

Instruction manual for 8W / 15W / 25W solar lighting system

1. Safety measures and precautions:

- 1.1 Do not use the equipment near flammable or explosive substances or sources of heat
- 1.2 Avoid any contact of system components with water (apart from the solar panel which can be used in rain)
- 1.3 Keep the system out of reach of children

2. Installation and operations:

- 2.1 Position the solar panel outdoors in a location where it will be getting as much bright direct sunlight as possible. Make sure there is no shading – prolonged shading on the solar panel surface will reduce the output significantly. Fix the solar panel to your roof or wall with suitable brackets, timber, clamps, angled frame etc. Alternatively, if your surface is flat (such as a metal roof), bond the solar panel frame to the roof surface with a suitable sealant / adhesive / glue rated for outdoor applications.

Note: Using the solar panel indoors is not recommended even if it is located next to the window with direct sunlight. The charging time will be much longer if the solar panel is positioned indoors.

Use all other system components indoors only, including the system case, switches and LED lights.

- 2.2 Turn the master switch on and then connect the solar panel to the control unit. The battery LED light will switch on. If the solar panel is producing energy, the solar charging LED light will also switch on, indicating that the solar panel started charging the battery.

If it is the first time you are using the system after purchase, charge it from the solar panel until the battery is full. When the battery gets fully charged, the solar LED light changes from red to green.

Depending on the weather conditions, country and season it might take from 1-2 days to 7-10 days to fully charge the battery. When the battery is full, you can start using the system to power LED lights.

- 2.3 The main system control panel:



1. Master switch
2. 12V output switch
3. 12V DC output sockets
4. 5V output USB
5. Solar charging: **green** = battery is full, **red** = charging, **green** and **red** = float charging (final stage of charging)
6. Battery (**green** = ready, **red** = low power)
7. 12V load (**green** = ON)
8. 5V load (**green** = ON)
9. 5V output switch
10. Solar panel input socket

Note: the control panel displayed may look differently for each model

The master switch can be used to activate/deactivate the entire control unit. If the master switch is turned off, everything will be turned off including the charge from the solar panel to the battery. The 12V switch controls the LED lights and allows to switch them on/off collectively all at the same time (the cable of each LED light also has another switch so that each light can be turned on/off individually). The 5V switch controls the USB port, so that connected USB devices like phone chargers can be switched on/off through this 5V switch.

- 2.4 If there is enough voltage from the battery, the 12V load LED will be on (powering the LED light sockets) when you turn the 12V switch on. Plug the LED lights into the front sockets and switch them on/off when needed. When the battery voltage is too low, the 12V load LED indicator will switch off and the battery LED will turn red. Please do not use LED lights or any other loads and charge the unit until the battery is full again.
- Note: when the master switch is in the 'OFF' position, the battery is not being charged even if the solar panel is connected to the control unit. The master switch should be 'ON' to enable charging.**
- 2.5 The control unit has a built-in solar charge controller which prevents over-charging of the battery and stops any reverse current flow from the battery to the solar panel at night. There is no need to disconnect the solar panel in the evening and reconnect in the morning. Leaving the solar panel permanently connected to the system will ensure that the battery is being charged, even in cloudy or low light conditions.
- 2.6 When the built-in battery is fully charged, it will be able to power LED lights for several hours, depending on the temperature, number of previous battery cycles etc. Make sure that you fully charge the battery after intensive use of the system – i.e. keep it charging from the solar panel for several days. The general principle is that the less the battery gets discharged every time you use the system, the longer will be the lifetime of the battery. Avoid situations when the battery gets too low, and let it get fully recharged whenever possible.
- 2.7 The system comes with 3W 12V LED lights (8W or 15W system) or 5W 12V LED lights (25W system). If any additional 12V load is used in conjunction with the LED lights, make sure that the total power consumption is within 25W. Note that the maximum output of the USB port is limited; it might not be enough for fast charging of modern smartphones, and the system will charge them slower than your standard charger.

IMPORTANT:

To avoid the loss of battery capacity and permanent damage of the system, make sure that:

- **When the solar panel is disconnected and the system is not in use for longer than 5 days, the power switch is in the 'OFF' position.**
- **When the system is placed in storage, it is kept at room temperature 15°C – 25°C. Fully recharge the battery using the solar panel at least once every three months.**
- **When the battery is discharged, the system is not left overnight at temperatures below 5°C.**
- **When the battery is fully charged, the system is not left overnight at temperatures below -10°C.**

IF YOU LEAVE THE CONTROL UNIT FOR A LONG PERIOD OF TIME WITHOUT THE SOLAR PANEL CHARGING IT, AND WITH THE MASTER POWER SWITCH ON, THE BATTERY WILL FULLY DISCHARGE AND THE SYSTEM WILL NOT START. RECONNECTION OF THE SOLAR PANEL WILL NOT RECOVER THE SYSTEM EITHER. ONLY A QUALIFIED ELECTRICIAN WILL BE ABLE TO REMOVE THE BATTERY FROM THE SYSTEM AND CHARGE IT BY OTHER MEANS, SUCH AS A SUITABLE MAINS CHARGER.

3. Troubleshooting

- 3.1 Charging LED indicator is off: Please check whether the solar panel is facing the sun and it is properly connected to the control unit; inspect the solar cable and connector for potential damages or short circuits (if possible, open the black connection box at the back of the solar panel to examine the connections); check whether the master switch of the control unit is on.
- 3.2 The battery LED is not working: Use a multimeter to test the DC output. If there is no voltage, the battery may have been drained or the controller module may be at fault. An electrician may need to open the case of the unit to check the battery voltage. If there is no output voltage from DC output but the battery voltage is normal (above 12.0V), the connection cable or the controller might be damaged – in this case the product needs to be repaired. If the battery voltage is too low, it might need to be recharged by other means first. If the multimeter is not registering any voltage at the battery terminals, the battery might need to be replaced.
- 3.3 No load output and the 12V load indicator is off, but the battery LED is red: Most likely the battery is discharged. Please disconnect all the lights, turn the load switches off and charge the battery from the solar panel until full (this may take from several hours in bright summer weather to 7-10 days in the winter depending on location).

- 3.4 One of the LED lights cannot be switched on, but the other LED lights work well: This might be a problem with the light bulb itself or the cable / switch / light bulb holder. Please swap the light bulb with a working light bulb to check if the cable / switch / and the light bulb holder for the LED light which didn't work has now started working. If the LED bulb was faulty, please replace it. If this did not solve the problem, please seek further assistance.
- 3.5 The LED lights switch on only for a short period of time, and then switch off: This is an overdischarge protection of the system. Your battery is very low, and the system prevents further discharge to avoid a damage to the battery. Disconnect all LED lights cables, turn the load switches off and leave the unit to charge from the solar panel until the battery is full (this might take from a few hours in the summer to several days in the winter depending on the country).
- 3.6 The USB port doesn't work for my laptop / tablet / large smartphone: Note that the current of the USB port is limited, so it might not be suitable for powerful devices.
- 3.7 The battery discharging time is shorter than normal: After continuous use, especially if the battery is not regularly recharged, the total energy storage capacity may shrink and the battery may need to be replaced.
- 3.8 I am having difficulties trying to screw the light bulb into the plastic light bulb holder: This happens occasionally with some light bulb holders when they are made for a tight fit. Find the point on the light bulb where the thread spiral starts, and make sure it touches the corresponding point on the light bulb holder where the internal tread spiral starts. Make sure you keep the light bulb perfectly straight in relation to the holder, then gently push the light bulb in, rotating it at the same time. If the light bulb changes the angle or tilts to the side as you screw it in, it didn't catch the thread correctly. In such case unscrew it and start again.

4. Specifications

| Solar lighting system | 8W (SL-8W) | 15W (SL-15W) | 25W (SL-25W) |
|-------------------------|---------------------|-------------------|--------------------|
| Rated charging current | 3A | 3A | 3A |
| Rated discharge current | 2A | 2A | 3A |
| Rated working voltage | 12V | 12V | 12V |
| Float charge voltage | 14V | 14V | 14V |
| Battery | Lead acid 12V 4.5Ah | Lead acid 12V 7Ah | Lead acid 12V 12Ah |
| USB output | 500 mA | 500 mA | 800 mA |
| Working temperature | 5°C - 40°C | 5°C - 40°C | 5°C - 40°C |
| Storage temperature | 15°C - 25°C | 15°C - 25°C | 15°C - 25°C |
| Solar panel voltage | 18V | 18V | 18V |
| Low-voltage protection | 10.8V | 10.8V | 10.8V |
| No-load loss | ≤8mA | ≤8mA | ≤8mA |

| System components | 8W (SL-8W) | 15W (SL-15W) | 25W (SL-25W) |
|---------------------------------------|------------|--------------|--------------|
| Solar panel (with 10m cable, DC plug) | 1 x 8W 18V | 1 x 15W 18V | 1 x 25W 18V |
| LED lights (with 5m cable, DC plug) | 2 x 3W 12V | 4 x 3W 12V | 4 x 5W 12V |
| Control unit with battery | 1 | 1 | 1 |
| USB adapter for mobile phones | 1 | 1 | 1 |