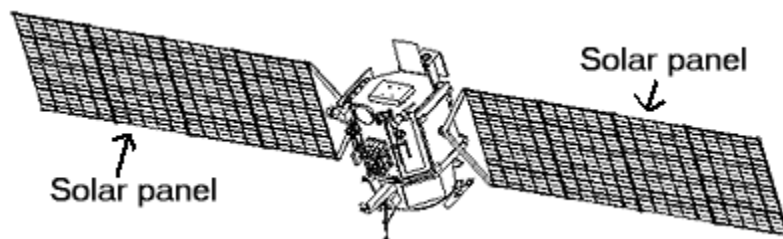


# Solar Panel Installation and Working

## What is Solar Panel?

Solar Panel is a device that alters light energy into electric energy. They are named solar panels because the light energy converted by these panels is taken from the biggest light source on the planet i.e. SUN. Astronomers call it Sol and some scientists name it photovoltaic which simply means "light electricity".

A collection of a number of solar cells is called Solar Panel. A number of small solar cells are split over a large surface area may work together to supply adequate amount of energy to be used in various applications. The more amount of light which hits the solar cell means more amount of electricity generation. As a result spacecraft are generally intended with solar panels that can at all times be positioned towards the Sun even as the remaining spacecraft body moves around. DS1's solar cells are extra efficient than normal solar panels prepared for satellites as they bring into play solar concentrators.



## How Does Solar Panel Work?

Solar panel gathers the radiation from the sun and actively translates the solar energy into electric energy. Solar panels are nothing but a cluster of solar cells. These solar cells operate likewise to big semiconductors and make use of a big-area p-n junction diode. When solar cells are out in sunlight, the p-n junction diodes alter the solar energy from sunlight into utilizable electrical energy. The solar energy produced from photons hitting the area of the solar panel permits electrons to knock out of their paths and set free, and electric fields in the photovoltaic cell drag these liberated electrons in an undeviating current, from which metal get in touch with the photovoltaic cell, which can produce electricity. Increase the number of solar cells in a solar panel, make use of best quality solar cells and the result will be more electrical production which the solar panel can generate. The translation of daylight to utilizable electrical energy has been named the Photovoltaic Effect. The photovoltaic effect takes place from the characteristics of the p-n junction diode; in actuality there are no movable components in a solar panel.

## How to Make a Solar Panel?

It is achievable to construct your exceptionally initial systematically functional solar panel? Let's see what material we require -

1. Solar Cell- a cluster of solar cell is required to make solar panel. These solar cells are required to collect energy from sunlight and convert it into electric energy.
2. Plywood – Plywood or some other wood surface to place the solar cells.

3. Plexiglass – Plexiglass or any other glass that can shield solar cells from poor climate conditions. Prefer plexiglass over normal glass as it is tougher than glass and will not break easily.
4. Tin Tabbing Wire – This wire will be employed to attach solar cells collectively.
5. Solder – If you do not have solder iron then buy one cheap solder iron from your local vendor.

## *How to Build a Solar Panel Box?*

Cut plywood sheet to counterpart the length & breadth necessary for solar cell groups. A group of 36 solar cells of size 3 by 6 inches will be required, plywood sheet that is 0.37 inches broad, 45 inches in length and 24.25 inches in width. Kindly make a note here that similar size solar cells are to be employed in a panel. To this crafted plywood surface attach wooden strips of equivalent length & breath by wooden adhesive & screws. Thereby you are ready with your wooden panel. Now drill some holes in the bottom of the panel this will help in maintaining the equal air pressure outside & inside the wooden panel. This will also help in keeping rain water & dew out of the panel. A perforated hardboard is now required so that it can fit in loosely inside the panel box.

To keep your solar cells safe from rain & dust plexiglass will be an ideal choice. Cut Plexiglass in suitable size as per the panel and keep it aside as it will be used later. Paint your perforated hardboard & plywood with latex paint to shield it from moisture, make sure to paint on both sides.

## *Assembling the Solar Cells:*

Now draw an outline on perforated hardboard each and every solar cell, so that you know where each cell has to be positioned. Now solder each solar cell together so that they can pass current amid each other. Solar cells are very delicate so while soldering have extremely gentle & low wattage. If you exert too much of pressure cells may break. This point is very important to consider, while placing the cells make sure that the space between the two cells are in sync. After soldering the cells, remove it from perforated hardboard. Now it's time to fix these cells on perforated board with the help of glue. For this make use of silicone caulk, avoid placing too much of silicone caulk. Now place the solar cells face-up on the perforated hardboard & wait it gets dry.

After the cells are properly fixed on the perforated board, take the board into sunlight for testing with a voltmeter. If it is functioning as preferred and generating electric current, arrange the perforated board in the wooden panel box by making use of 3 wood screws across the bottom middle and top. Connect electric wires to the solar tabbing at the last part of the circuit and include an obstructing diode in series with it to stop reverse flow of electric current produced to the panel. At the bottom of the wooden panel drill holes so that wires can come out of it. To the end of the wire coming from the panel affix a female plug.

Now once again take the entire panel outside in sunlight for testing. Test the current production via voltmeter. If the circuit is working efficiently then you can affix the plexiglass over the panel with the help of screw and close all gaps (if any) with silicone caulk. All around the external borders of the wooden panel box apply aluminum duct tape or silicone caulk to seal it properly.

## Solar Panel Installation for Home:

1. The primary thing to complete is to make a small solar panel. For domestic purpose, 12 to 16 volts solar panel would be adequate. Make certain that you make the suitable solar panel.
2. After that, you would require a battery. Buy a small rechargeable battery, as it would verify to be the most excellent for domestic usage. You may possibly choose for a 12 volts lead acid battery.
3. The next vital item to buy is a battery box. You will place the solar panel battery in the battery box. The box is particularly vital, when small kids are there at your home. You would desire to shelter them from the battery and the energy it gives out.
4. Now get a hold over a DC meter. Be certain to buy a DC meter that is equivalent the voltage of your solar battery and DC input. The device is exemplary to alter solar energy into electric power.
5. Now, it is the point to begin the installation work of solar panel. Firstly, connect the DC meter & DC input to the battery box top end, by making use of a handheld drill machine.
6. Attach the DC meter to the rechargeable battery, by bringing into play an insulated cable. When doing this, be cautious not to baffle the links. You must attach the primary wire to the negative input. By pursuing the similar course of action, attach the DC inlet & the solar panel to the rechargeable battery.
7. Now, we are all set to bring into use the solar panel, in an effort to alter solar energy into electric power, for your domestic use. For making it usable, you will have to firstly shut the cover of the battery box very firmly, and place the complete panel under direct sunlight.
8. One the installation is done; you will have to linger for approximately eight to ten hours to enjoy the advantages of solar energy.

## *Solar Panel Installation Tips:*

- Make the solar panels as per the fundamental requirement of power, for your dwelling.
- While doing the connections, be clear in your mind to attach the positive and negative ends to their related ends.
- Do make certain to buy a competent DC meter for your solar panel.

## Maintenance of solar panel:

Solar panels are simple to preserve, but they can become extremely hot. Things that come in contact with a solar panel could without doubt explode into fire. At all times keep flammable things far away from your solar panels. Cut down any close by tree twigs — which will also aid in keeping your solar panel out of the shadow and help them to work more efficiently. Keep your solar panels dirt free by washing them or mopping them off with a rug and some liquid cleaner. Rats might chew up electric wires, or the insulation on a wire may be insufficient and liquefy, so observe them cautiously. A bare wire might lead to a blaze. Fix a fuse to defend against short circuits, and do not endeavor to restore a fuse if you don't know what you up too.

**Source:** <http://www.electronicshub.org/solar-panel-installation-and-working/>