80°</td>
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<td>Maximum Wind Threshold</td>
<td>200 kph</td>
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<tr>
<td>Tracking Method</td>
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<tr>
<td>Internet Ready</td>
<td>Yes</td>
</tr>
<tr>
<td>Remote Control</td>
<td>Yes</td>
</tr>
<tr>
<td>Remote Monitoring</td>
<td>Yes</td>
</tr>
<tr>
<td>Limit Protection</td>
<td>Digital &amp; Mechanical</td>
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<tr>
<td>Wind Speed Detection</td>
<td>Anemometer</td>
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<tr>
<td>PV Bonding</td>
<td>WEEB DSKBD34</td>
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<tr>
<td>Weight</td>
<td>7000 lbs.</td>
</tr>
<tr>
<td>Total Weight with Modules</td>
<td>10000 lbs.</td>
</tr>
</tbody>
</table>

**TRACKING THE ADVANTAGE**

**SENTRY MEGA TRACKERS - 500 kW**

**FIXED ARRAY - 500 kW**

**TRACKING YOUR INVESTMENT**

With real-time monitoring included with the Sentry Mega, you get piece of mind knowing your system is always performing at it’s full potential.
Spyder

Spyder is a flush mount racking system for pitched rooftops. Designed for Canadian weather, the Spyder system is capable of withstanding up to 4 feet of snow, while balancing this load evenly across every truss through our unique staggered foot engineering.

Features

The Spyder system provides a suite of features making it the most versatile rooftop solar mounting solution.

**ADJUSTABLE HEIGHT**

1. The Spyder foot allows the rail height to be adjusted from 2 to 4 inches, which compensates for roof sag or unevenness.

**CUSTOM FLASHING**

2. The Spyder system uses a proprietary flashing design that mitigates water penetration into the roof.

**INTEGRATED BONDING**

3. The module clamps used on the Spyder system have built-in bonding that reduces overall balance of system costs.

**SPYDER RAIL**

4. The design of the Spyder rail allows for longer spans with staggered footing that maintains load balancing.
The Spyder system creates a beautiful array on any rooftop.

### PERFECT PAIRINGS

Solatrim™ safeguards and protects solar rooftop panels for your home, permanently. Not only is it strong and easy to install, it augments the lifespan and longevity of rooftop panels.
In-Roof System

Designed to change the aesthetics of a roof mounted solar array. A BIPV (building integrated photovoltaic) solar mounting solution allows the solar modules to sit flush with the roofing material, creating a seamless transition between the two.

Features

The In-Roof system delivers a beautiful aesthetic with key features that set it apart from other BIPV systems.

WEATHER PROOF

The integrated system is climate resistant (from -30°C to 100°C). It is also completely waterproof.

INSTALLATION FRIENDLY

Designed around professional installers, it takes roughly 6 hours to install a 2-5kW system.

COST-EFFECTIVE

The most cost efficient integrated pv system on the market. Ideal for new constructions and retrofits.

ENVIRONMENTALLY FRIENDLY

The mounting plates are made of 100% recyclable material and replace traditional shingles.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>SILVER, BLACK</td>
</tr>
<tr>
<td>Material</td>
<td>PP, ALUMINUM, STAINLESS</td>
</tr>
<tr>
<td>Temp Range</td>
<td>-30°C TO 100°C</td>
</tr>
<tr>
<td>Slope</td>
<td>12° TO 50° PITCH</td>
</tr>
<tr>
<td>Weight</td>
<td>2 TO 3 KG</td>
</tr>
<tr>
<td>Warranty</td>
<td>10 YEAR GUARANTEE</td>
</tr>
<tr>
<td>Resistance</td>
<td>WATER PROOF</td>
</tr>
<tr>
<td>Material Type</td>
<td>PP, ALUMINUM, STAINLESS</td>
</tr>
</tbody>
</table>

Supports **95%** of the PV modules on the market.
Mounting Systems

Typhoon Rail

The Typhoon module mounting rail consists of a robust, high-grade aluminum rail designed to withstand severe weather conditions. The design uses a sharing platform so that fewer rails are needed for any array size, rapidly increasing installation time.

COMPLETE INTEGRATION

All of our ground mount systems integrate the Typhoon module mounting rail. This provides rapid installation, endless configuration options and support for all standard 60, or 72-cell pv modules available.

CLAMPING OPTIONS

1. The rail can hold modules down via top or bottom clamping depending on the application.

VERSATILE

3. The rail can also be installed onto virtually any surface such as existing wood trusses or metal frame structures.

INSTALLATION FRIENDLY

2. Due to the design of the shared rail platform, fewer rails are required for multiple rows, speeding up installation.

UNIVERSAL

4. The rail can provide multiple module configurations and supports all standard 60, or 72-cell pv modules.
Ruby Rail

The Ruby module mounting rail consists of a compact, high-grade aluminum rail designed for mounting to metal roofs and metal, or wooden substructures. It's light-weight design reduces structural loading on existing structures.

**CLICLOC INTEGRATION**

1. The rail works with the clicloc module clamp which has integrated bonding that reduces balance of system costs.

**VERSATILE**

3. The rail can be installed onto a standing seam roof, a corrugated metal roof, or any metal framed substructure.

**INSTALLATION FRIENDLY**

2. The rail can be positioned along any axis, enabling multiple layouts and configurations for any sized array.

**COMPACT**

4. The light-weight design reduces loading on the installed surface, eliminating the need for additional structural support.