

Solar LED Christmas Lights Manual

The premium commercial grade Solar LED Christmas Lights are economical, eco-friendly and maintenance free. The light system is plug-and-play and allows you to combine multiple LED Christmas Lights and accessories to fit the needs of your application. Mix and match a solar panel with one or multiple colors of LED Christmas Lights, which are available in: multi-color, warm white, pure white, red, green, and blue LEDs.

The plug-and-play solar panel controller comes preinstalled with a 1200 mAh rechargeable battery and eight built in lighting modes that animate Solar Christmas Lights outdoors. This solar panel uses an ambient light sensor and a 24-hour timer to automatically turn on the Solar LED Christmas lights at night and turn them off during the day. For both indoor and outdoor applications, the Solar LED Christmas Lights can alternatively be paired with your choice of 8-function controllers:

- Battery Box Controller
- Compact Battery Box Controller
- Plug –In Power Adapter Controller
- Plug –In Power Adapter Controller with Infrared remote



Features

- Solar LED Christmas Light Strings can be used in conjunction with any compatible power source of your choice (**sold separately**).
- Self-powered, maintenance free and safe.
- 8 built-in lighting modes to animate Christmas Light Strings.
- Link hundreds of LEDs without dimming.
- Commercial grade construction for high reliability and longevity.
- Weather-proof screw-on connectors enforce secure connectivity.
- Built in memory plays the same lighting mode that was last set.
- Automatically turns on and off by ambient light sensor with timer.
- Preinstalled rechargeable 3.7V 1200mAh battery.

Lighting Modes

	Controller	
Mode	solar-panel-1200mah solar-battop-ctrl-1 solar-battop-ctrl-2 solar-adapt-ir	solar-adapt
1	Combination (Cycles all modes)	Combination (Cycles all modes)
2	Twinkle	Twinkle
3	Chase	Chase
4	Flash	Slow Glow Chase
5	Shuffle	Shuffle
6	Slow Glow	Slow Glow
7	In Waves	Flash Chase
8	Steady On	Steady On

Specifications

Solar Panel Controller

Part Number	solar-panel-1200-mah
Dimensions	94mm x 94mm x 28.5mm
Weight	10.2 oz [0.64 lb] (preinstalled battery included)
On/Off Conditions (Ambient Light Sensor with Timer)	On: Press button; Off: Hold button for 3 seconds. Lighting conditions: On <100 lux; Off >500 lux.
Timer	When turned on and lighting conditions are met, built-in automatic timer keeps lights on for 6 hours, then turns lights off for 18 hours. This timed cycle repeats as long as the lighting conditions are met.
Button Functionality	Press the button once to turn on connected lights and start the timer. Press the button to change lighting mode. Hold the button for three seconds to turn the lights off. This will also turn off the timer. Timer restarts when turned on.
Memory	Plays last set lighting mode
Battery	3.7 Volt Rechargeable LI-ion battery; 1200 mAh
Battery Charge Time	7-8 hours when sun light > 30,000 lux
Battery Run Time	10 hours/full charge
Lifetime (Battery)	300 cycles or 1 year
Lifetime (Solar Panel)	2 years
Branch Length Limit	1200 LEDs per solar panel (400 LEDs if using any red LEDs)
Temperature Conditions	14°F (-10°C) to 140°F (60°C)
Weatherproofing	Waterproof / Snow-proof / Outdoor Safe
Certifications	CE Certified. Lead was not used to make these products.
Warranty	1 year seasonal use limited

Battery Box Controllers

Part Number	solar-battop-ctrl-1
Dimensions	87mm height x 44mm diameter
Weight	4.4 oz [0.28 lb] (no AA batteries included)
On/Off Conditions	On: Press button; Off: Hold button for 3 seconds.
Timer	When lights are turned on, timer keeps lights on for 6 hours, then turns lights off for 18 hours. This timed cycle repeats until you hold the button to turn the lights off.
Button Functionality	Press the button once to turn on. Press the button to change lighting mode. Hold the button for three seconds to turn the lights off.
Memory	Plays last set lighting mode, unless battery is low.
Battery	4 x AA 1.5 Volt batteries
Battery Run Time	33 hours on Steady-On Mode/full charge (with 400 LEDs) before lights will flicker.
Lifetime (Battery Box)	2 years
Branch Length Limit:	400 LEDs per battery box (200 LEDs if using any red LEDs)
Temperature Conditions	14°F (-10°C) to 140°F (60°C)
Weatherproofing	Waterproof / Snow-proof / Outdoor Safe
Certifications	CE Certified. Lead was not used to make these products.
Warranty	1 year seasonal use limited

Part Number	solar-battop-ctrl-2
Dimensions	142mm x 71.5mm x 38mm
Weight	8.5 oz [0.53 lb] (no D batteries included)
On/Off Conditions	On: Press ON/OFF button; Off: Press ON/OFF button.
Timer	Press TIMER once when lights are on to keep lights on for 6 hours and automatically turn lights off for 18 hours. This timed cycle repeats until you press TIMER again to turn the timer off or if you turn the lights off.
Button Functionality	ON/OFF: Turns lights on and off. TIMER: Starts cycle of on for 6 hours, off for 18 hours. FUNCTION: Cycles through the 8 lighting modes.
Memory	Plays last set lighting mode, unless battery is low.
Battery	3 x D 1.5 Volt batteries
Battery Run Time	288 hours on Steady-On Mode/full charge (with 600 LEDs) before lights get dim at the end of the branch.
Lifetime (Battery Box)	2 years
Branch Length Limit	600 LEDs per battery box (300 LEDs if using any red LEDs)
Temperature Conditions	14°F (-10°C) to 140°F (60°C)
Weatherproofing	Waterproof / Snow-proof / Outdoor Safe
Certifications	CE Certified. Lead was not used to make these products.
Warranty	1 year seasonal use limited

Plug-In Power Adapter Controllers

Part Number	solar-adapt
Dimensions	104mm x 42mm x 32mm
Weight	5.3 oz [0.33 lb]
On/Off Conditions	On: Press button; Off: disconnect light strings from the adapter (to keep memory) or unplug adapter from power outlet (this will erase memory).
Timer	None
Button Functionality	Press the button once to turn on. Press the button to change lighting mode.
Memory	Plays last lighting mode if power adapter stays plugged into the outlet. To keep the memory and turn off, disconnect light string from adapter instead of unplugging adapter from wall.
Lifetime	2 years
Branch Length Limit	1,000 LEDs per adapter
Temperature Conditions	14°F (-10°C) to 140°F (60°C)
Weatherproofing	Waterproof / Snow-proof / Outdoor Safe
Certifications	CE Certified. Lead was not used to make these products.
Warranty	1 year seasonal use limited
Part Number	solar-adapt-ir
Dimensions	83.5mm x 38.6mm x 35.5mm (adapter) 86.3mm x 40mm x 7mm (remote)
Weight	7.10 oz [0.44 lb] (remote and remote battery included)
On/Off Conditions	On: Press ON (Remote); Off: Press OFF (Remote).
Timer	When lights are on, TIMER ON keeps lights on for 6 hours, then turns lights off for 18 hours. This timed cycle repeats until OFF or TIMER OFF button is pressed.
Remote Working Distance	8 meters
Button Functionality (on remote)	ON: turn lights on; OFF: turn lights off; TIMER ON starts cycle of on for 6 hours, off for 18 hours; TIMER OFF: no cycle, just waits for ON/OFF buttons to be pressed. Buttons 1-8: Lighting Modes.
Memory	Adapter must remain plugged in and TIMER ON to keep memory to play the last selected scene. If power is disconnected to the adapter, lights revert to Mode 8.
Battery (for remote)	CR2025
Lifetime	2 years
Branch Length Limit	1,000 LEDs per adapter
Temperature Conditions	14 °F (-10°C) to 140 °F (60 °C)
Weatherproofing	Waterproof / Snow-proof / Outdoor Safe
Certifications	CE Certified. Lead was not used to make these products.
Warranty	1 year seasonal use limited

Instructions

Use the components below with the LED Christmas Light Strings to assemble a self-powered, maintenance-free light system. For alternative lighting system options, the LED Christmas Light Strings are also compatible with battery-powered controllers or plug-in adapters. Instructions for these other lighting options are listed in the pages that follow the solar panel instructions below.

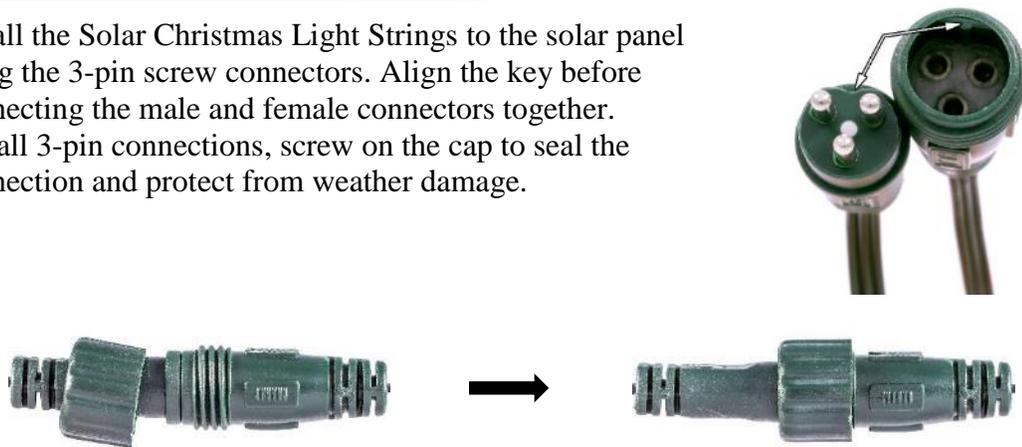
Solar Panel - solar-panel-1200-mah

Components



Connecting to Solar LED Christmas Light Strings

1. Install the Solar Christmas Light Strings to the solar panel using the 3-pin screw connectors. Align the key before connecting the male and female connectors together.
2. For all 3-pin connections, screw on the cap to seal the connection and protect from weather damage.



Mounting Solar Panel Assembly

3. Insert the connecting rod into the slot just below the battery cover.
4. Connect the spike to the connecting rod.
5. Insert the spike in the desired location where the panel will get the most sunlight throughout the day. The spike should be mounted in such a way that the solar panel is facing south at a 20° - 30° angle.
6. Charge the solar panel in direct sunlight for at least 8 hours before powering any Christmas lights. If it is a cloudy day, it may take longer to fully charge.



Controlling Solar LED Christmas Light Strings

7. Choose a time in the evening that is desired for the Christmas lights to turn on each night. Wait until the chosen time, then press the button on the back panel to turn lights on. *Note that the lights will turn off within a few seconds if ambient light sensor detects light > 500 lux.
8. Press the button again to scroll through the 8 lighting modes until the desired lighting mode is reached.



The 24-hour timer begins when you turn the lights on: Lights will stay on for 6 hours at night, then turn off and charge for 18 hours during the day. This cycle repeats every day. To reset the timer, hold the button for 5 seconds. Then repeat Step 7 and 8.

9. Confirm the following before leaving the maintenance free Christmas lights:
 - a. The solar panel will be exposed to the sun as much as possible each day.
 - b. The solar panel is not too close or directly facing any light source at night.
 - c. All keys are all aligned at each connection and caps are screwed on tight.
 - d. The Christmas lights turned on at night time.
 - e. The spike is secured in its position where it will not get knocked over by wind/rain/snow.

Replacement Battery:

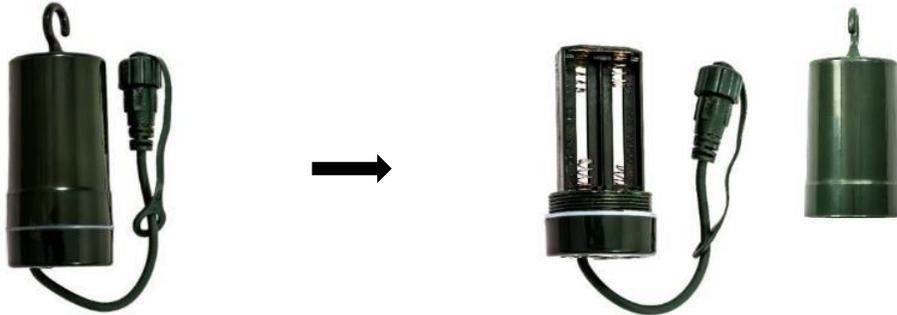


[solar-battery-1200mah](#)

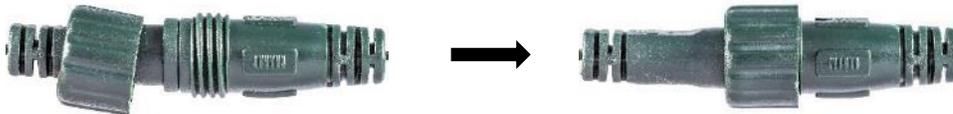


Battery Box Controller: solar-battop-ctrl-1

1. Open the Compact Battery Box Controller by unscrewing the cylinder cover from the top cap.



2. Install four new AA 1.5VDC Batteries (not included with package) in the box.
3. Screw the cylinder cover back to the top cap.
4. Install the Solar Christmas Light Strings with any desired splitters and extension cords to the battery box using the 3-pin screw connectors. Align the key before connecting the male and female connectors together.
5. For all 3-pin connections, screw on the cap to seal the connection and protect from weather damage.



6. Check that all connections are screwed on tight. This includes the connections between the controller and the Strings, between each of the 100 light strings, and between any other connectors such as 3-way splitters, T-connectors and extension cables.
7. Choose a time each day/night that it is desired for the Christmas lights to turn on. Wait until the chosen time, then press the button on the bottom of the cylinder. This will now begin and repeat the 24-hour cycle: Lights will stay on for 6 hours, then turn off for 18 hours.
8. Press the button until the desired mode plays. The lighting mode can be changed at any time while the lights are on by pressing the button to move through the 8 different modes. These are listed on page 2.
9. Confirm the following day:
 - a. The Christmas Light Strings automatically turned on at the exact time that they were turned on the day before.
 - b. The Christmas Light Strings automatically played the same lighting mode function that was played last.
10. Now the battery box can be hung in a stable location using the hook on top of the cylinder. The light assembly is now maintenance free and weather-proof.

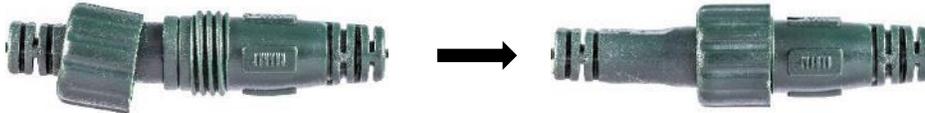


Battery Box Controller: solar-battop-ctrl-2

1. Open the Battery Box Controller by unscrewing the 4 screws on the box with a Phillips screwdriver.
2. Install three new D 1.5V Batteries (not included with package) in the box.
3. Screw the box back together using the same 4 screws.
4. Install the Solar Christmas Light Strings with any desired splitters and extension cords to the battery box using the 3-pin screw connectors. Align the key before connecting the male and female connectors together.



5. For all 3-pin connections, screw on the cap to seal the connection and protect from weather damage.



6. Check that all connections are screwed on tight. This includes the connections between the controller and the Strings, between each of the 100 light strings, and between any other connectors such as 3-way splitters, T-connectors and extension cables.
7. Press the ON/OFF button on the front of the battery box. Confirm that the Christmas lights turn on.
8. Press the FUNCTION button until the desired lighting mode plays. The lighting mode can be changed at any time while the lights are on by pressing the button to move through the 8 different modes. These are listed on page 2.
9. If you wish to utilize the timer function, choose a time each day/night that is desired for the Christmas lights to turn on. Wait until the chosen time, then press the TIMER button. This will now begin and repeat the 24-hour cycle: Lights will stay on for 6 hours, then turn off for 18 hours.
10. Confirm the following day (if timer function is used):
 - a. The Christmas Light Strings automatically turned on at the same time that they were turned on the day before.
 - b. The Christmas Light Strings automatically played the same lighting mode function that was played last.
11. Now the light assembly can be left alone, maintenance free and weather-proof.

Plug-In Power Adapter Controller: solar-adapt

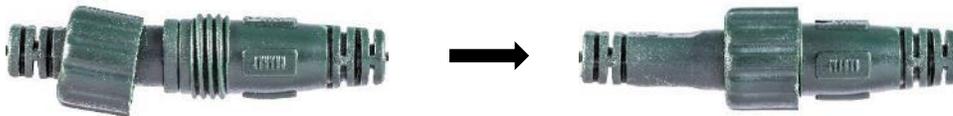
1. Connect the power adapter to the 3-pin connector cable by aligning pins 0, 1 and 3. The opposite end of the 3-pin connector cable will connect to the Christmas Lights.



2. Install the Solar Christmas Light Strings with any desired splitters and extension cords to the adapter using the 3-pin screw connectors. Align the key before connecting the male and female connectors together.



3. For all 3-pin connections, screw on the cap to seal the connection and protect from weather damage.



4. Confirm that all connections are screwed on tight. This includes the connections between the controller and the Strings, between each of the 100 light strings, and between any other connectors such as 3-way splitters, T-connectors and extension cables.
5. Plug in the power adapter controller into a 120 VAC outlet.
6. Press the button on the adapter until the desired mode plays. The lighting mode can be changed at any time while the lights are on by pressing the button to move through the 8 different modes. These are listed on page 2.
7. To keep the memory function on and have the lights play the last mode set, turn the lights off by disconnecting the light strings from the power adapter.



Note: If power being supplied to the adapter is disconnected (ie. power adapter is unplugged from the outlet), the memory function will restart and the lights will revert to Mode 8.

Plug-In Power Adapter Controller: solar-adapt-ir

1. Connect the power adapter to the 2-pin connector cable by aligning the pins to the slot and the hole of the power adapter. The opposite end of the 2-pin connector cable will connect to the Christmas Lights.



2. Install the Solar Christmas Light Strings with any desired splitters and extension cords to the adapter using the 3-pin screw connectors. Align the key before connecting the male and female connectors together.



3. For all 3-pin connections, screw on the cap to seal the connection and protect from weather damage.



4. Confirm that all connections are screwed on tight. This includes the connections between the controller and the Strings, between each 100 Christmas Strings, between any other connectors such as 3-way splitters, T-connectors and extension cables.
5. Plug in the power adapter controller into a 120 VAC outlet.
6. Press ON located on the IR remote. Choose a time each day/night that is desired for the Christmas lights to turn on. Wait until the chosen time, then press TIMER ON from the remote. This will now begin and repeat the 24-hour cycle: Lights will stay on for 6 hours, then turn off for 18 hours.
7. Press any of the numbers 1-8 on the remote to choose the lighting mode. These are listed on page 2. If the timer is used, the same lighting mode will automatically turn on each day. Note: If power being supplied to the adapter is disconnected (ie. power adapter is unplugged from the outlet), the memory function will restart and the lights will revert to Mode 8.



Compatible Products

The accessories and solar lights below are compatible with all of the controllers mentioned above. Please refer “Controller Capacities” section on the following page to find out how many Solar Christmas Light Strings can be linked to each controller.

Splitters:



[solar-3way-split](#)



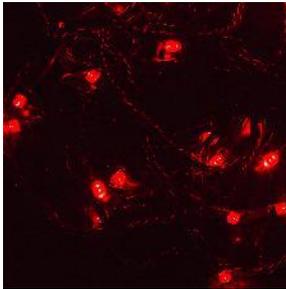
[solar-tconn](#)

Extension Cord:

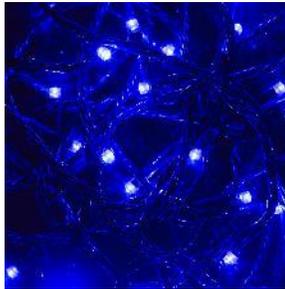


[solar-ext-5m](#)

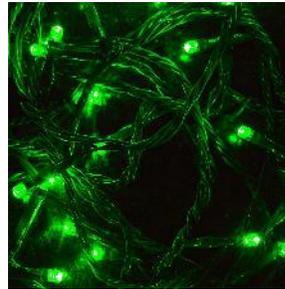
Solar Christmas Light Strings



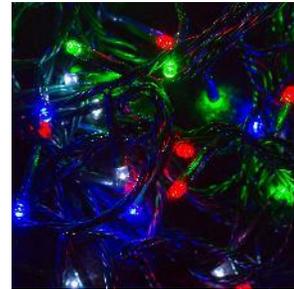
[solar-5mm-red-g](#)



[solar-5mm-blue-g](#)



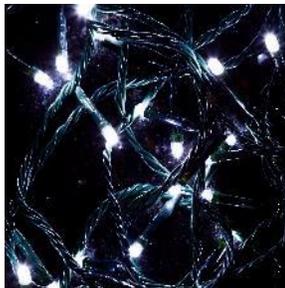
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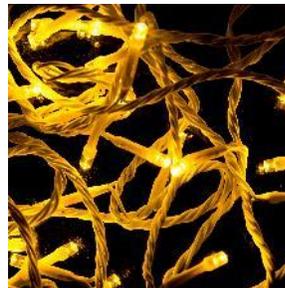
[solar-5mm-multi-g](#)



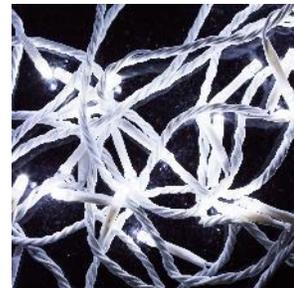
[solar-5mm-ww-g](#)



[solar-5mm-pw-g](#)



[solar-5mm-ww-w](#)



[solar-5mm-pw-w](#)

Note: solar-5mm-ww-g light strings are the same color as the previous soft white solar light strings, Part No. 7111. The solar-5mm-pw does not match and has more of a bluer hue than the previous neutral white solar light strings, Part No. 7116.

Controller Capacities

The chart below lists the maximum recommended branch length limit of lights for each of the controllers. Please remember that if the branch length limit is exceeded, the lights will be dimmer towards the end of the branch.

Controller	Part #	Capacity (Watts)	LEDs per string	Max LEDs Per Branch	Max Strings Per Branch	Power per string (Watts)
Solar Panel	solar-panel-1200-mah	1.41	100	800	8	0.8
Compact Battery Box	solar-battop-ctrl-1	0.71	100	400	4	0.8
Battery Box	solar-battop-ctrl-2	0.40	100	600	6	0.8
Plug-In Power Adapter	solar-adapt	7.99	100	1,000	10	0.8
Plug-In Power Adapter with Infrared Remote	solar-adapt-ir	4.92	100	1,000	10	0.8

Troubleshooting

A) Christmas Lights fail to light up or do not remain lit for long enough.

If the Christmas Light Strings fail to light up, please check the following:

- **Connectivity:** Confirm that the first connector from the solar panel to the LEDs is properly and securely connected, and all connectors in the same branch are also securely connected. Make sure that the key for each connector is lined up between the male and female connectors before they are connected.

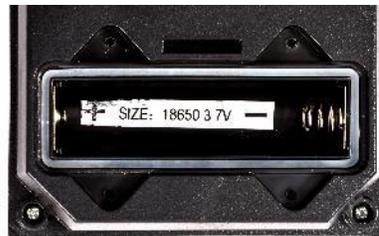


- **Battery Charge:** Confirm that the solar panel is getting enough sunlight throughout the day, make sure it is facing south and positioned at an angle of 20-30 degrees. There should be at least 8 hours of direct sunlight exposure each day for the battery to be fully charged and turn the lights on for 6 hours each night.
- **Lighting Conditions:** Confirm that the solar panel is in a completely dark environment. The solar panel's ambient light sensor is on the front of the panel and the lights will turn off in a few seconds if the solar panel's ambient light sensor senses flux greater than 100 lux. The lights will only stay on at night time so to test, you can simply put the front of the panel face down on a flat surface to prevent any light from getting to the light sensor. Then press the button to turn the lights on. If they stay on when the front panel is faced down, then this means that the ambient light sensor detects light greater than 100 lux where the panel is currently located. Try moving the solar panel further away from the

LEDs (use an extension cord, solar-ext-5m, if necessary) and position the panel so it does not face the LEDs or any other sources of light.

- Battery functionality: The battery lifetime may have run out and may need to be replaced. First confirm that the solar panel with installed battery were exposed to direct sunlight for 7-8 hours straight by periodically checking every 2 hours that the assembly is not in shade.

1. Unscrew the 4 screws of the battery cover on the back of the panel using a small Phillips screwdriver.



2. After inserting the battery, screw on the battery cover back to the panel.
 3. Use a Digital Multimeter (DMM) in the voltage setting to measure the voltage. The voltage should be at least 3.7V. If the voltage is lower than 3.7V after charging in the sun for 8 hours, the battery should be replaced. Replacement batteries, solar-battery-1200mah, can be ordered from environmentallights.com.
- Solar Panel functionality: First confirm that the solar panel with installed battery was exposed to direct sunlight for 7-8 hours straight by periodically checking every 2 hours that the assembly is not in shade. To test the solar panel's functionality, lay the solar panel face down on a flat surface to ensure that no light triggers the ambient light sensor. Check the connections between the solar panel and the Christmas light strings. Press the button on the back of the solar panel to turn the lights on. If they still do not turn on, the panel may be defective. Please call Environmental Lights.

B) Dim lights

Branch length limit for Solar Panel is 800 LEDs, but if it is desired for the LEDs to be brighter, use less LEDs per panel. 400 LEDs per panel to avoid having dim LEDs. It is recommended to create additional branches instead. For example, instead of putting 8 strings linked end-to-end in one branch, buy a 3-way splitter and create 2 branches of 4 strings, or 3 branches of 3 strings. If the lights still appear dim, remove 100 lights at a time from the branch until the desired brightness is achieved. Putting more than 400 LEDs in one branch for the solar panel will dim the lights.