GEO
SOLAR LIGHTING KITS™



Please read all instructions carefully before any installation work begins.

Please observe correct polarity at all times: Positive = Red; Negative = Black.

Preparing your cables
Throughout these instructions there is reference to preparing your cables; a prepared cable is where 5cm's (2 inches) of outer insulation has been removed from the end of the wire and 1cm (¼ inch) is removed from the end of the inner insulation on the positive and negative strands exposing the inner wire.




Step 1 – Position your battery, panel, light switch and bulb holders.

When positioning your light switch(a), panel(b), battery(c) and bulb holders(d) bear in mind the run of cable between each.

(a) The light switch you will typically require to be in the immediate entrance to your out building
(b) The Panel is best situated in a southerly direction angled at 30-45 degrees however if this is not possible then mounted flat on the roof facing the sky will be fine. Avoid shaded areas.

(c) The battery should be positioned where it wont be disturbed somewhere between the Panel and Switch. The shorter the run of cable between the panel and the battery the more efficient the system will be.
(d) Loosely fit the bulb holders in the desired position.




Step 2 – Preparing your cable runs

With all your components loosely in place you can now prepare your cable lengths to connect each component. TIP: With each run of cable allow 30cm (12inches) extra – it is easier to hide excess cable than it is to extend a piece which has been cut short.

The cable runs you will require are:-
i. Solar Panel to Battery
ii. Battery to Light Switch
iii. Light Switch to 1st Bulb Holder
iv. 1st bulb holder to 2nd bulb holder etc
With the GEO 3 and 4
v. Battery to Charge Controller


Step 3 – Connecting the light switch

i. Knock out the thin section of the back box to allow the cable to be fed through.
ii. Source your run of cable to go between the battery and switch
iii. Feed the cable through and prepare the end of the cable.
iv. Fix the connection block to the negative wire
v. Fix the positive wire into the switch
vi. Prepare the opposite end of the cable ready to connect to the battery.
vii. Source your cable to go between the switch and the 1st bulb holder.
viii. Repeat steps (iv) – (vi)
ix. Prepare the opposite end of the cable ready to connect to bulb holder.




Step 4 – Connecting your bulb holders

i. Remove bulb holder from ceiling to make it easy to connect wires
ii. Connect the ring clips to the positive and negative wire from the switch
iii. Fix the negative to the terminal that connects to the bottom of the bulb
iv. Fix the positive to the terminal that connects to the side of the bulb

Step 5 – Connect additional bulb holders

i. Source the cable run for going between bulb holders.
ii. Prepare both ends of the cable.
iii. Connect ring terminals to positive and negative wire on both ends of the cable.
iv. Connect one end of the cable to the 1st bulb holder negative to negative and positive to positive.
v. Connect the other end to your second bulb holder.




Step 6 – Connecting your solar panel

i. Source your cable run to go between the solar panel and the battery
ii. Prepare the end of the cable closest to the panel
iii. Remove the plastic cover on the terminal block on the back of the panel
iv. Remove metal clip
v. Position cable in place and secure with metal clip
vi. Connect positive wire to positive terminal and hold in place with screw
vii. Connect negative wire to negative terminal and hold in place with screw




Step 7 – Fixing your Solar Panel In Place

i. Lay the panel upside down in the location you wish to fix it
ii. Mark your roof inline with the holes on the panel frame
iii. Screw the black plastic panel holders in place.
iv. Remove the black plastic panel holder and apply silicon to the screw hole
v. Reattach the black plastic panel holder
vi. Attach the Panel to the black plastic panel holders with the supplied cable ties.




Step 8 – Fixing your in-line fuse

i. When preparing the panel cable to connect to the battery, instead of removing 5cms (2inches) of the outer insulation, remove 15cm's (6inches).
ii. Cut the positive wire in half and prepare the cable either side of the cut
iii. Unscrew the fuse holder and connect these positive wires either side of the fuse

Step 9 – Installing a charge controller

i. Fix the charge controller to the wall close to the battery – make sure you have enough room to connect the system wires into the unit.

Step 10 – Connecting the system

GEO 1 and 2

i. Twist the negative wire from the solar panel and the negative wire from the light switch together and fit the spade connector or croco-dile clip (depending on the battery you are using) to the end.

ii. Twist the positive wire from the solar panel and the positive wire from the light switch together and fit the spade connector or croco-dile clip (depending on the battery you are using) to the end.

iii. Connect both clips to your battery.

GEO 3 and 4

i. Source your cable for going between the controller and the battery
ii. Prepare both ends of the cable
iii. Connect positive and negative wires from one end of the cable into the charge controller terminals 3 and 4.
iv. Fix spade connectors to positive and negative wires on the other end of the cable and con-nect to battery.
v. The load light and battery light should now be lit.
vi. Connect positive and negative wires from light switch into charge controller terminals 5 & 6.
vii. Connect positive and negative wires from solar panel into terminals 1 and 2.
viii. The charge light should now be lit.

Step 11 – Testing your system.

Screw the LED Bulbs into the bulb holders
i. Turn light switch on
ii. Your lights should now light up
iii. If your lights don't light up check that you have the positive and negative connections on the holders the correct way round.
iv. If lights do light up remove bulbs and put safely to one side.
v. Fix the bulb holders to the ceiling.
vi. Screw your bulbs back into place
vii. Turn switch on to do a final check




Step 12 – Tidy Wires

i. Go around your installation securing the wires with the supplied cable clips

Congratulations you now have off grid mains equivalent lighting!

These systems if installed correctly, with the panel in an unobstructed location, are designed to generate enough energy on a typical UK winters day to give 3 hours of light per night. At other times of year you should have as much light as needed.

Further Expansion of System

These system are designed to be modular which mean you can add more switches, bulbs or power to the the system at any time.
Should you wish to add a facility to power electrical devices from your GEO KIT then an inverter can be added but the power drain from the appliances will need to be taken into account. Potentially further panels and more powerful charge controllers may be required.