

**SOLAR GARDEN LIGHT 5 LED**  
CODE 1002 **LEVEL 1**

An automatic guided light circuit, to be installed at places where light is required before getting dark.

**Technical specifications:**

- Power supply from rechargeable battery size AAx3 pcs. (not included)
- Consumption : 2.5mA. (standby in sensor mode), 80mA. (working in sensor mode), 100mA.(ON mode).
- Built-in recharging circuit from solar panel.
- Power of solar panel : 4VDC. 60mA.
- Can select mode by slide switch.
- Adjust sensitivity with potentiometer.
- PCB dimensions : 2.64 x 1.70 in.

**How to work:**

The circuit is divided into two parts, charger and sensor.

The charger consists of solar panel, TR1 and TR3. When solar panel is facing sunlight, it will convert sunlight energy to DC voltage and then run through TR1 and TR3 for charging the rechargeable batteries.

For the sensor, the working of sensor circuit will be controlled through the sliding switch "SW". Slide the switch SW to position "1" for photo-transistor working selection.

When the photo-transistor gets light, its internal resistance will be lower and causing TR5 unable to work. Then TR4 does not work. All LEDs are not lighted either.

When the photo-transistor gets no light, its internal resistance will be higher and TR5 will get voltage for bias. Then TR4 will work and light up all LEDs. TR2 and VR1 will act as the speed controllers for detecting the light of photo-transistor.

The circuit will be off when moving the switch SW to position "2" and directly supply voltage to LEDs being lit up without referring to photo-transistor when moving it to position "3".

**Circuit connecting:**

External connecting and fitting of components are shown in figure 3. It is recommended to assemble the circuit starting with a less height component i.e. diodes, resistor, electrolyte capacitors and transistors etc. Be careful while assembling and check for the matching of PCB poles and components before soldering as shown in Figure 1. Use a max. 40W. solder and soldering lead with a tin and lead ratio of 60/40 together with a joint solution inside. Recheck the assembled circuit for your

own confidence. Better using a lead sucker or a lead wire absorber in case of misplacing component to protect PCB damage.

**Testing:**

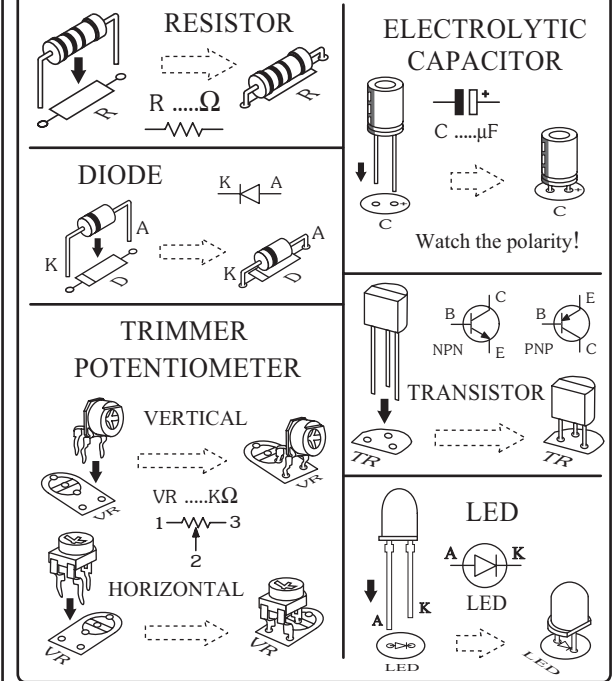
Turn the solar panel facing sunlight. All LEDs will be lighted up when slide switch SW to position "3" and the circuit will be off when slide to position "2".

When slide switch SW to position "1", the sensor circuit will start detecting light through photo-transistor. When photo-transistor detects light, LEDs will be off. But when it detects no light, LEDs will be lit up. The brightness of LEDs is depended upon the light volume received and VR1 will act as speed controller for detecting the light of photo-transistor.

**NOTE:** The solar panel can not convert fluorescent light to DC voltage.

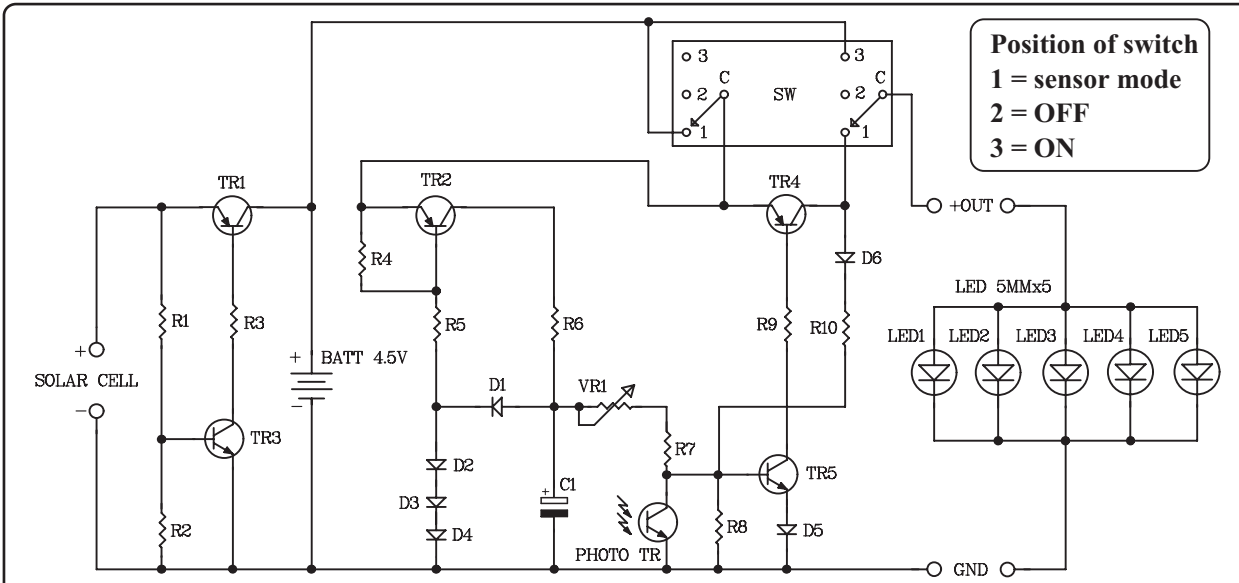
**CAUTION:** Whenever using solar panel, be careful not to short circuit the positive and negative poles. The short circuit will damage the solar panel.

**Figure 1. Components installation.**

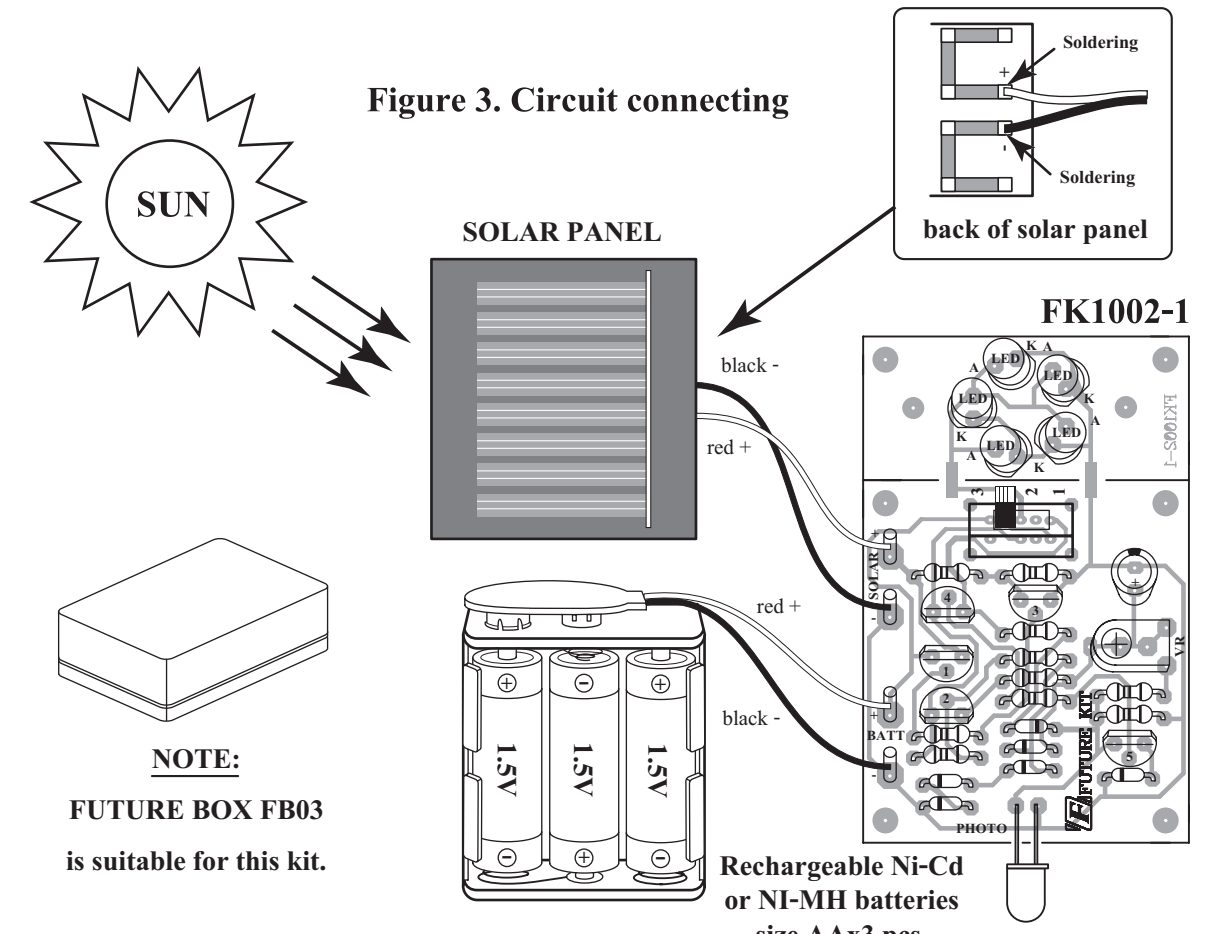


**Troubleshooting:**

As the circuit has only a few components, the main cause of troubles will come from misplacing component and defaulted soldering. When the circuit does not work, check the placing component and various soldering points.



**Figure 2. SOLAR GARDEN LIGHT 5 LED circuit**



**NOTE:**  
FUTURE BOX FB03  
is suitable for this kit.

**\*\*\* Remark \*\*\*** When you see from top, photo-transistor is black and LED is yellow.