



Suntactics sTracker-1K Solar Tracking System

Owners Manual

Suntactics
1430 Koll Circle, suite 107
San Jose, CA
95112

Phone 408-316-4126



Contents

Introduction.....	- 3 -
SAFETY INSTRUCTIONS.....	- 4 -
.....	- 4 -
Suggested Tools	- 5 -
Hardware Identifier Parts.....	- 6 -
Solar Tracker Sub-Assemblies	- 7 -
Installing the Suntactics Solar Tracker.....	- 8 -
Tracker Post Installation with a Concrete Hole	- 8 -
Items supplied from owner for cement hole anchor method.....	- 8 -
Anchor the Post	- 11 -
North/South Pivot Bar Installation	- 11 -
.....	- 12 -
.....	- 12 -
East/West Pivot Bar Installation.....	- 13 -
Actuator Power Connect.....	- 14 -
Solar Panel Beam Assembly	- 15 -
Solar Panel Beam Installation.....	- 16 -
Solar Panel Rail Installation.....	- 17 -
Solar Panel Installation.....	- 18 -
Step 1.....	- 18 -
Step 2.....	- 19 -
Step 3.....	- 20 -
Micro Inverter installation	- 21 -
Install Tracking Sensor	- 22 -
Activating Tracking Control	- 22 -
Solar Tracker Electrical Diagram	- 23 -

Introduction

Thank you for purchasing the Suntactics solar tracking system. You will be pleased with the power output that a solar tracker can provide. Please read through all the instructions before attempting to install. There are many little items that should be completed in sequence.



SAFETY INSTRUCTIONS



FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE. Owners must insure there is adequate space and clearance for the solar tracker for safe operation and damage prevention.



WARNING

FAILURE TO FOLLOW THESE WARNINGS MAY RESULT IN SERIOUS INJURY AND/OR PROPERTY DAMAGE.

Owners must insure there is adequate clearance for the tracking device.

Do not climb on the tracker.

When adjusting post level, be aware of hand injury.

When installing the solar tracking structure, be aware of head injury.

Do not allow children to play around or adjust the solar tracking system.

Do not leave any obstructions near the solar tracker (i.e. a ladder)

When interconnecting to the grid, consult with a local code inspector or professional electrician.



SAFETY INSTRUCTIONS

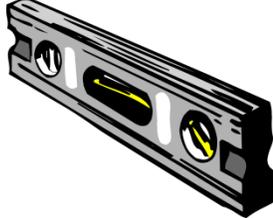


FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY, PROPERTY DAMAGE AND WILL VOID WARRANTY.

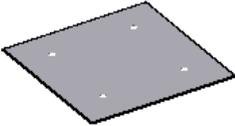
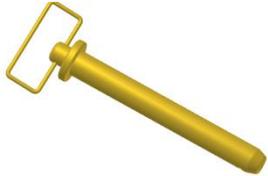
To ensure safety, do not attempt to assemble this system without following the instructions carefully. If in doubt, contact us immediately

- When using a ladder during assembly, use extreme caution.
- Two people are recommended for assembly when mounting solar panels.
- Before digging, contact your utility company to locate underground power cables, gas and water lines.
- Ensure there are no overhead lines within the area..
- Be aware of head injury during and after installation.
- When connecting to the grid, be cautious of electric shock from the service panel.
- If technical assistance is required, contact Suntactics directly
- Minimum ground clearance is 20'x 20 and 12' in height.
- Inverter output must connect to a 20 Amp breaker.

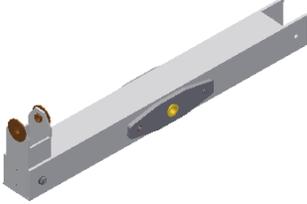
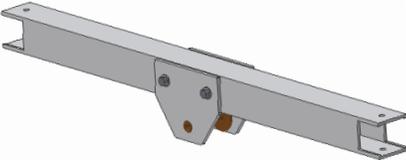
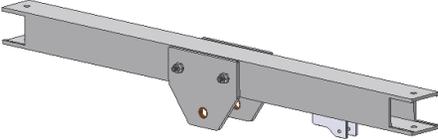
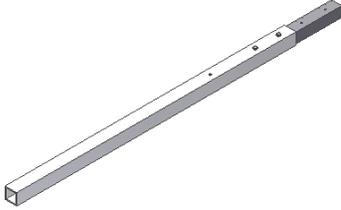
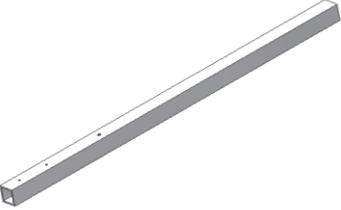
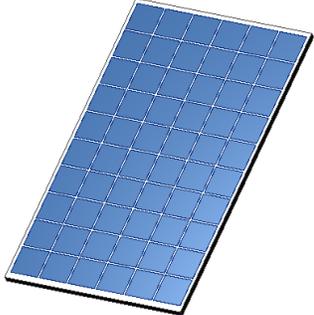
Suggested Tools

		
<p>Socket Assortment (7/16,1/2",9/16")</p>	<p>Wrench Assortment(7/16,1/2",9/16")</p>	<p>Screw Driver Assortment</p>
		
<p>Adjustable Jaw Wrench</p>	<p>Spring Clamp or Similar</p>	<p>Wire Stripper</p>
		
<p>Hand Saw</p>	<p>Hammer</p>	<p>Level</p>
		
<p>Ladder</p>	<p>Tape Measure</p>	<p>Wheel Barrow if hole mounting</p>
		
<p>Two saw horses (optional)</p>		

Hardware Identifier Parts

			
(A) Not used	(B) 1/4-20 x 2.5" bolt (4)	(C) 3/8-16 x 3" Bolt (4)	(D) 3/8-16 x 3.5" Bolt (1)
			
(E) 1/4-20 Nut (4)	(F) 3/8-16 Nut (5)	(H) 1/4-20 Washer (6)	(I) 3/8-16 Washer (8)
			
(L) Wood Template (1)	(M) Cotter Key	(N) Actuator pin (2)	(O) N/S hitch pin (1)
			
(P) E/W hitch Pin (2)	(Q) Lock Pin (3)	(R) Solar panel clamp (12)	(S) Panel stopper sleeve (8)
			
(T) Plastic rail cap RT (4)	(U) Plastic rail cap LFT (4)		

Solar Tracker Sub-Assemblies

		
<p>1 Main Post (1)</p>	<p>2 Axis 2 Pivot beam (1)</p>	<p>3 Axis 1 Actuator brace (1)</p>
		
<p>4 Axis 1 pivot beam (1)</p>	<p>5 Axis 1 pivot beam with Actuator bracket (1)</p>	<p>6 Solar Beam part A (2)</p>
		
<p>7 Solar Beam part B (2)</p>	<p>8 Solar Panel Railing (4)</p>	<p>9 Solar Panel (4)</p>
		
<p>10 NEP Inverter (2)</p>	<p>11 Tracking sensor (1)</p>	

Installing the Suntactics Solar Tracker

Before you begin, please read through all the instructions. Doing so will help you as you proceed through the next steps. The structure of the solar tracker is very rugged and will provide many years of service. But the most important part of the installation is anchoring the vertical post. There are a few ways you can do this. One way is to build the pier with a hole. This method works well in mild climates and up to 50 MPH wind conditions. For more extreme conditions an approved engineering specification is included. This consists of placing a 6'x 6' pad and is rated to much higher wind conditions, snow load and seismic tolerances.

With all projects like this, you may want to check with your local permitting department before proceeding. Regardless, constructing a pier that consists of a 3-4 foot deep hole filled in cement, rebar, and l-bolts works well and the tracker should handle wind gust up to 50 MPH.

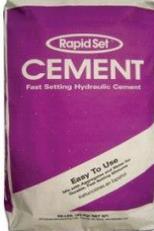
Tracker Post Installation with a Concrete Hole

WARNING

Before digging hole for anchor system, check for buried power, gas, water, and telecommunication lines! Failure to do so could result in serious or fatal injury! Contact your local utility company if unsure.

Items supplied from owner for cement hole anchor method

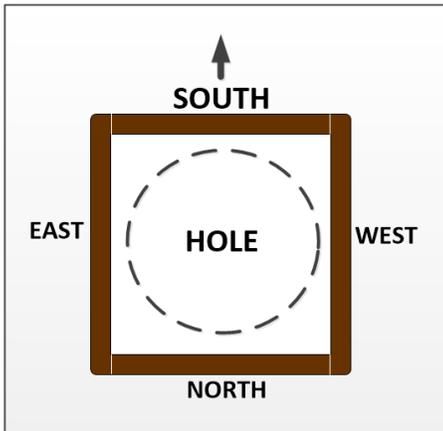
These items are easily acquired from your local hardware store.

3 foot (1/2") Rebar	11- 60lb bags of cement	Post Hole Digger
		
		
12" – 14", 5/8" L-bolt (4)	5/8-11 Nut (12)	5/8-11 Washer (12)

Before you mount the post, make absolutely sure that you have a clearance of 15' x 15' for the solar tracker. And most importantly, place the tracker in an area with no shadows from trees and buildings from sun up to sun down. The solar tracker will produce full power if it can see sun from dawn to dusk conditions.

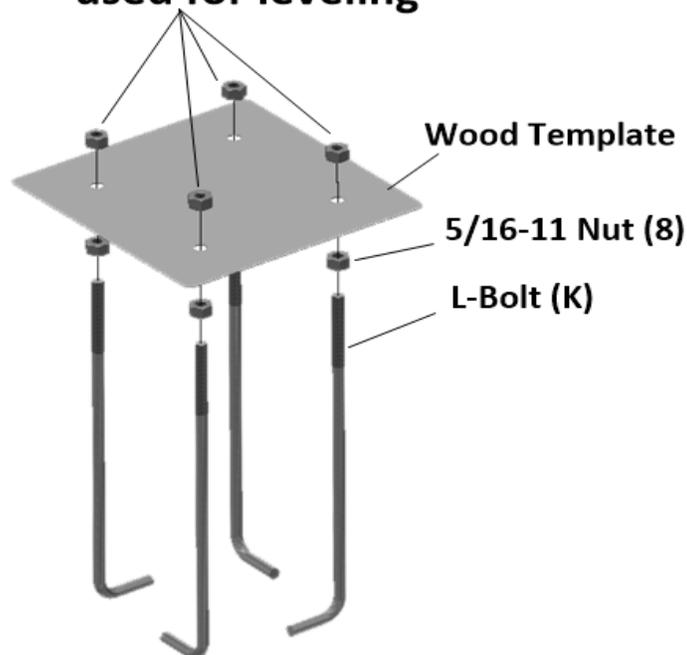
If you are a handyman, installing the post anchor should be a relatively easy task. Once you read through the instructions, you should be able to see what we are trying to accomplish here. **Please read through the instructions first!**

- 1) Build a 20" x 20" (inside dimension) square form with 2 x 4's and nails or screws.
- 2) Dig a hole 3-4' deep and 18" in diameter, Place the frame on the surface. **Use a compass and aim one edge to the South direction.** Stake the frame into the ground.
- 3) Level the frame and use a saw to cut stakes flush with the frame top edge.



- 4) Prepare the wood template(L) assembly with 4 L-Bolts and 8, 5/16-11 Nuts.

These nuts will be used for leveling



- 5) Prepare cement mix in wheel barrow. It will take a few loads. Fill hole with cement and stop about 12" short from the surface. Insert four ½ ' x 2-3 feet in length rebar rods (#40) into cement. Space 8-10" apart.



- 6) Fill the hole to the top. Level off the cement with a scrap piece of wood using the frame top edge as a guide.



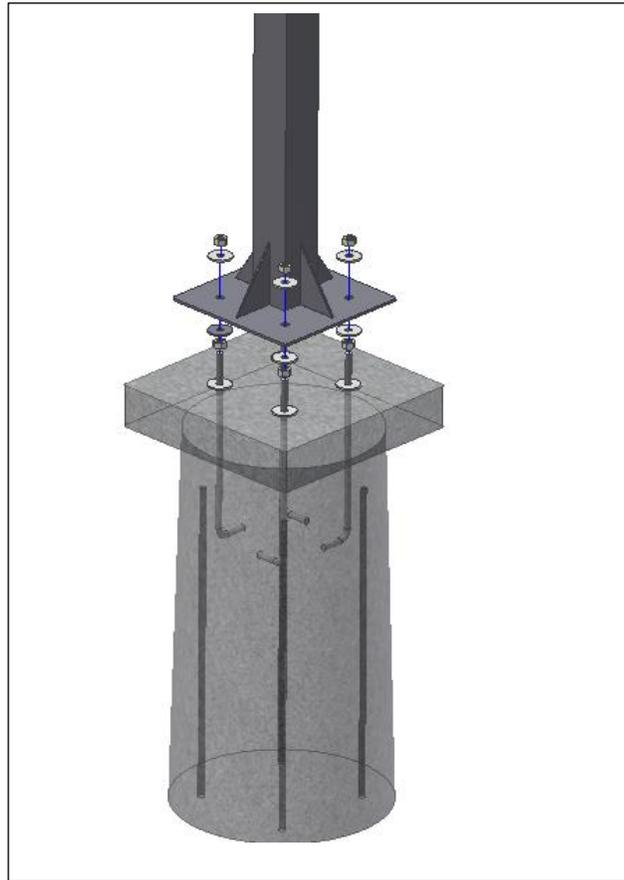
- 7) Use the template assembly in step 4 and push it into the cement all the way down to mate with the surface. The bottom 4 nuts will be forever embedded in the cement.



Do final cleanup and let set for 3-4 days.

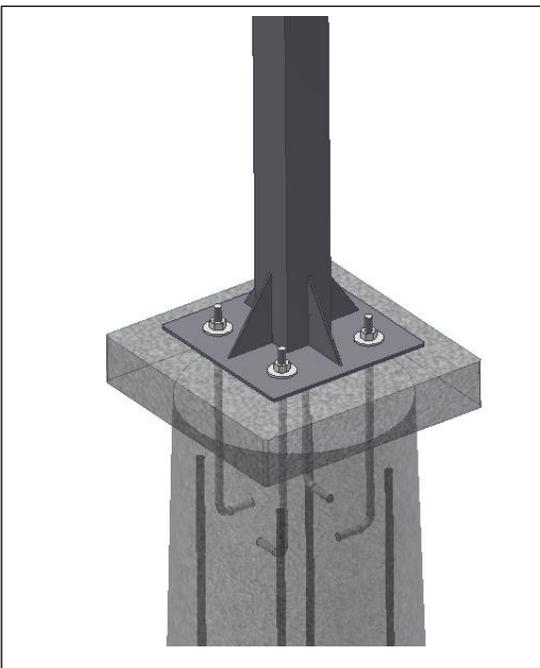
Anchor the Post

- 1) Remove top nuts from template and remove top template and discard.
- 2) Place 4 washers (J), Install 4 Nuts (G) to L-Bolts and place 4 washers (J) on top of the nuts.



3) Place post onto the bolts. Make sure the south indicator on the post is facing south. ***The actuator on the post also faces south. Refer to next section for a rendition.***

Place 4 washers (J), and 4 nuts(G) to post mounting plate. Adjust bottom and top nuts to level post.

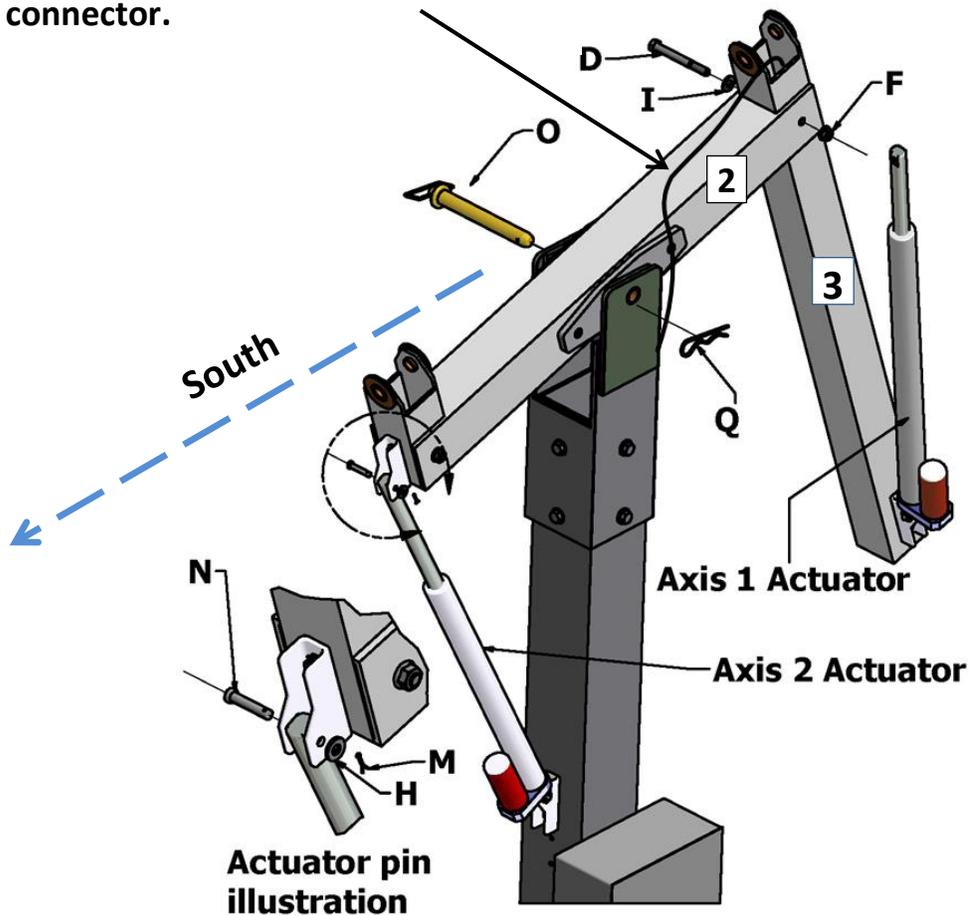


North/South Pivot Bar Installation

							
D - (1)	I - (1)	F - (1)	H - (1)	M - (1)	(N) - (2)	Q - (1)	O - (1)

Place pivot beam "2" on post and insert a hitch pin "O". Attach "Axis 2 Actuator" to pivot beam "2" using washer and cotter key. Install actuator brace "3" to pivot beam "2".

Axis 1 power cable runs through post. Pull it out the hole below box, then into box and plug into E/W connector.

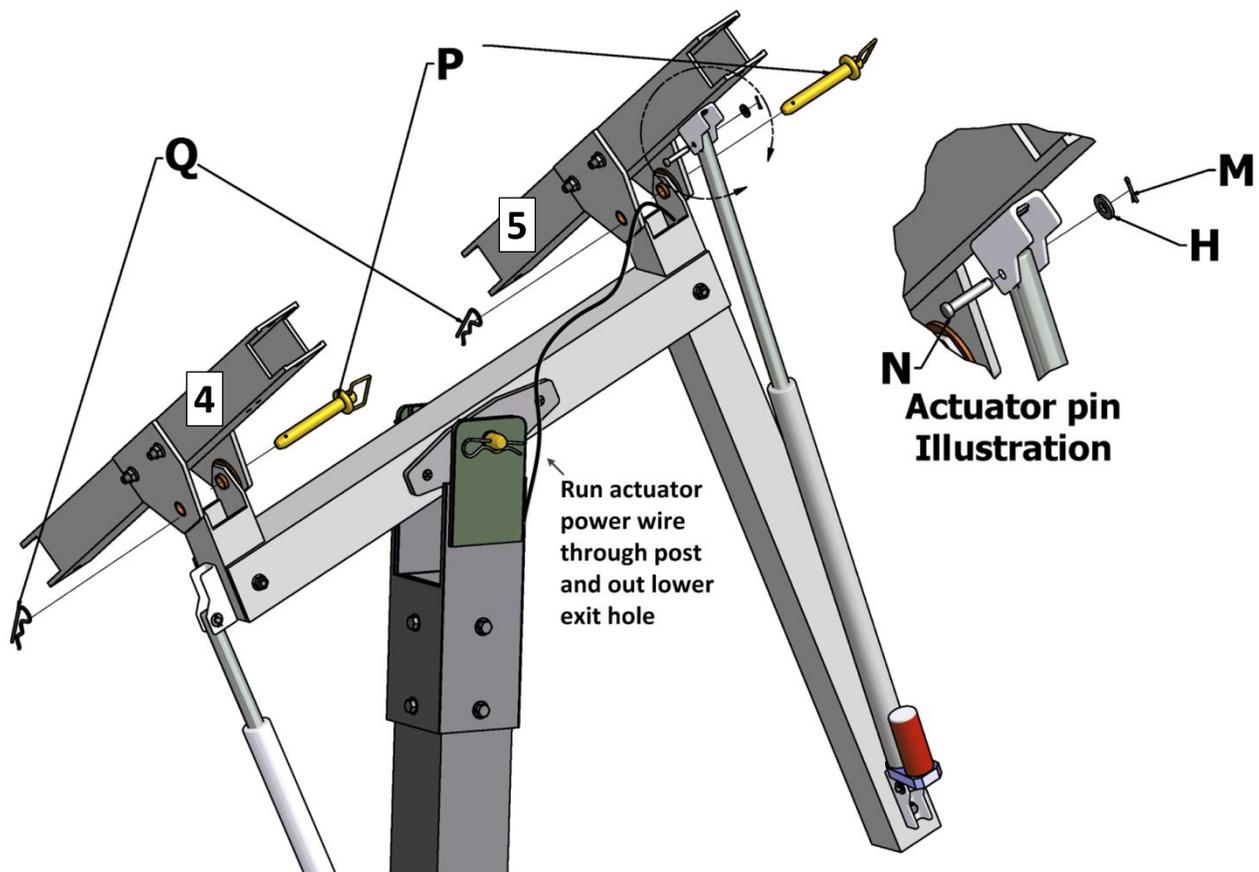


East/West Pivot Bar Installation

				
(N) - (2)	H - (1)	M - (1)	P - (2)	Q - (1)

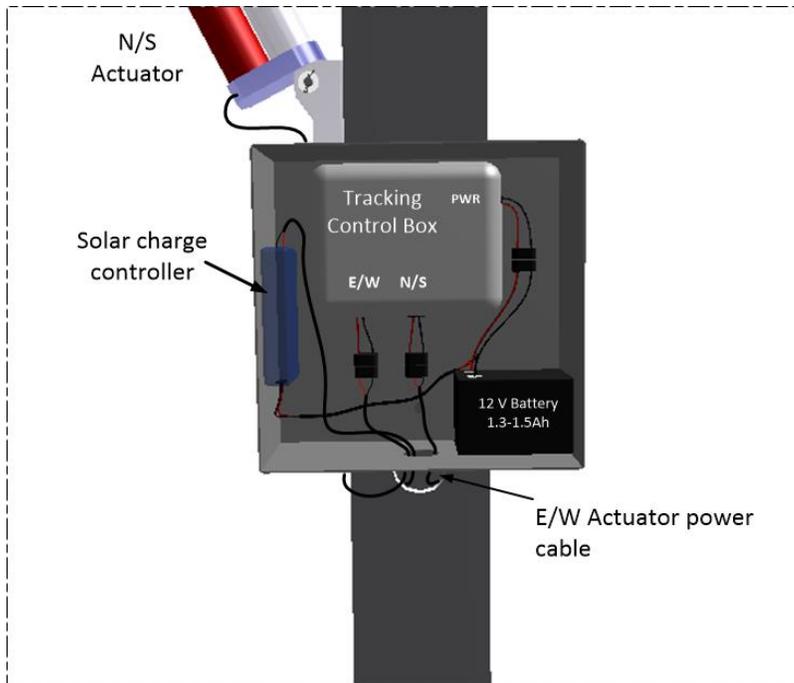
This step requires pivot bars 4 and 5. Cut tie-wraps holding the large thrust washers. Slide pivot bar plates over thrust washers until holes match. Add some grease to the hitch pins before installing. Snap clip to pins.

Using a stiff wire (coat hanger type wire, et) pull the actuator power wire through the post and out the large hole mid post exit hole.



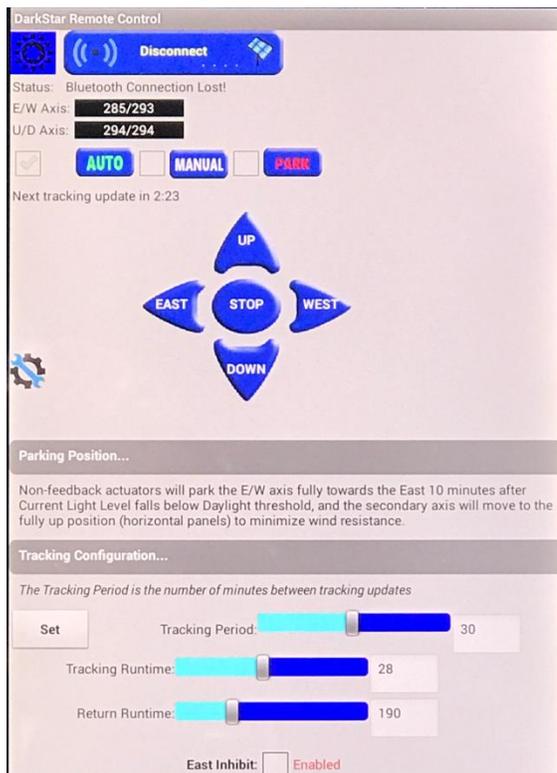
Actuator Power Connect

Being able to move the actuators are necessary for upcoming installation procedures. This section shows how to activate and control the actuators and move them as necessary to aid in installing other parts.



Remove the lid on electrical box. Run E/W cable through the hole and plug it into E/W connector on tracking control box.

Solar tracker app

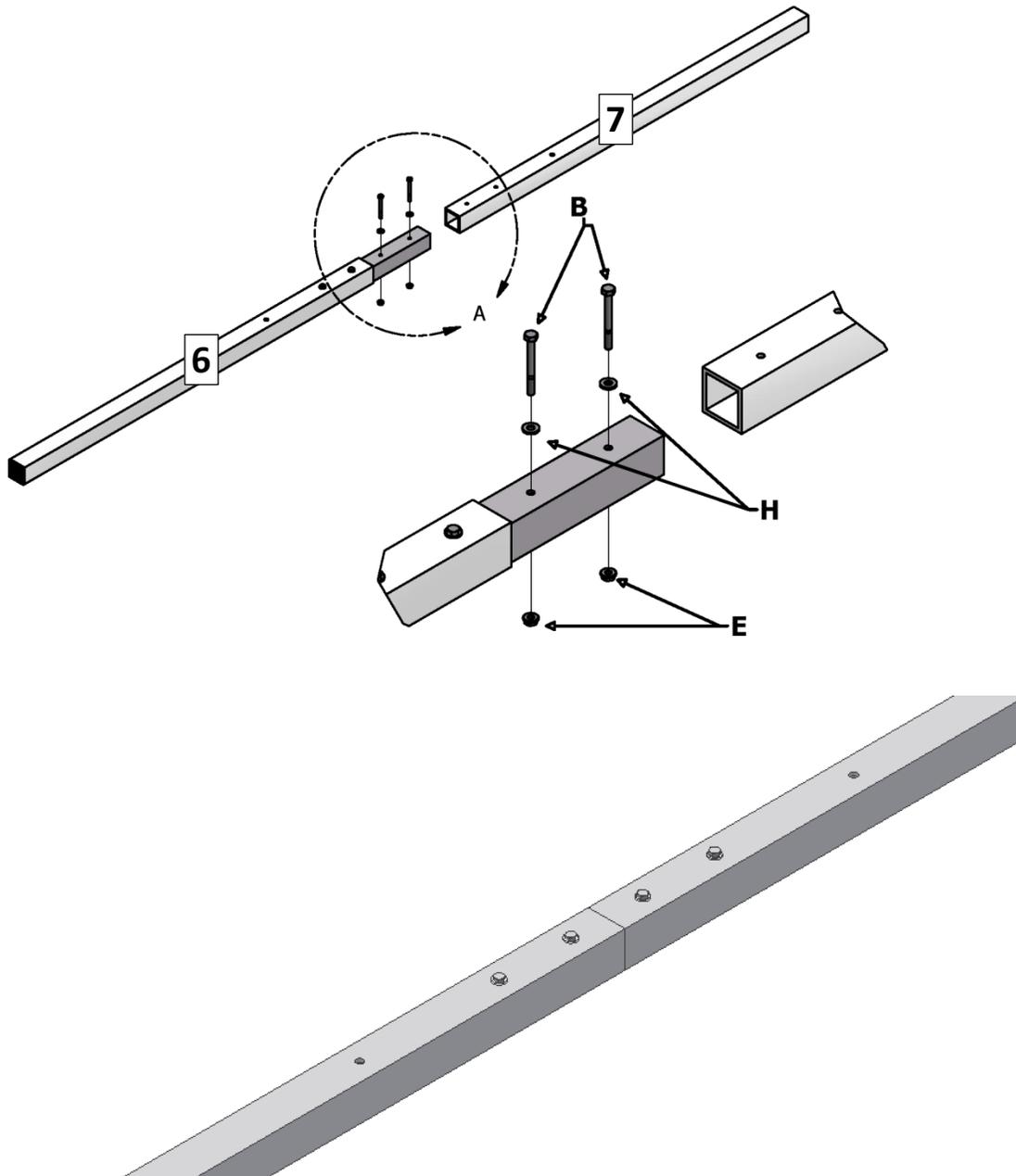


1. Connect the power plug from the battery to the controller
2. Power up the tablet and start the Darkstar app.
3. The LEDs on the controller will light up and the actuator motors will do a short run.
4. LEDs will be blinking on Bluetooth circuit board.
5. Push the Connect button on top of the App. When it connects, the LEDs will stop blinking. You are connected.
6. Click the Manual button and wait a couple seconds
7. By using the Nav buttons, you should be able to move the actuators.

Solar Panel Beam Assembly

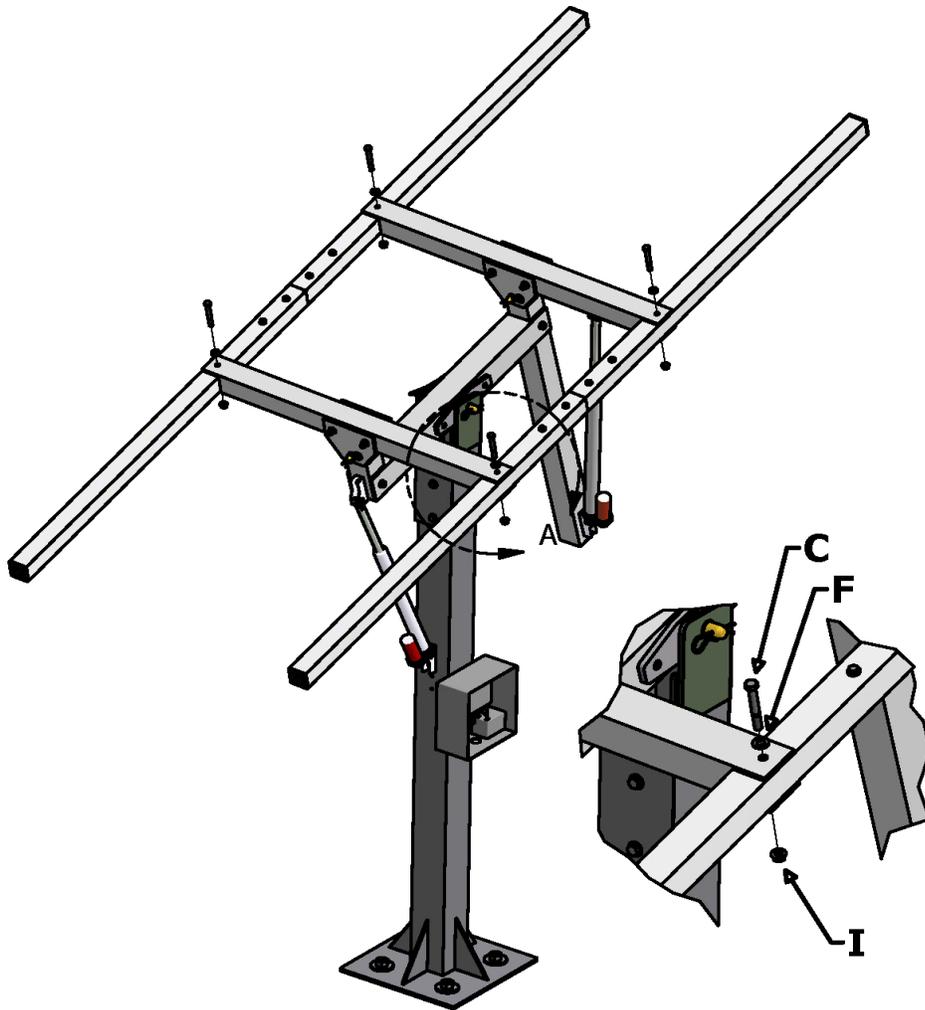
		
B - (4)	H - (4)	E - (4)

Assemble two panel beams:



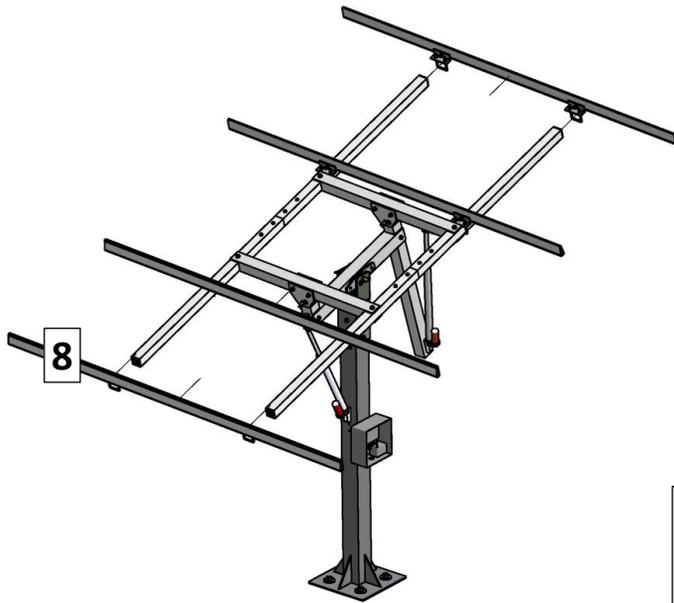
Solar Panel Beam Installation

		
C - (4)	F - (4)	I - (4)



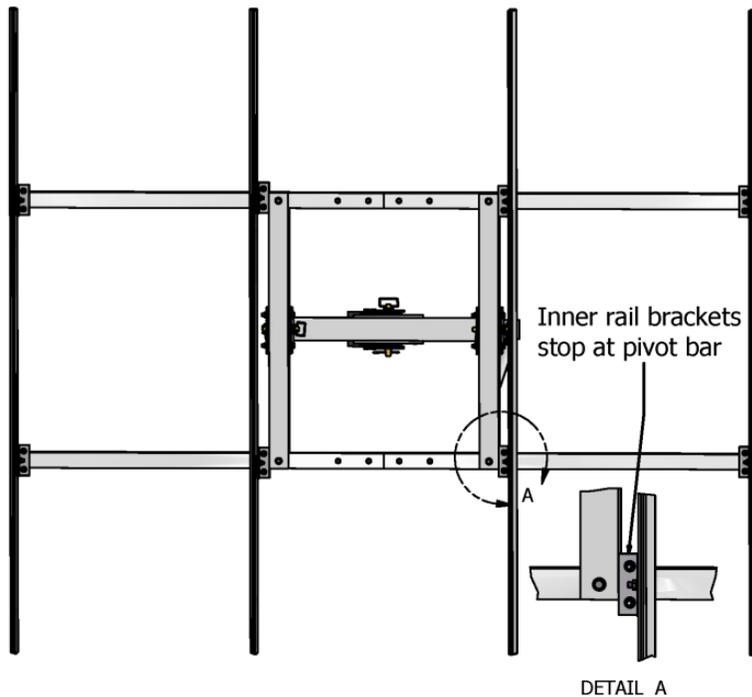
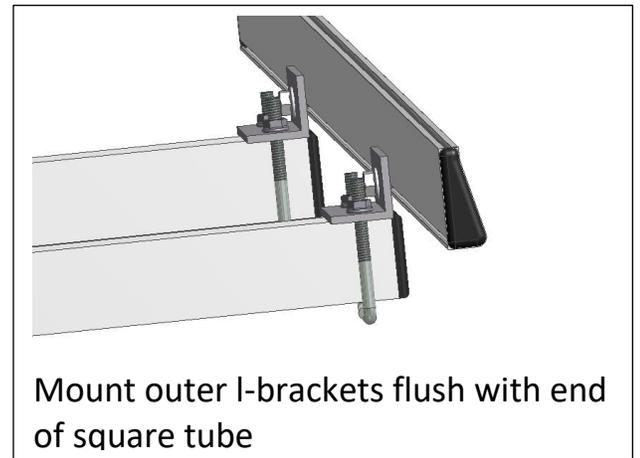
Solar Panel Rail Installation

Use 4 solar panel rails (item 8)

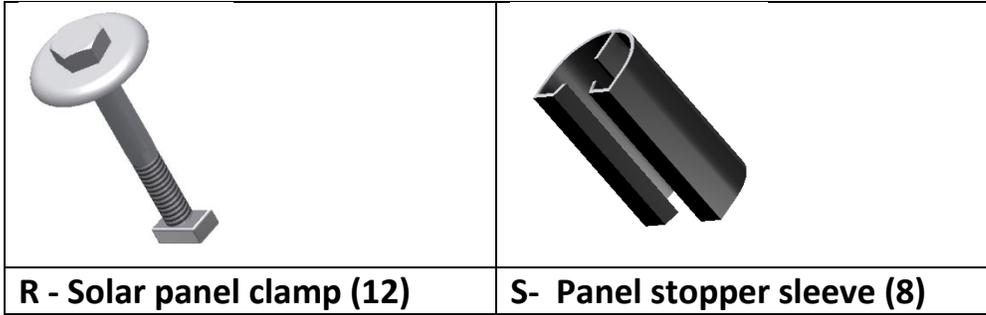


Slide panel rail Square-bolts onto panel beams. Loosen bolts on one side of the rails as needed to fit.

Note: The upper two rails mount the opposite direction of the bottom two rails.



Solar Panel Installation

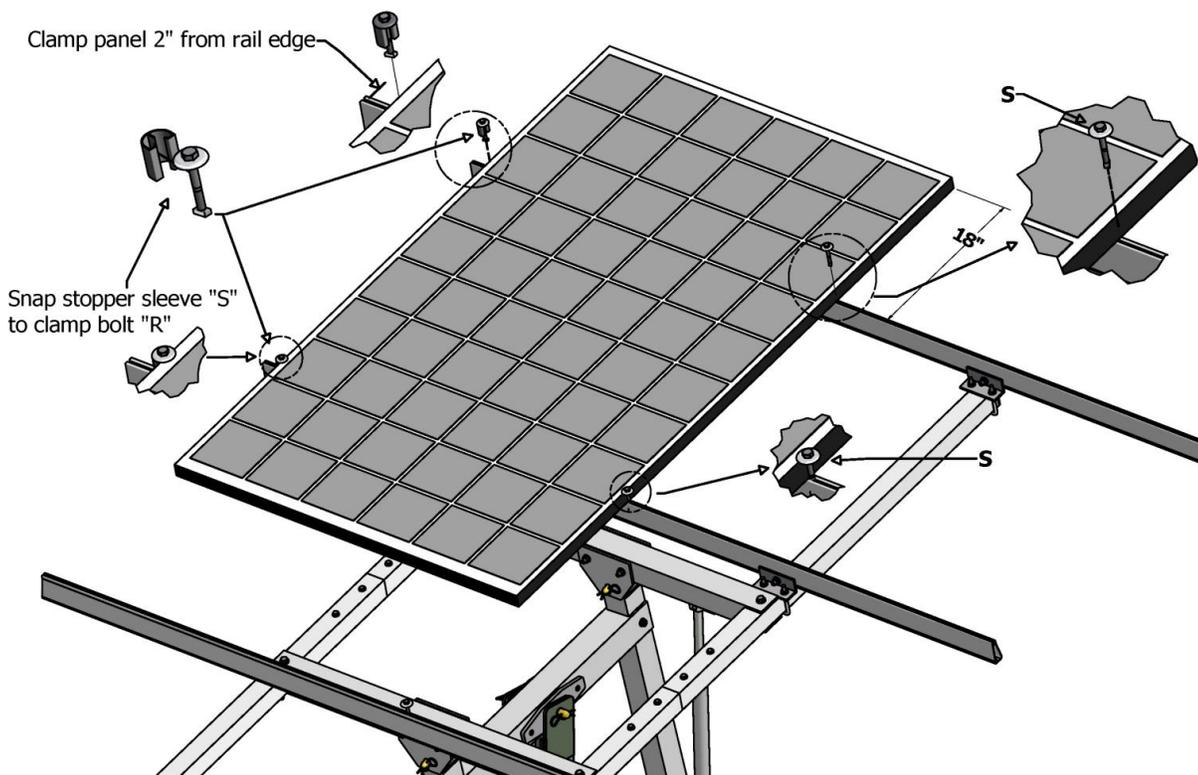


Use 4 solar panels (item 9). Two people are required to lift the panels onto the rails. Adjust the tracking structure to a convenient position to mount the panels. **Important! Orient all four panel power boxes to center so their wires can reach the inverters.**

Step 1

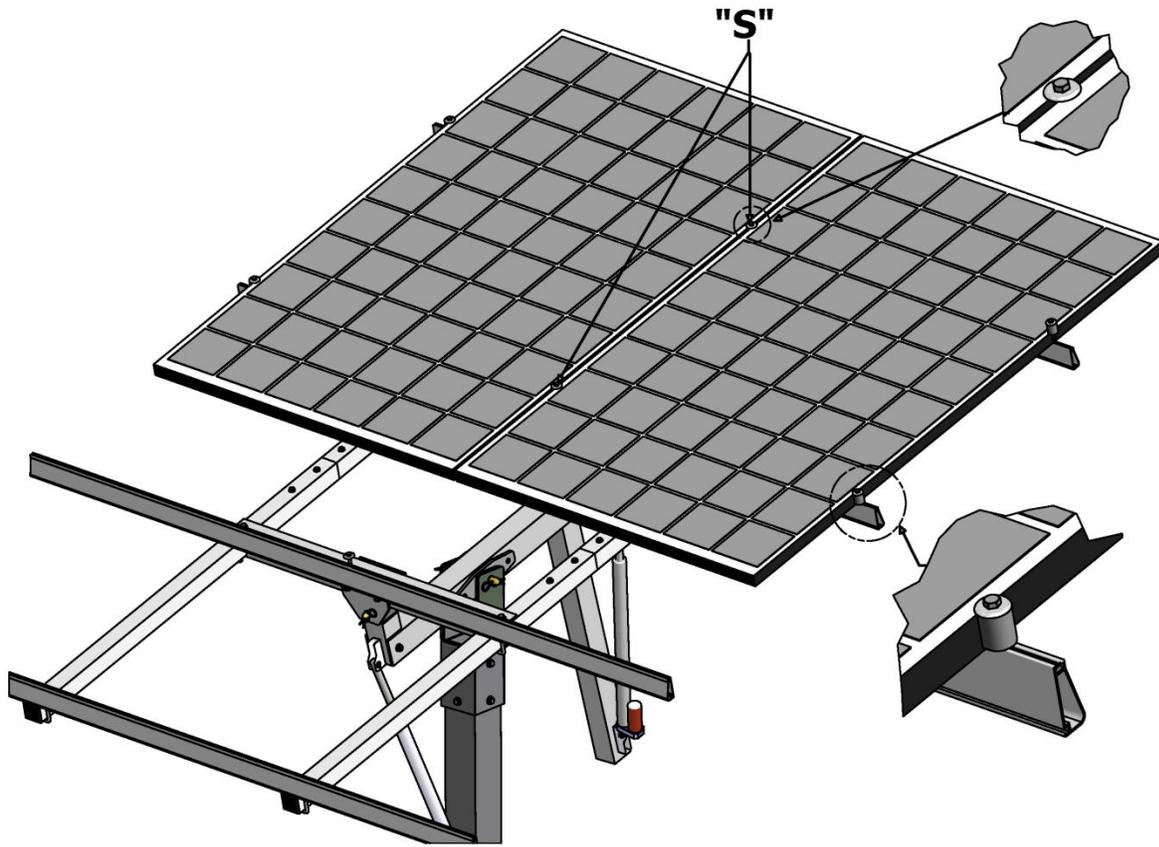
The solar panel clamp bolt end drops into the rail track. When tightened, they clamp down into the track. Solar panel clamp (R) is the main fastener with the addition of the panel stopper sleeve (S) that is used for edge clamping.

Place panel into position (2" from rail edge and "18 from rail top edge). Tighten edge clamp bolts to a reasonable feeling. There is no torque wrench specs involved here. The clamps bolts need to be tight enough to hold the panel in place without the mid clamps. Keep mid clamps (S) loose for step 2.

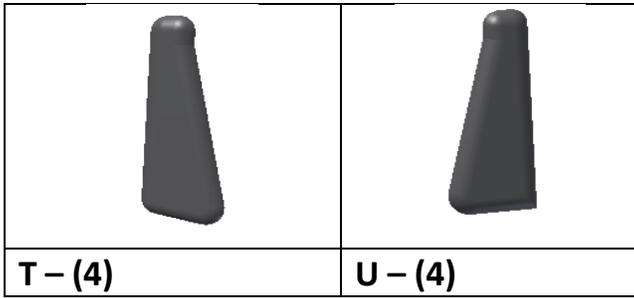


Step 2

Place the second panel against the two mid clamps. Align the second panel then tighten the mid clamp bolts securely. Install the edge clamps and tighten. The two Northern panels are now installed.

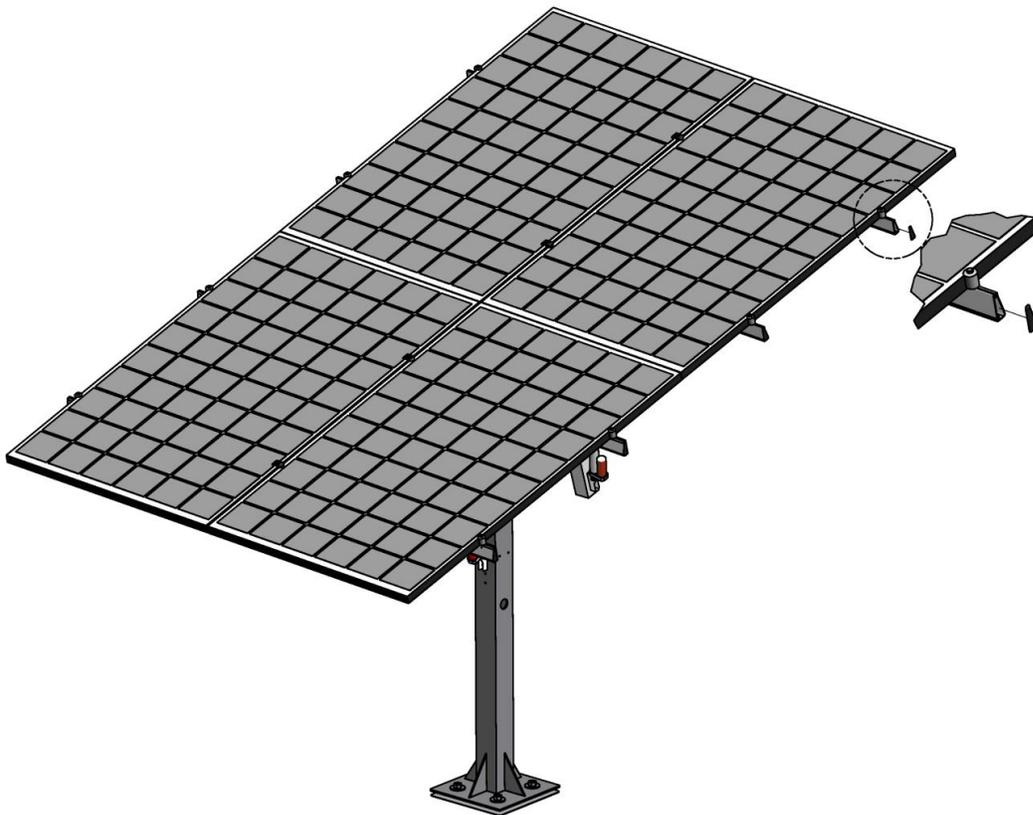


Step 3



Mounting the final two panels is similar to steps 1 and 2. Use spring clamps to hold the solar panel backside frames to the upper (North facing panels) then clamp down the solar clamps. Once all panels are in place check all clamp bolts for snugness. Install the 8 plastic end caps. The solar tracker main assembly is now in place.

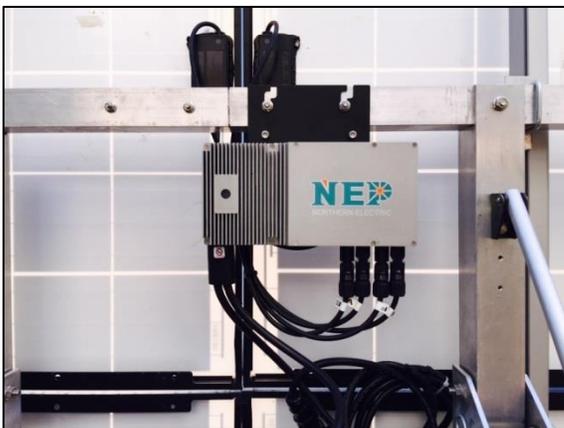
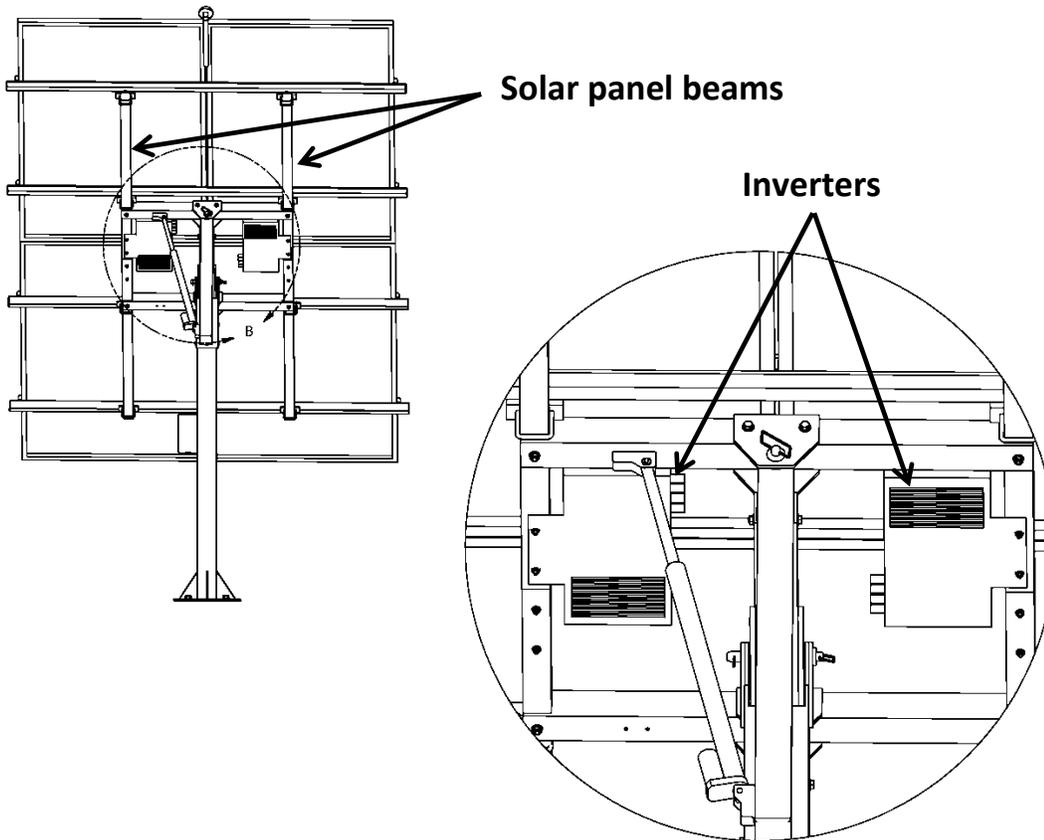
The upper left panel is also used to charge the electronics. There are two y-connector harnesses that aid in this connection. Plug two y-connectors to inverter, then plug panel output to y-connectors. Refer to electrical diagram.



Micro Inverter installation

We are providing you the best of the best when it comes to micro inverters. There are two inverters that will need to be mounted to the structure. Both inverters have the power cables attached. You will plug these into each other on the next step.

The inverters (item 10) mount to the solar panel beams. Loosen the two upper nuts on each beam and slide the inverter slots on the inverter plate to the bolts on the beam. Tighten the nuts.



This is ultimately what it will look like after everything is hooked up. Refer to the wiring diagram included in this manual. Use tie wraps to snug all cables.

Install Tracking Sensor

Tracking sensor (item 11) tie wraps into the solar panel frame holes with 2 tie wraps. Tie wraps loop through holes and across panel frame surface under sensor post, then around top of sensor post. Once installed, run sensor wire along panel framing then into post and out the post side hole. Run the wire into the box and plug the RJ45 connector into the coupler.

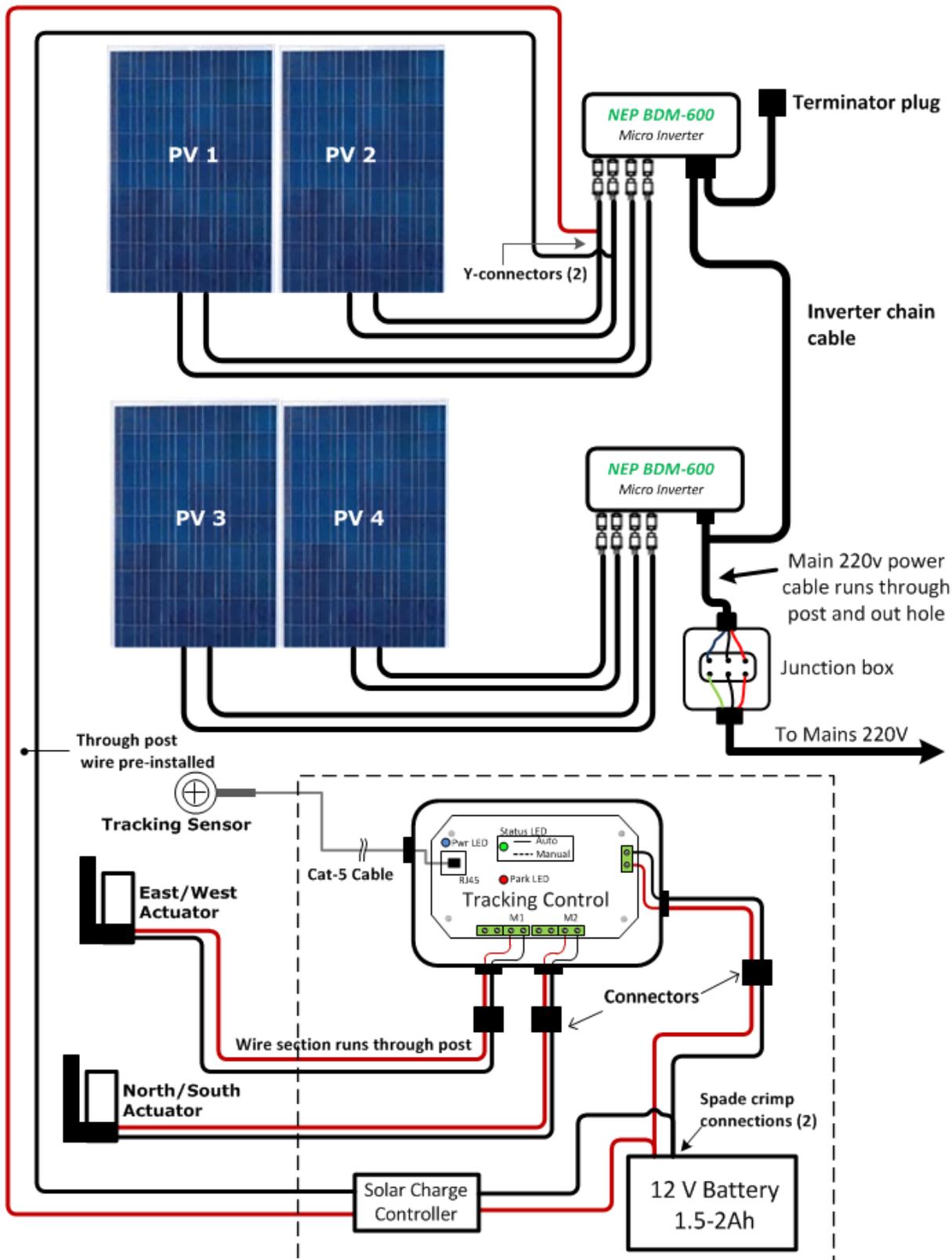


Activating Tracking Control

Using the control app, connect to the tracker control as with previous instructed. If the blue tooth board is not blinking on the controller board, reset the power plug. Once the app is up and running, click “Auto”. The solar tracker should start its movement towards the sun.

Solar Tracker Electrical Diagram

Refer to this diagram for all electrical connections. Also note the terminator plug on the top inverter (included in kit hardware. The red and black wires 220v hot and plug into a 220 breaker. The other wire (either blue or yellow/green) is ground.



Solar tracker electrical diagram. Suntactics copyright all rights reserved 2017