



SUNTURA SOLAR TRACKER ELECTRONICS

SKU: SOT-TRKS-EL

User's Manual

Table of Contents

1 Introduction 4
1.1 Limited Warranty 4
1.2 Restrictions 4
1.3 Warranty Claims & Return Procedures 4
1.4 Disclaimer 5
1.5 Limitation of Liability 5
2 Product Overview 6
2.1 Features 6
2.2 Safety Precautions 6
3 Installation 6
3.1 Parts List 6
3.2 General Installation Guidelines 6
3.2.1 Electronics Box Installation 7
3.2.2 North/South Linear Actuator/Motor Installation 8
3.2.3 East/West Linear Actuator/Motor Installation 8
3.2.4 Photo Sensor Installation 8
3.3 Fine Tuning the LED's for Optimal Solar Tracking 9
4 Troubleshooting And Support 11
4.1 Care 11
4.2 Troubleshooting 11
4.3 Support 11

1 INTRODUCTION

Windy Nation Inc. (“Windy Nation”) is not assembling the Solar Tracker, or any other product offered by Windy Nation. Windy Nation, and its directors, officers, and employees disclaim, and by purchasing a Windy Nation product you accept all liability and responsibility for damage to property, injury, or death arising out of or related to the use or misuse of any product offered by Windy Nation.

1.1 LIMITED WARRANTY

Windy Nation warrants that the Solar Tracker (the “Product”), will be free from manufacturing defects in materials and workmanship under normal authorized use consistent with product instructions for a period of one (1) year from the date the original purchaser (“Customer”) receives the Product (the “Warranty Period”). This warranty extends only to the original purchaser. The Customer’s sole and exclusive remedy and the entire liability of Windy Nation, its suppliers and affiliates for breach of the warranty is, at Windy Nation’s option, either (i) to replace the Product (or defective component part(s)) with a new or reconditioned Product (or component part(s)); (ii) to repair the reported problem; or (iii) to refund the purchase price of the Product. Repaired or replaced products are warranted for the remainder of the original warranty period only. No employee, agent, dealer or other person is authorized to give any warranties on behalf of Windy Nation not expressly set forth in this limited warranty.

1.2 RESTRICTIONS

No warranty will apply if the Product (i) has been altered or modified except by Windy Nation; (ii) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Windy Nation; (iii) has been subjected to abnormal physical, thermal or electrical stress, misuse, negligence, or accident. If Windy Nation determines that the problem with the Product is not due to a manufacturing defect in Windy Nation’s workmanship or materials, or otherwise does not qualify for warranty repair, then the Customer will be responsible for the costs of all necessary repairs and expenses incurred by Windy Nation.

1.3 WARRANTY CLAIMS & RETURN PROCEDURES

To be eligible for service under this warranty, the Customer must submit a service request within the Warranty Period by contacting Windy Nation in writing or via telephone and obtaining a Returned Materials Authorization (“RMA”) number. This RMA must be obtained before returning any product under this warranty. Notification must include a description of the alleged defect, the manner in which the Product was used, the serial number, and the original purchase date in addition to the name, address, and telephone number of the Customer. Within five (5) business days of the date of notification, Windy Nation will provide the Customer with an RMA number and the location to which the Customer must return the defective Product. Any Product returned for warranty service shall be shipped at the expense and risk of the Customer. The Customer must return the entire Product kit (or, if authorized by Windy Nation, the defective component parts), within fifteen (15) days after issuance of the RMA number. Windy Nation will be under no obligation to accept any returned Product that does not have a valid RMA number. Customer’s failure to return the Product within fifteen (15) days of its receipt of an RMA number may result in cancellation of the RMA. All parts that Windy Nation

replaces shall become Windy Nation's property on the date Windy Nation ships the repaired Product or part back to the Customer. Windy Nation will use all reasonable efforts within thirty (30) days of receipt of the defective Product to repair or replace such Product. If a warranty claim is invalid for any reason, the Customer will be charged at Windy Nation's then-current rates for services performed and will be charged for all necessary repairs and expense incurred by Windy Nation. If Windy Nation determines that a warranty claim is valid, it will ship the repaired or replaced Product to Customer at Windy Nation's cost.

1.4 DISCLAIMER

EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH IN THE PREVIOUS PARAGRAPH, WINDY NATION DISCLAIMS ALL WARRANTIES, EXPRESS, IMPLIED AND STATUTORY INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ANY PRODUCTS PROVIDED BY WINDY NATION. NO ORAL OR WRITTEN INFORMATION OR ADVICE GIVEN BY WINDY NATION, ITS DEALERS, DISTRIBUTORS, AGENTS OR EMPLOYEES SHALL IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY. WINDY NATION DOES NOT WARRANT THAT THE QUALITY OR PERFORMANCE OF THE PRODUCTS WILL MEET YOUR REQUIREMENTS OR THAT YOU WILL BE ABLE TO ACHIEVE ANY PARTICULAR RESULTS FROM USE OR MODIFICATION OF THE PRODUCTS. Some jurisdictions do not allow the limitation or exclusion of implied warranties or how long an implied warranty may last, so the above limitations may not apply to you. In any such jurisdiction, the warranty shall be limited to the minimum warranty and period required by law.

WINDY NATION EXPRESSLY DISCLAIMS ALL LIABILITY FOR BODILY INJURIES OR DEATH THAT MAY OCCUR, DIRECTLY OR INDIRECTLY, BY USE OF THE PRODUCT BY ANY PERSON.

1.5 LIMITATION OF LIABILITY

UNDER NO CIRCUMSTANCES WILL WINDY NATION OR ITS AFFILIATES OR SUPPLIERS BE LIABLE OR RESPONSIBLE FOR ANY LOSS OF USE, INTERRUPTION OF BUSINESS, LOST PROFITS, LOST DATA, OR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, EVEN IF WINDY NATION OR ITS AFFILIATE OR SUPPLIER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so these limitations may not apply to you. Neither Windy Nation nor its affiliates or suppliers will be held liable or responsible for any damage or loss to any items or products connected to, powered by or otherwise attached to the Product. The total cumulative liability to Customer, from all causes of action and all theories of liability, will be limited to and will not exceed the purchase price of the Product paid by Customer. This warranty gives the Customer specific legal rights and the Customer may also have other legal rights that vary from state to state.

2 PRODUCT OVERVIEW

Building a complete solar tracking system has never been easier. The SunTura Solar Tracker Kit can be used directly on 12 volt or 24 volt systems. If you plan on using the SunTura Solar Tracker Kit on a grid tie system, we can supply you with a 12 volt power supply which can be plugged into the grid (110 AC or 220 AC).

2.1 FEATURES

- 100% pre-wired SunTura Solar Tracking Electronics
- Dual axis tracker provides up to 40% more power production than fixed solar panels.
- Electronics are designed to handle 14 amps at continuous duty
- All electronics are water-tight with IP65 rated enclosures

2.2 SAFETY PRECAUTIONS

CAUTION: Never approach a solar tracker while the SunTura Solar Tracker electronics are “on”. The solar tracker can move unexpectedly and the powerful linear actuators/motors can cause serious injury or death. Always disconnect the SunTura Solar Tracker electronics from its power supply before approaching the solar tracker.

3 INSTALLATION

3.1 PARTS LIST

1. Electronic Controller Box
2. Photo Sensor Dome
3. Cable for connections to Motors and Power Supply

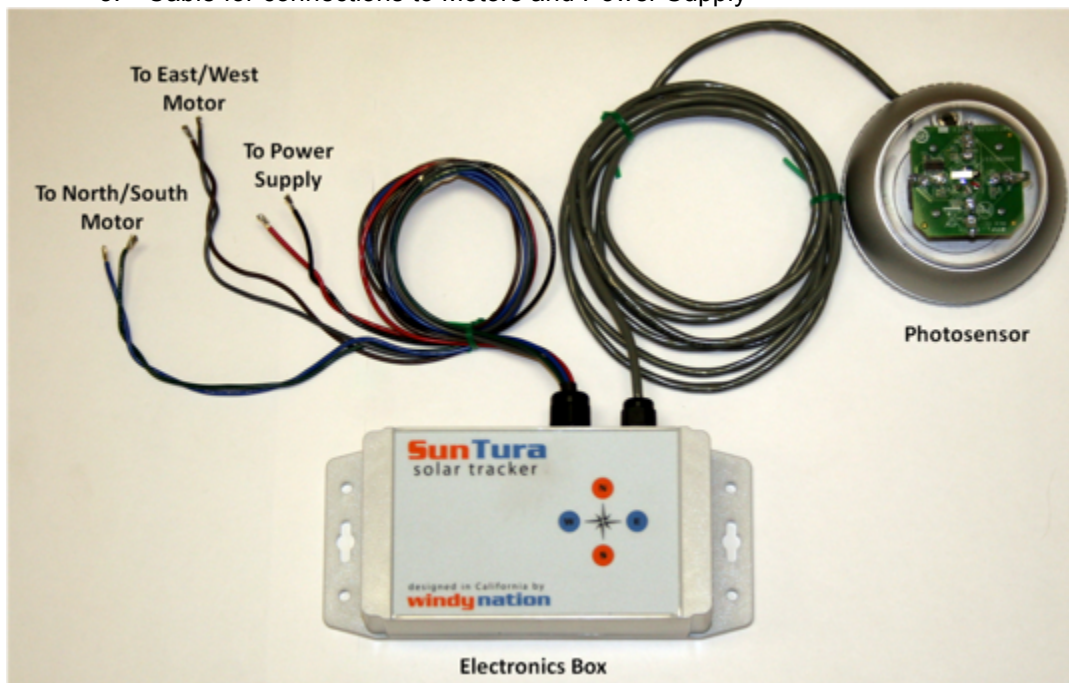


Figure 1: SunTura Solar Tracker Electronics Parts List

3.2 GENERAL INSTALLATION GUIDELINES

The SunTura Solar Tracker Electronics provides the electronics used to build a dual axis solar tracker (One can also choose to use the electronics to build a single axis tracker by simply not using one of the motor ports). The SunTura Solar Tracker Electronics are capable of operating at 14 amps continuously and 16 amps intermittently. In general, solar trackers use linear actuators (geared motors) to move and follow the sun. The 14 amp operational capacity of the SunTura Solar Tracker Electronics is powerful enough to power linear actuators for solar trackers up to 2.5 kW (2500 Watts). Check the amp draw of the linear actuators or

geared motors that are going to be connected to the SunTura Solar Tracker Electronics and make sure each motor used does not exceed the 14 amp limit.

3.2.1 Electronics Box Installation

The Electronic Box has a 20 amp fuse on the circuit board located on its inside. There is also one additional spare fuse. The fuse protects the SunTura Solar Tracker Electronics from a short circuit. If you accidentally short circuit the electronics, simply replace the blown fuse with the spare fuse. Do NOT bypass the fuse. Additionally, there are four buttons on the top of the Electronics Box which allow one to manually move the linear actuators in the north, south, east and west directions. See Figure 2 below.

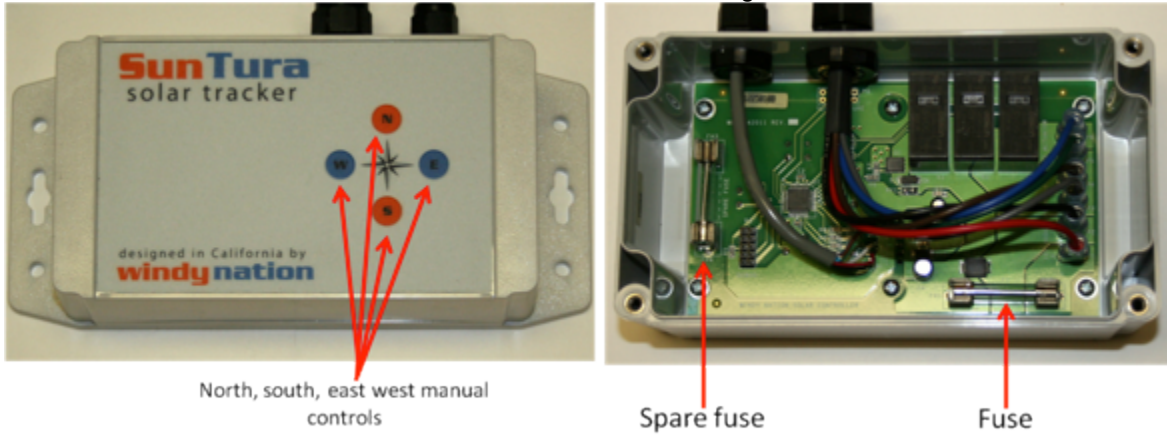


Figure 2: Electronics Box manual controls and fuse locations.

WARNING: Do NOT connect the SunTura Solar Tracker Electronics to the power supply until you have completely finished the installation process and all people are safely away from the solar tracker's range of motion!

The red and black wires coming out of the Electronics Box are the power supply wires. These wires need to be connected to a 12 or 24 volt DC power supply. Some good examples of power supplies are a 12 volt battery, a 24 volt battery or a 12/24 VDC power supply that plugs into an AC wall outlet. The DC power supply must also be able to supply enough current (amps) to power the motors you choose to use for tracking. **Additionally, the DC power supply can NEVER exceed 30 volts DC or the SunTura Solar Tracker electronics will be permanently destroyed.** Even if the voltages exceeds 30 VDC for only just an instant, the electronics will be permanently destroyed! Windy Nation Inc. recommends a car sized 12 volt battery to power the SunTura Solar Tracker Electronics. The red wire coming out of the Electronics Box connects to the positive output of the DC power supply. The black wire coming out of the Electronics Box connects to the negative output of the DC power supply. See Figure 3 below.

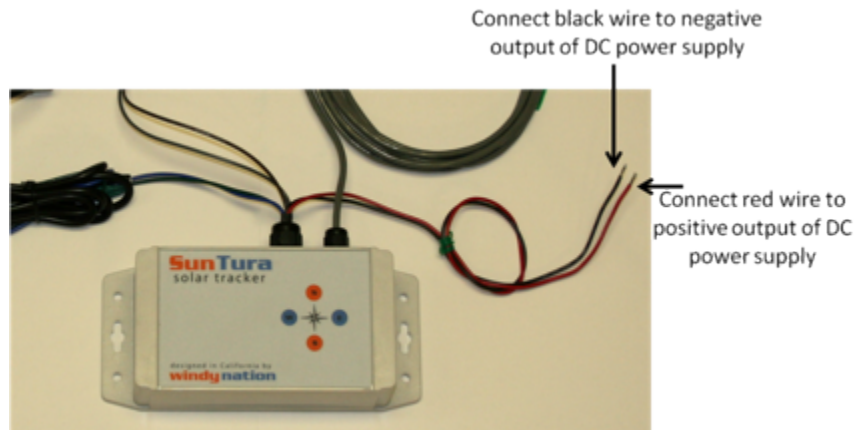


Figure 3: Connecting the SunTura Solar Tracker Kit to a power supply.

3.2.2 North/South Linear Actuator (Motor) Installation

The North/South Linear Actuator or Motor (not supplied) connects to the Green and Blue wires exiting the Electronics Box. Connect the Green wire to the DC positive port of the North/South Linear Actuator/Motor. Connect the Blue wire to the DC negative port of the North/South Linear Actuator/Motor. The SunTura Tracking Electronics will work in the following manner: If the sun is located to the north of the solar tracker, the North/South Linear Actuator/Motor will extend so it positions the solar panels perpendicular to the sun's light rays. If you wish for the North/South Linear Actuator/Motor to retract when the sun is to the north of the solar tracker, then you can simply switch the Green and Blue wires that are connected to the North/South Linear Actuator/Motor.

Verify that the amp draw of the North/South Linear Actuator/Motor that you choose to use does NOT exceed 14 amps.

3.2.3 East/West Linear Actuator (Motor) Installation

The East/West Linear Actuator or Motor (not supplied) connects to the Brown and Grey wires exiting the Electronics Box. Connect the Grey wire to the DC positive port of the East/West Linear Actuator/Motor. Connect the Brown wire to the DC negative port of the East/West Linear Actuator/Motor. The SunTura Tracking Electronics will work in the following manner: If the sun is located to the west of the solar tracker, the East/West Linear Actuator/Motor will extend so it positions the solar panels perpendicular to the sun's light rays. If you wish for the East/West Linear Actuator/Motor to retract when the sun is to the west of the solar tracker, then you can simply switch the Brown and Grey wires that are connected to the East/West Linear Actuator/Motor.

Verify that the amp draw of the East/West Linear Actuator/Motor that you choose to use does NOT exceed 14 amps.

Note: Before powering up the SunTura Solar Tracker electronics be certain there is enough slack in the wires between both Linear Actuators/Motors and the Electronics Box to cover the full range of motion of the solar tracker.

3.2.4 Photo Sensor Installation

For northern hemisphere installations, it is recommended that the Photo Sensor is mounted on the northern side of the solar tracker and that the Photo Sensor has an unobstructed view of the sky (Photo Sensors that are being installed in the southern hemisphere should be mounted on the southern side of the solar tracker.) The side of the Photo Sensor circuit board that is labeled "NORTH" needs to be pointed towards the north.

Note: The edge of the Photo Sensor circuit board that is labeled "NORTH" will be perpendicular (90 degrees) to the north; See Figure 4 below.

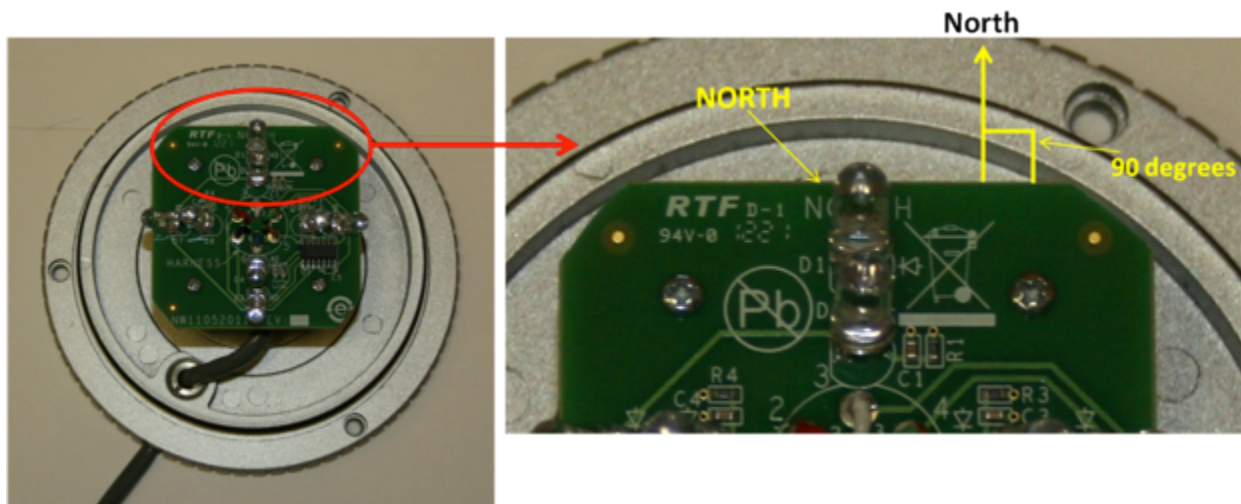


Figure 4: Photo Sensor mounting orientation

3.2.4.1 Mounting the Photo Sensor

Use the included Allen wrench to loosen the two set screws that secure the dome to the Photo Sensor. After the set screws are removed, pull off the Photo Sensor Dome. Note that it is easier to remove the Photo Sensor Dome if a flat head screw driver is used to help lift up the Photo sensor Dome. See Figure 5 below.

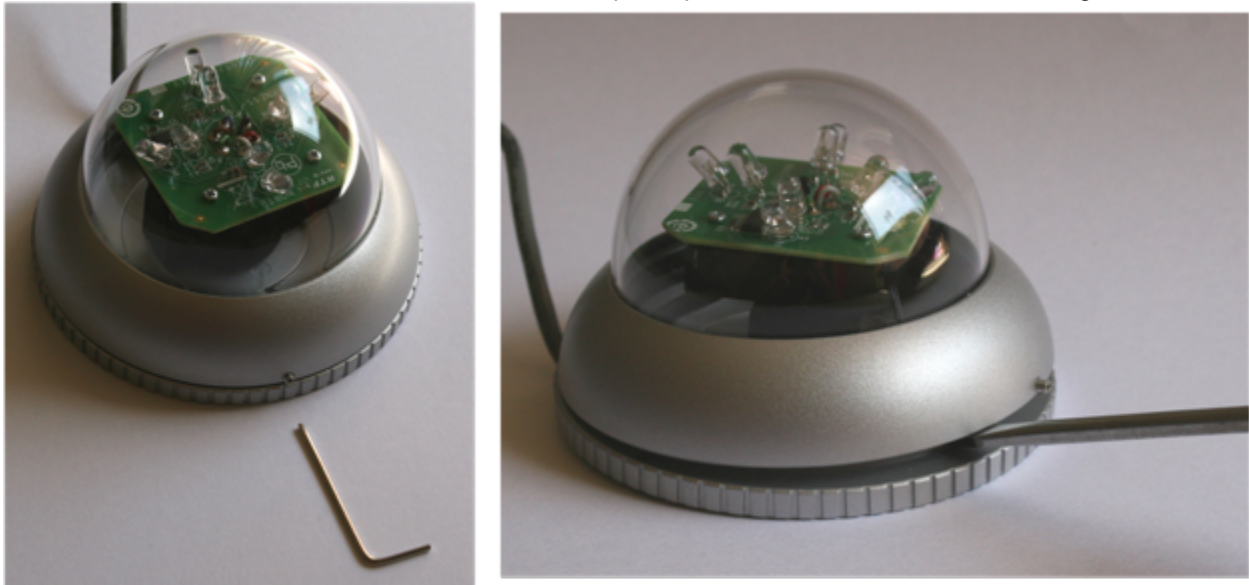


Figure 5: Use Allen wrench to loosen set screws and remove Photo Sensor Dome with flat head screw driver.

Next, mount the included screw sets into the three holes on the Photo Sensor. These screws can be used to mount the Photo Sensor to the solar tracker.

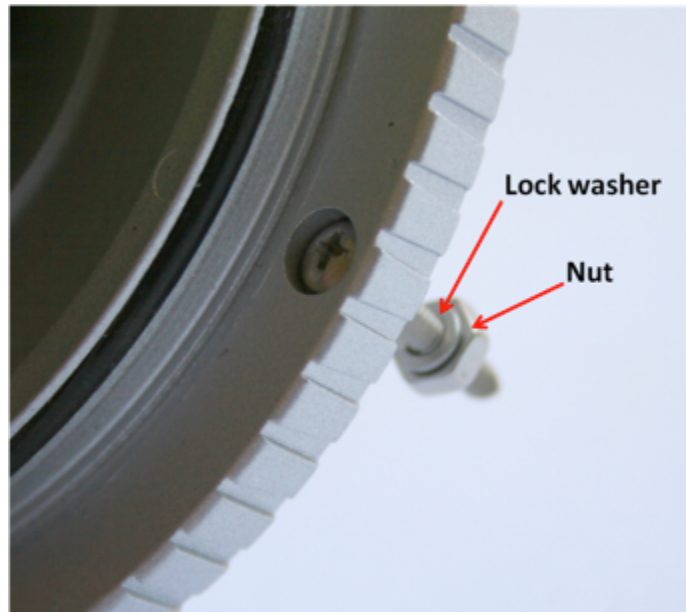


Figure 6: Mounting Fasteners to Photo Sensor.

3.3 FINE TUNING THE LED'S FOR OPTIMAL SOLAR TRACKING

This step is optional. The SunTura Solar Tracker Electronics should track the sun with an accuracy of +/- 7 degrees or better with no fine tuning. Mounting the Photo Sensor slightly off angle (human error) with respect to the solar tracker can lead to a slight tracking inaccuracy. If you wish, the LED's can be adjusted to provide optimal tracking accuracy. **(Do NOT attempt to fine tune the LED's until the Photo Sensor has been fastened to the solar tracker and is in its final position)** To do this, first mount an object on the solar tracker that is perpendicular to the solar panels. This will be used to generate a shadow from the sun's light. Below is an example.

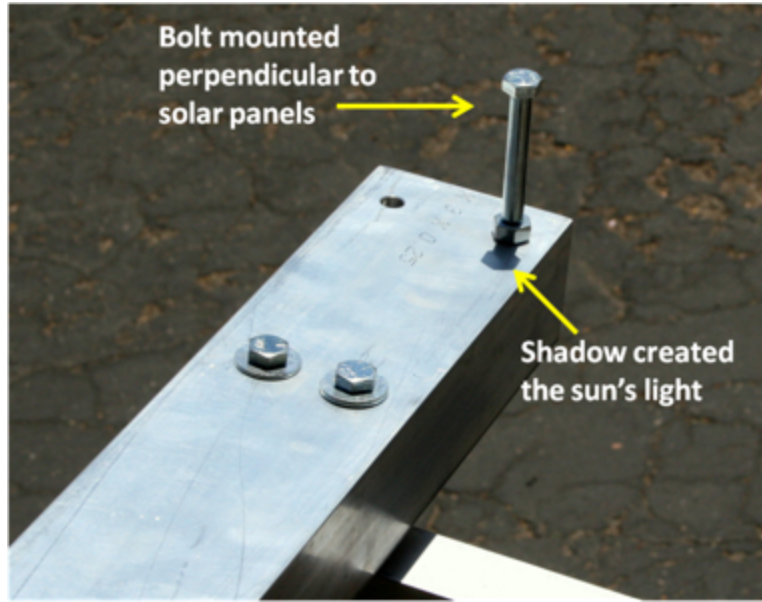


Figure 7: Bolt mounted perpendicular to solar panel angle.

The LED's on the Photo Sensor circuit board can be slightly adjusted to fine tune the accuracy of the solar tracking. The goal is to eliminate the shadow casted by the bolt in Figure 7. The LED's can be moved slightly up or down to accomplish this task. Warning: Do NOT bend the LED's more than 15 degrees from the factory set positions!

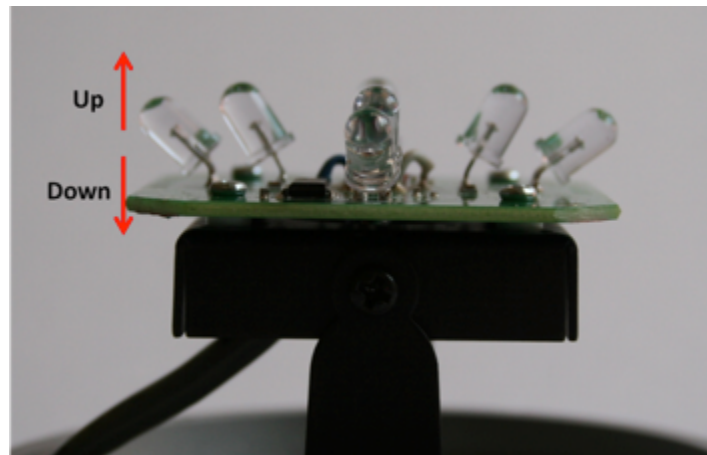


Figure 8: Bending directions for fine tuning the eight LED's on the Photo Sensor circuit board.

To adjust the LED's use the following table:

LED	Adjustment Direction	Result
D1 and D2	move up	track more north
	move down	track more south
D3 and D4	move up	track more south
	move down	track more north
D5 and D6	move up	track more east
	move down	track more west
D7 and D8	move up	track more west
	move down	track more east

It is highly recommended that the LED's are adjusted on a sunny day with no clouds blocking the sun's light. Clouds or anything else slightly blocking the sun's light will negatively affect the accuracy of the LED fine tuning.

Once you are finished adjusting the LED's on the Photo Sensor, re-attach the Photo Sensor Dome and tighten the set screws using the Allen wrench.

4 TROUBLESHOOTING AND SUPPORT

The SunTura Solar Tracker Kit is ruggedly constructed and requires minimal care.

4.1 CARE

To clean your tracker, moisten a cloth with a few drops of mild hand dishwashing detergent in a cup of lukewarm water and gently wipe clean.

4.2 TROUBLESHOOTING

Problem	Possible Remedies
Tracker is not accurately tracking the sun	Follow the Fine-tuning steps included in Section 3.3
Tracker is not working	<ol style="list-style-type: none">1. Check the fuse as shown in Section 3.2.12. Test the source voltage to the tracker Electronics Box3. Check connections to the red and black wires going to the Electronics Box

4.3 SUPPORT

If you are experiencing technical problems, and cannot find a solution in this manual, you can contact Windy Nation Inc. for further assistance.

- Call: (805) 323-6445
- Email: info@windynation.com
- Write: 1082 Front Street, Unit B, Ventura, CA 93001

For challenging issues or to just ask a question, consider using our FREE Community Forums! Consult our community of DIYers for fast answers to all your questions.

Post on our Forums: <http://www.windynation.com/community/>