

Solar Lights

Solar light consists of following components and functions.

Component	Function
Solar Panel	Generates electricity from sun light for charging
Rechargeable Battery	Stores electricity in battery
Light Emission Diodes (LEDs)	Emits light
Motion Sensor	Senses motion as well as daytime and nighttime
Controller	Controls solar light system
Switch	Changes modes of operation manually
Remote	Changes modes of operation remotely

Four types of solar lights (#1, #2, #3, and #4) have been evaluated.



Solar Light #1 (100 (15 + 35 + 35 + 15) SMD (Surface Mounted Device) LEDs; no remote) under actual use



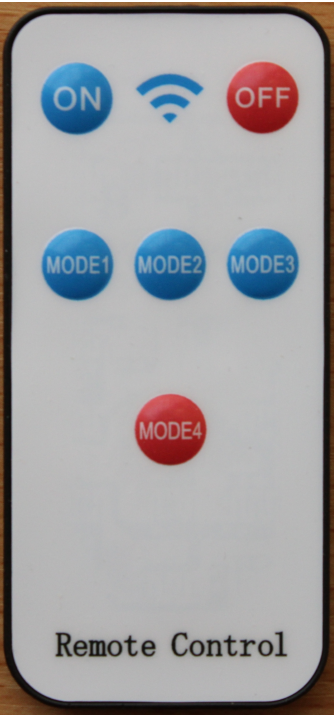
Solar Light #2 (72 (12 x 6) COB (Chip On Board) LEDs; no remote) not applicable due to low brightness



Solar Light #3 (52 (8 + 36 + 8) SMD (Surface Mounted Device) LEDs; no remote) under actual use



Solar Light #4 (290 (70 + 80 + 70 + 70) SMD (Surface Mounted Device) LEDs;
with remote) under actual use



Remote



Solar Light #4 (Support stand)

Solar Light #4 in use (lighting patio)



Low light (Mode 1)



Strong light (Mode 2)

Shoot conditions; Manual Focus, 20 seconds Exposure (Bulb), f16 Aperture with a tripod & shutter remote

Modes of Operation

Solar light #1, #2, #3				
Mode	Sunlight Sensor			
	Nighttime		Daytime	
	Motion Sensor			
	On	Off		
1	Strong light		Off	
2	Strong light	Low light		
3	Low light			
4	Off			

Solar light #4				
Mode	Sunlight Sensor			
	Nighttime		Daytime	
	Motion Sensor			
	On	Off		
1	Low light		Off	
2	Strong light	Low light		
3		Light off		
4	Strong flashing light			

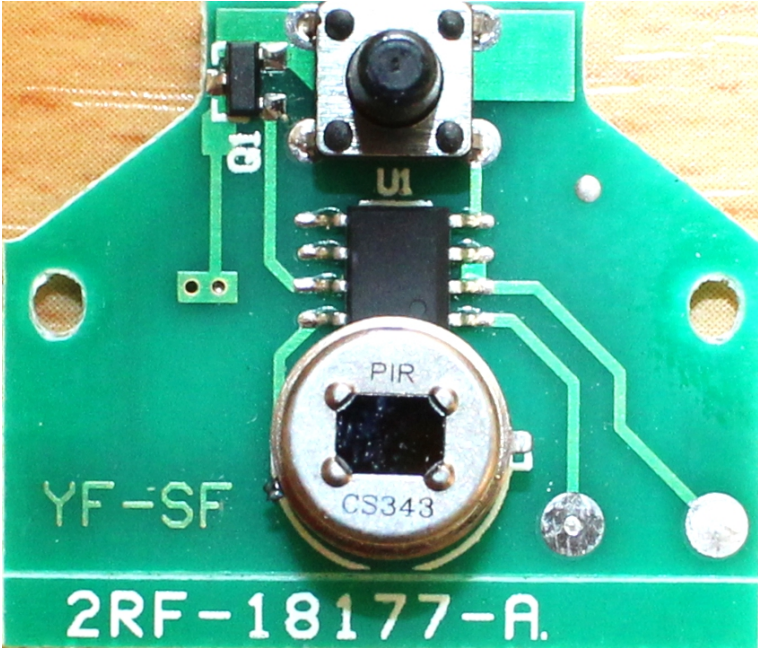


Charging "Solar light #1 & #3" for indoor use on patio roof putting on 18 eggs carton

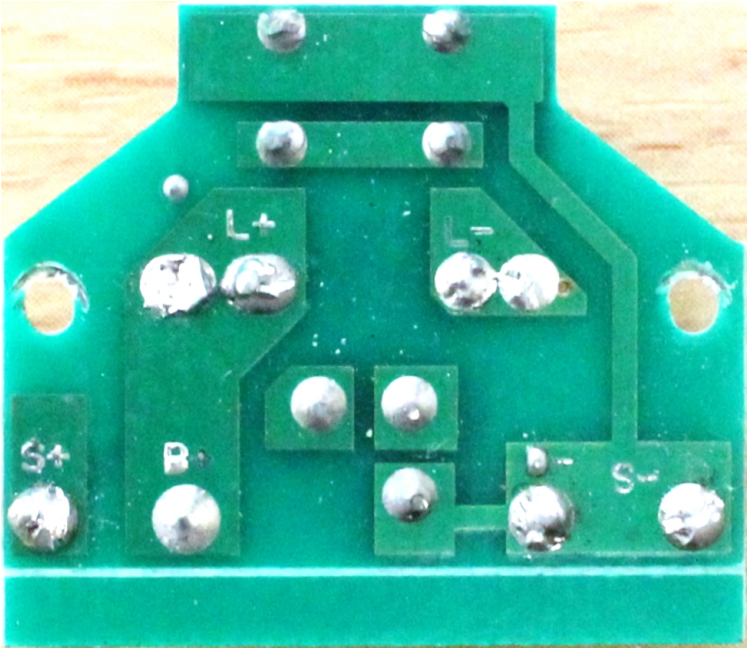
Solar Light Improvement

(1) Solar light #1

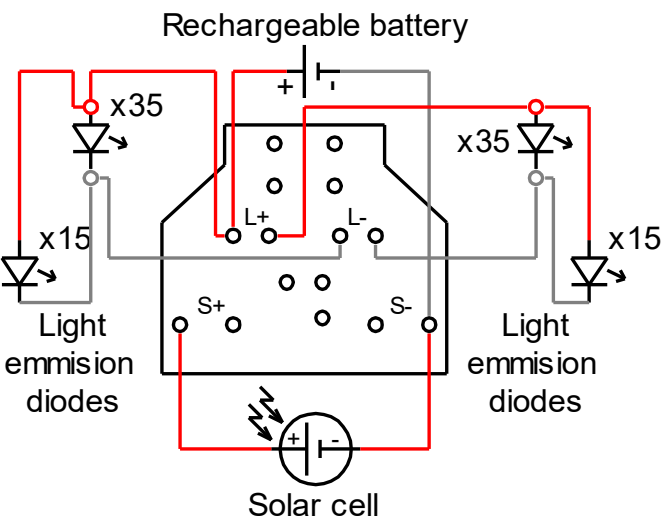
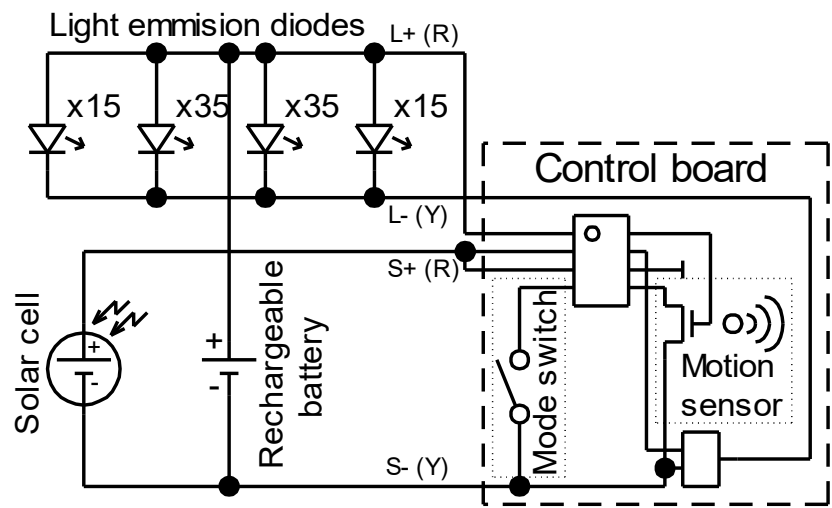
Control Board



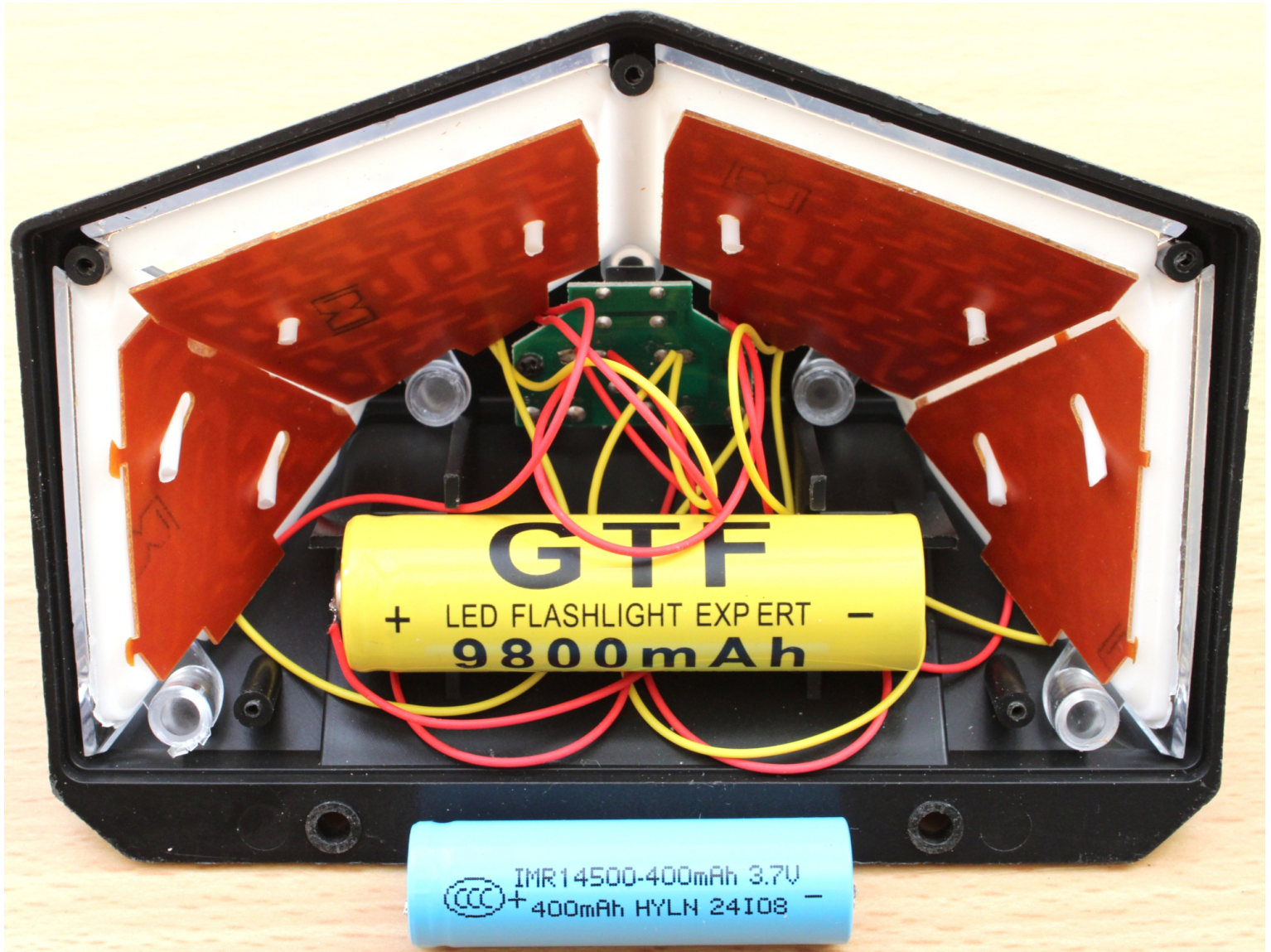
Front



Rear

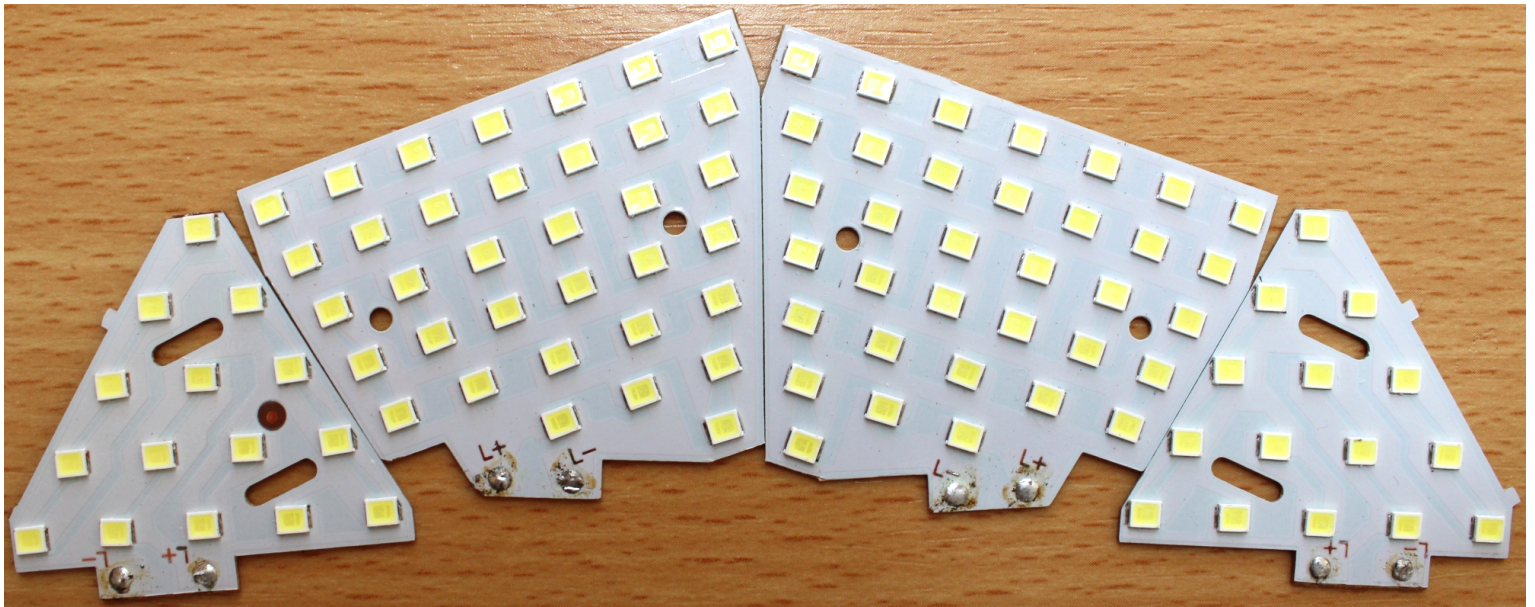


Rechargeable Battery

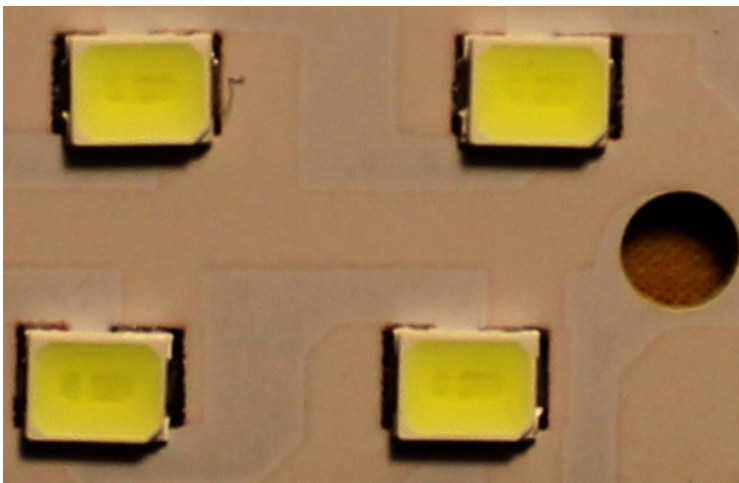


Original "IMR 14500 3.7V 400mAh" was upgraded to "TR 18650 3.7V 9800mAh"

LED (Light Emission Diode) Board



Four LED boards (15 + 35 + 35 + 15 LEDs; Total 100 LEDs)

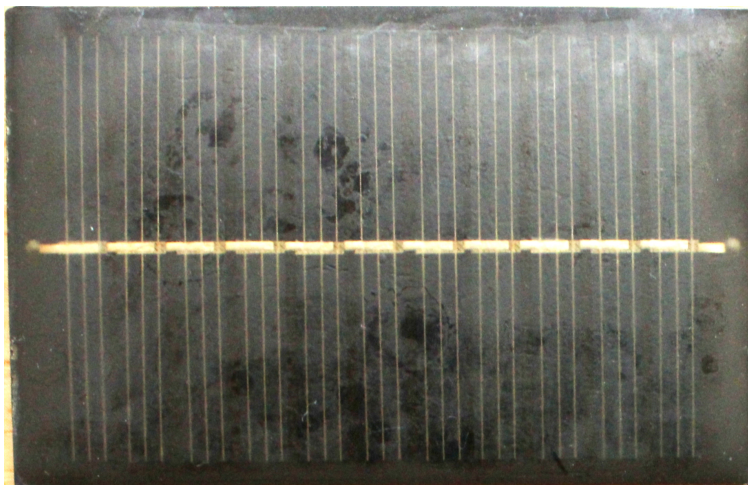


Small diode cells surface mounted

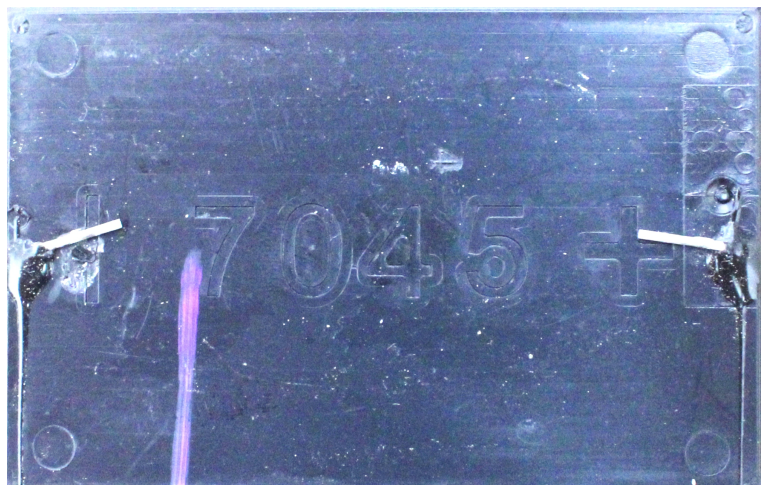


Large diode cells surface mounted

Solar Cell

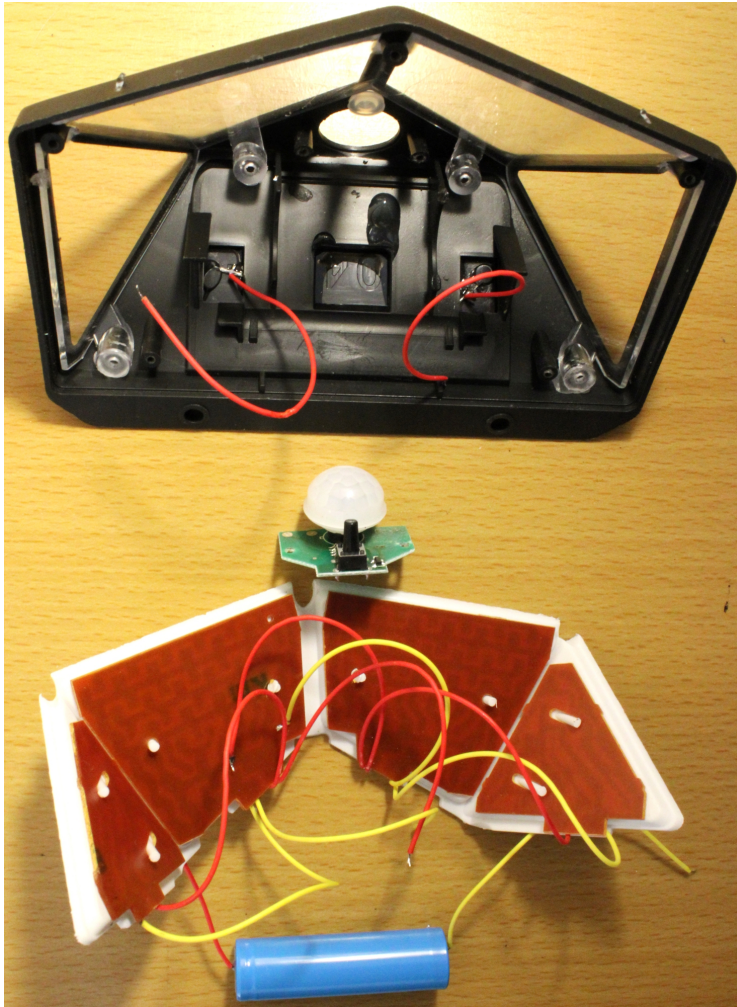


Front

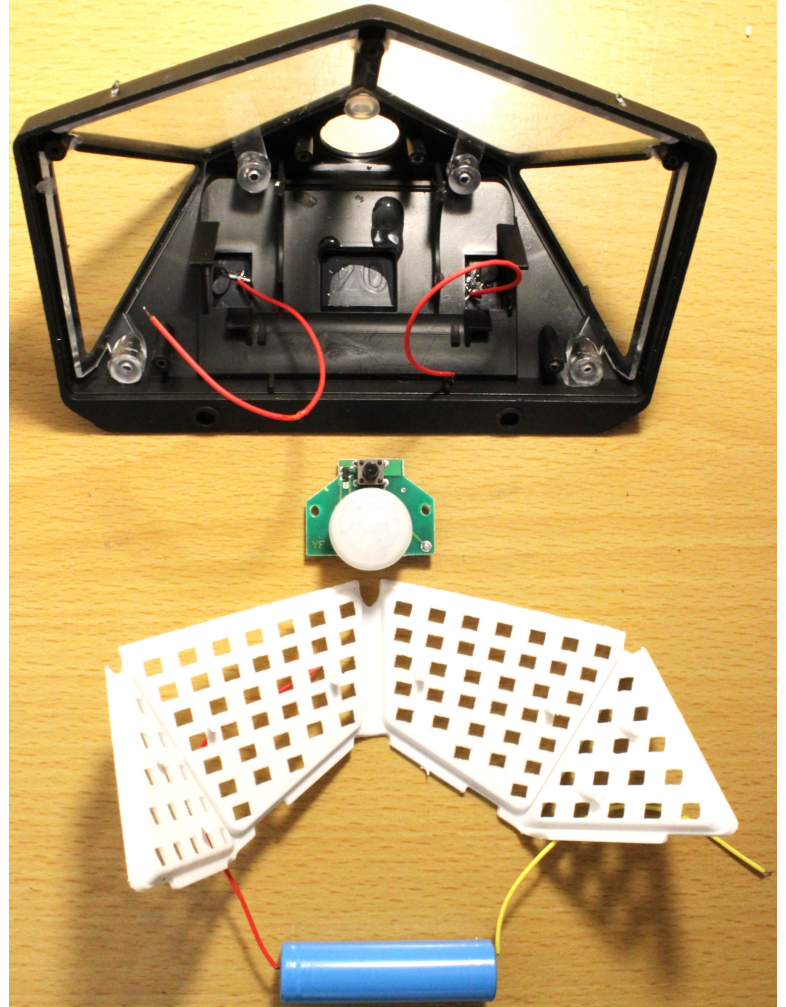


Rear

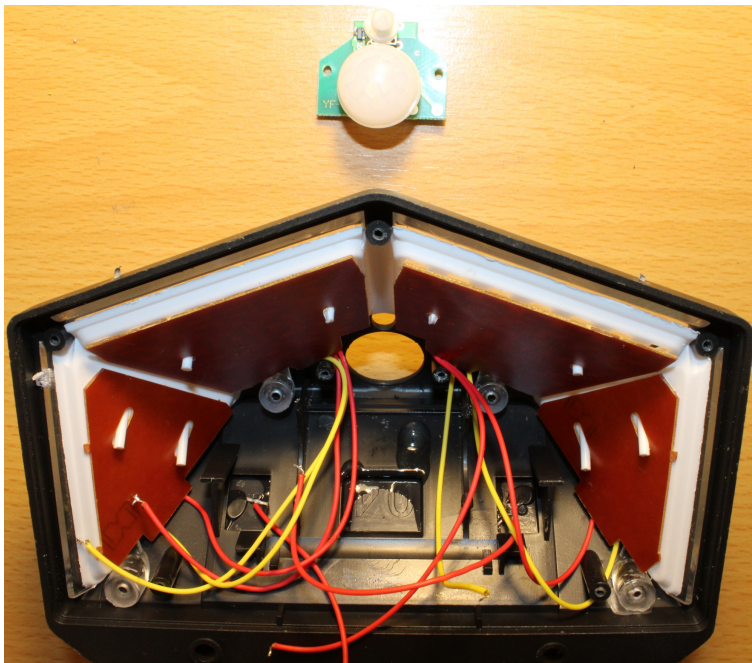
Disassembly



Detached; Solar light frame with Solar cell,
Control board with motion sensor and switch,
LED boards and assembly with rechargeable battery

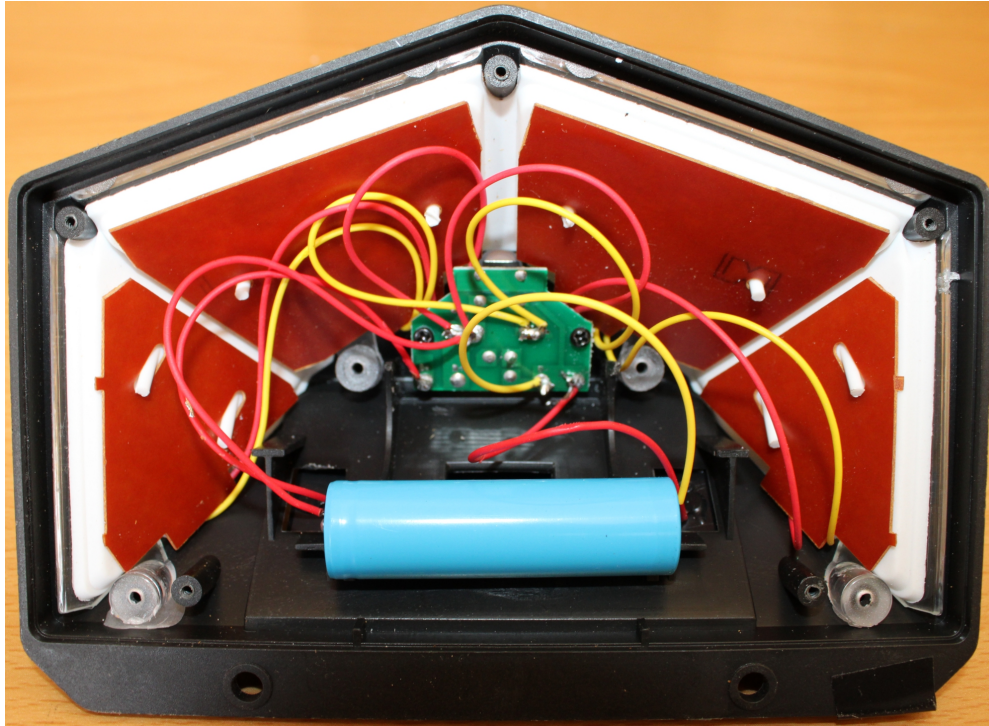


LED boards detached

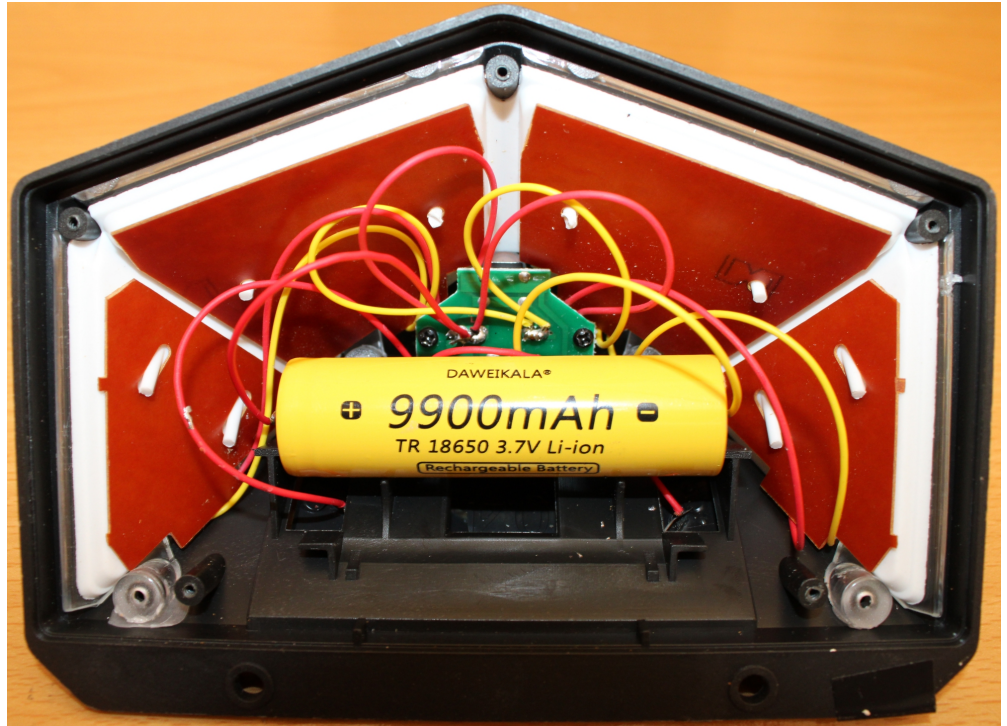


LED boards and assembly attached to solar light frame

Assembly



Assembled with small battery

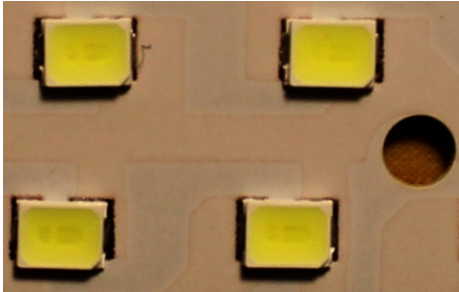
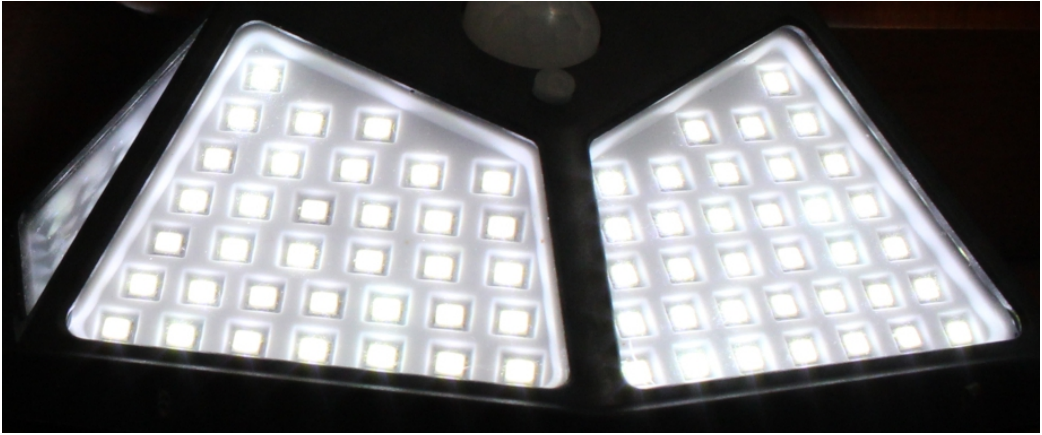


Assembled with large battery

The solar light frame implements two battery support fins to hold both small and large battery wisely.

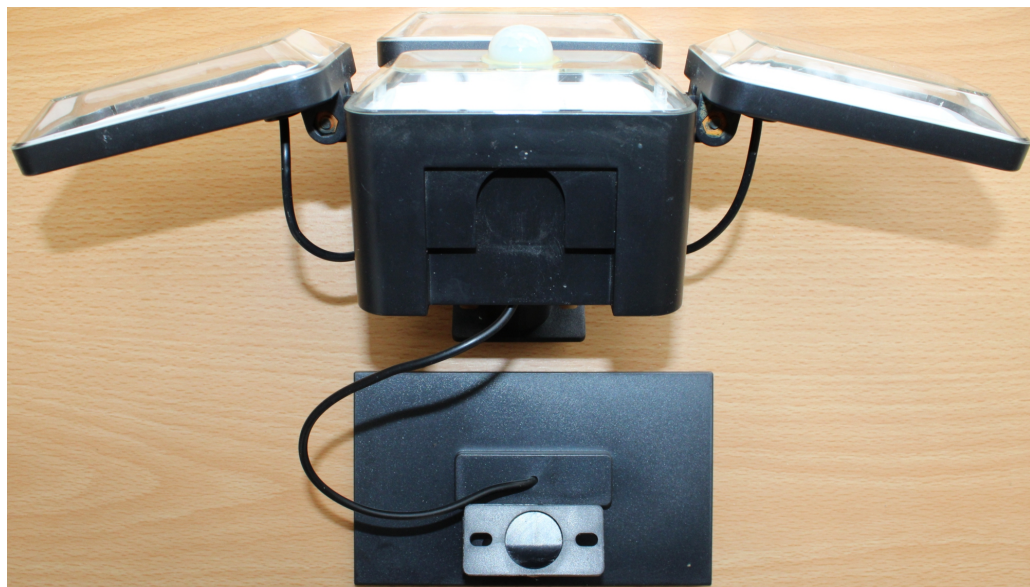
Replacing small battery and LEDs to large battery and LEDs is similar to Overclocking sometimes done in PC world that intensifies the performance. See next page.

Comparison

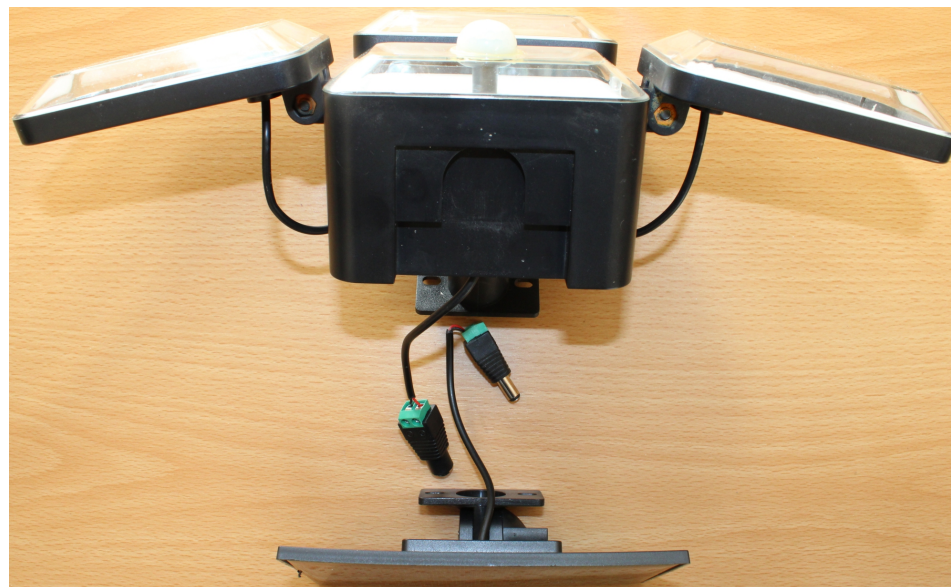
LED	Battery	Brightness
 Small	 Small	
		
 Large	 Large	

(2) Solar light #4

Originally, this solar light placed under the patio roof, the solar cell was unable to provide sufficient charge because sunshine is blocked by the roof. After detaching the solar cell and placed it over the patio roof, the solar light started getting sufficient charge and working without problems.



Wiring from solar cell to light



Separate solar cell and light for extension cord connection



Separated solar cell (over the patio roof)



Solar light with no solar cell (under the patio roof)