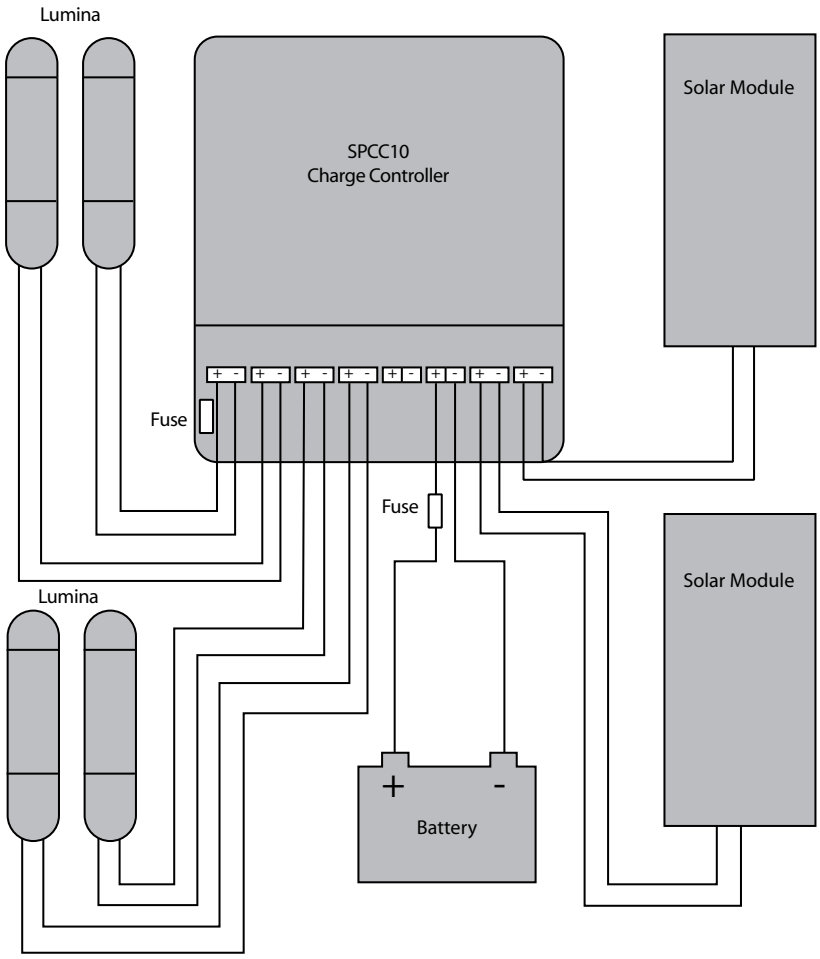
Sollatek

SLK4

SOLAR LIGHTING KIT

Installation Manual for Solar Lighting Kit



Installation Manual for Solar Lighting Kit

Please unpack your kit carefully. Check and identify all the components as follows.

Kit Contents:

Description	Qty	Stock Number
Solar module SP20	2	9SPS0020
Lumina light fitting	4	96321200
Fluorescent lamp 9W	4	68509807/01
Solar charge controller, SPCC10, 12V	1	94100000
Cable 50m, c/w solar module connectors fitted	1	63132609
Battery cable with fuse and croc clips, 2m	1	9K000050
Cable tie	10	63910177
Solar module mounting bracket	8	73230608
Phillips screwdriver	1	GSLK1610
Slotted screwdriver	1	GSLK2610
Wire stripper	1	GSLK0610
Cable clips	50	63915609
15A spare fuse	2	61315291/01
Coach screw (bracket to wall)	8	79081712
Bolt M5 12mm (bracket to solar module)	8	79054310
Nut M5	8	79150659
Shake proof washer	8	79350676

Solar Charge Controller SPCC10
x1

Lumina light fitting
x4

Fluorescent lamp 9W
x4

Solar module SP20
x2

Coach screw
x8

Bolt M5 12mm
x8

Nut M5
x8

Shake proof washer
x8

Cable clip
x50

Cable tie
x10

Battery cable with fuse and croc clips
x1

Slotted screwdriver
x1

Phillips screwdriver
x1

Spare fuse
x2

Wire stripper
x1

Solar module mounting bracket
x8

Cable 50m
x1

SAFETY WARNING:

- Take great care when handling the battery.
- Do not short-circuit the battery terminals with any wire, tool, necklace or watch strap etc.
- Avoid sparks near the battery as it may cause the battery to explode.
- Beware of acid from the battery, which can burn skin and clothes.
- Wash your hands thoroughly after touching the battery.
- Do not eat, drink or smoke near the battery.
- Use the battery in a well-ventilated area and never use it in a sealed container.

Important Notes.

- Follow the correct sequence of the connection procedure below so as to avoid damage to system components and to avoid sparks while connections are made.
- If a battery is used which requires you to add acid, follow the battery manufacturers instructions carefully.
- The cable supplied has two special connectors already fitted to it, one each end. Do not cut them off. These are for connection to the solar modules. For this reason, run the solar module cables to the charge controller as the first cable run. However, do not connect them to the charge controller until the battery and lights are connected. It is suggested you run the cables to the modules but leave the cables unplugged from the solar modules until last.

1) Battery Selection.

a) The SKL4 is not supplied with a battery and so this will need to be purchased separately. It must be a 12V, lead-acid type. It is recommended that you use a good quality deep discharge solar battery of between 36Ahr to 90Ahr (amp per hour).
If a solar battery is not available, then a recreation battery could be used but you should choose one of approximately twice the Ahr rating. If no better alternatives are available, then a vehicle/truck battery could be used but it should be 4 times the recommended Ahr rating, ie a minimum of 150Ahr, otherwise battery life and system performance will be reduced.

b) A 'sealed' valve regulated battery is a good option. Gel and AGM types are also good. If, however, a flooded type is used, then regular topping up with de-ionised water (available from auto suppliers) will be necessary.

c) Recommended Sollatek batteries are:
i) SFGM36-12, 12V, VRLA, 36Ahr
ii) SFGM48-12, 12V, VRLA, 48Ahr
iii) SFGM57-12, 12V, VRLA, 57Ahr
For more information on batteries log on to www.sollatek.com

d) A larger 12V battery can be used to give longer running time provided there is enough sunlight available during the day to charge it.

2) Component Positioning.

Decide upon the position of each of the system components around the building, taking into consideration the following points:

a) The **Solar module** should be placed outside in direct sunlight away from shade (e.g. tree, building etc…); south facing in the northern hemisphere or north facing in the southern hemisphere. Remember that shade will move as the sun moves at different times of the day. Position it so that it will not get damaged by animals or vehicles and to reduce the chance of theft. Refer to the centre section of this booklet for the correct tilt angle.

b) Position the **battery and charge controller** around the centre of the system so as to keep cable runs short and improve system performance.

c) The cable between the **battery and charge controller** should be kept short, preferably less than 2 meters.

d) The cable between the **solar modules and the charge controller** should also be kept fairly short if possible, preferably less than 2meters.

e) Sollatek recommends that the **Luminas** are installed just above eye level and easy to reach, in order to operate the light switch on each Lumina. Keep the cables as short as possible to achieve maximum power.

3) Mounting Instructions.

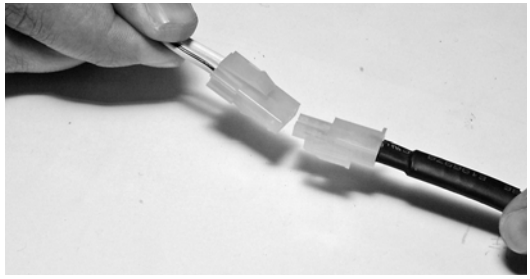


Figure 1: *Checking cable length between SPCC10 and the Solar Module*

a) Mounting the solar module.

i) Ensure you can connect the cable to the back of each module before finally fixing them (***Figure 1)***.

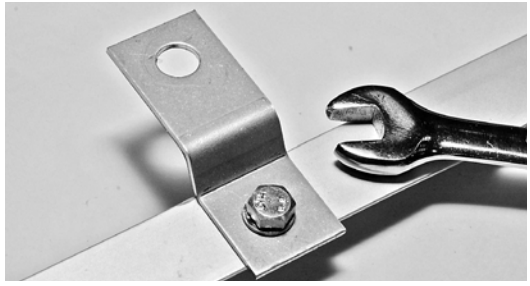


Figure 2: *Fixing the mounting bracket to the Solar module*

ii) Mount the x8 brackets to the x2 solar modules by using the Bolt M5, Nuts M5 and shake proof washer (***Figure 2)***.

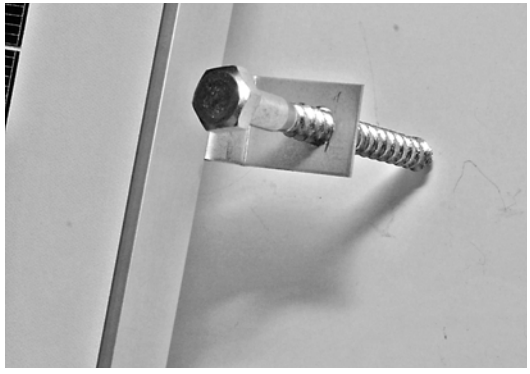


Figure 3: *Fixing the solar module to the ceiling using the supplied coach screw*

iii) Mount the solar modules on the roof or wall (refer to Appendix 1) using the coach screw (***Figure 3)***.

iv) Ensure there is free air movement behind the modules to give good ventilation, so that they don't get too hot in the sun. This is especially important when mounted on metal roofs.

v) Ensure the dark, patented surface faces the sun and the face with the cable is behind.

vi) Tilt the modules directly north or south towards the equator as described in section 2a. Tilt the modules at an angle from the flat position, depending where you are in the world. Appendix 1 is a useful page you can tear out and use to check the angle. Generally speaking, countries on the same latitude (distance from the equator) will use the same tilt angle.

vii) Make sure the modules are secure to withstand high winds.

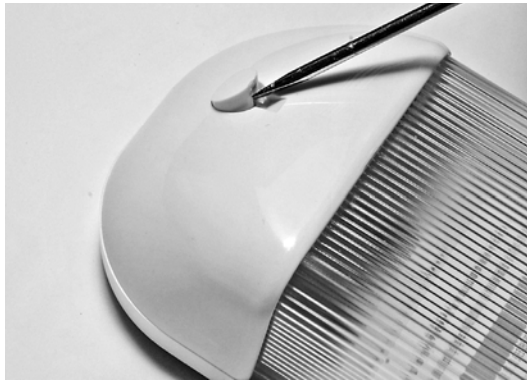


Figure 4: *Removing of Lumina screw cap*

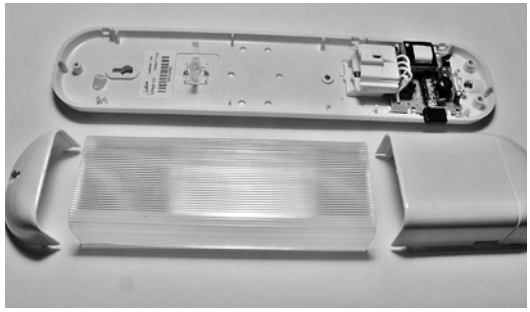


Figure 5: *Disassembly of the Lumina light fitting*

b) Mounting the Lumina light fittings (load).

i) Remove both end covers, the diffuser and the lamp, if fitted (***Figure 4 & 5)***.

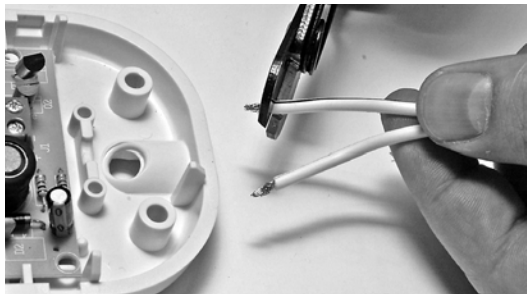


Figure 6: *Stripping of cable for connection to the Lumina*

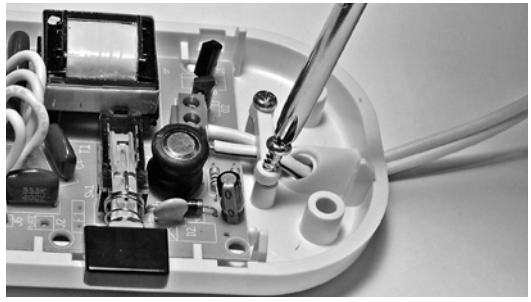


Figure 7: *Fixing the cable to the Luminax*

ii) Strip 5mm of insulation from the cable. Feed the cable through the entry hole in the base and connect to the terminal block marked + and - observing correct polarity. (white/black to'+', white to '-'). Fit the cable clamp with the two small screws provided with the Lumina (***Figure 6 &7)***

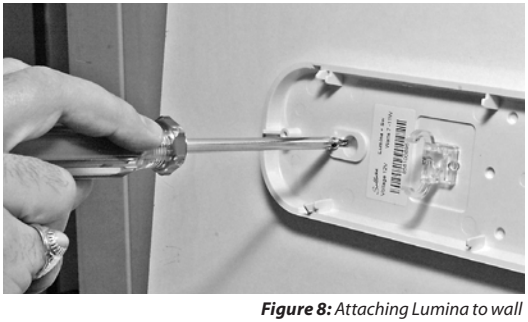


Figure 8: *Attaching Lumina to wall*

iii) Replace the large end cover over the electronics and secure to the base using two screws supplied.

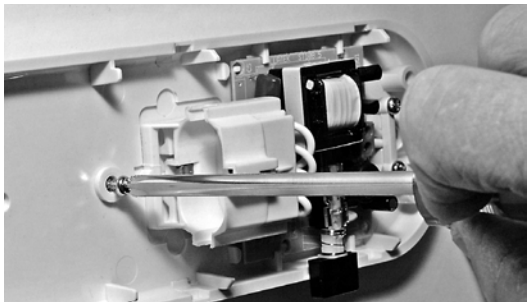


Figure 8: *Attaching Lumina to wall*

iv) Using a further two screws (supplied), attach the light to the wall or ceiling as required (***Figure 8)***.

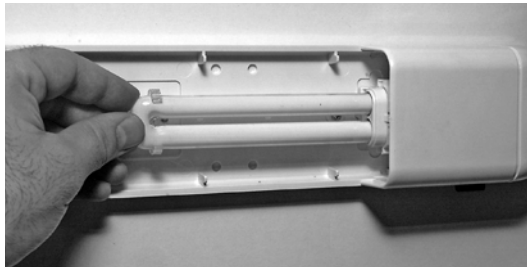


Figure 9: *Lamp insertion*

v) Insert the lamp until it clicks into place (***Figure 9)***.

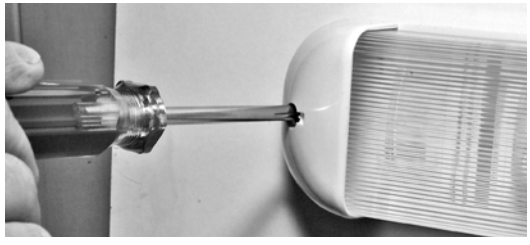
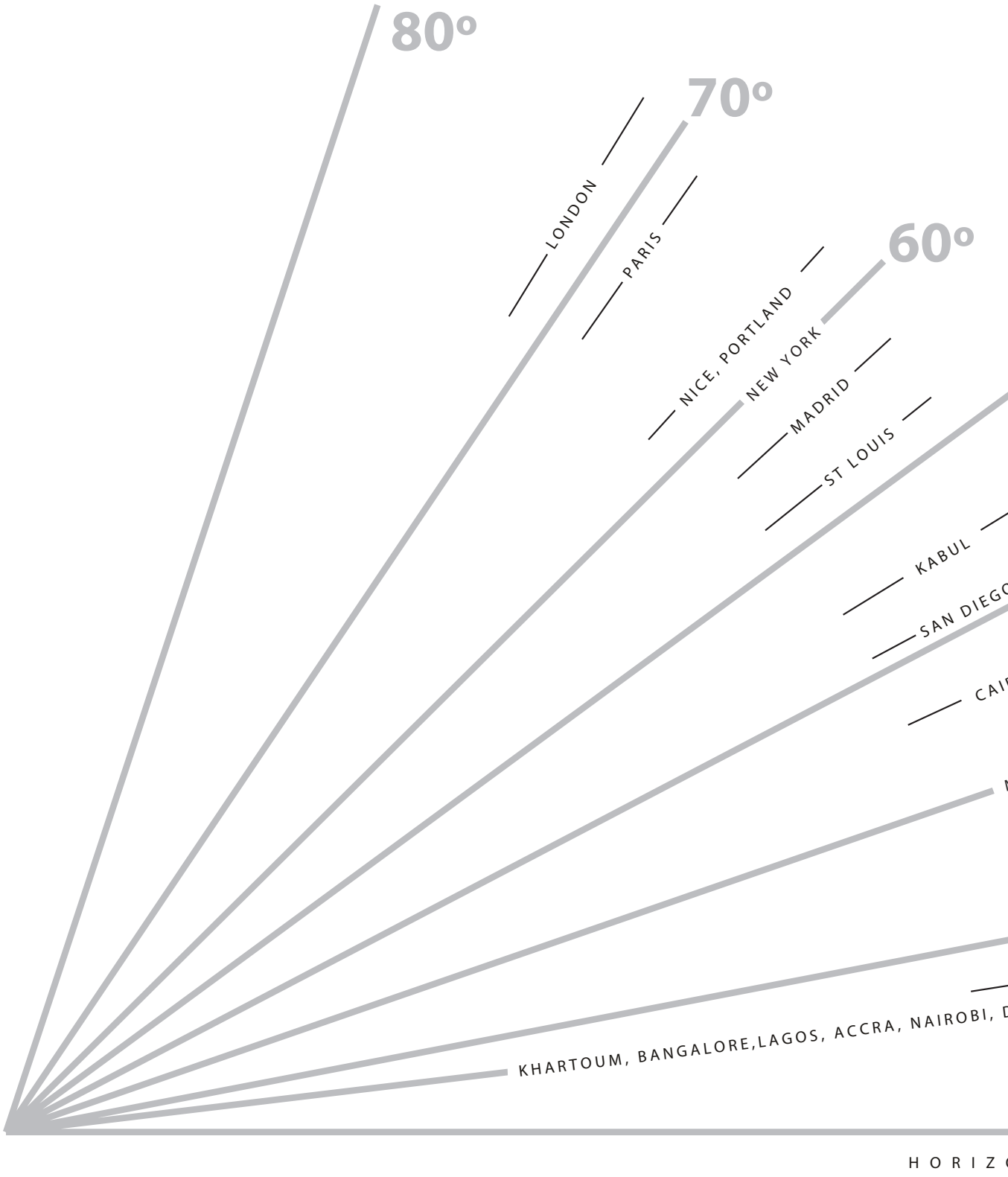
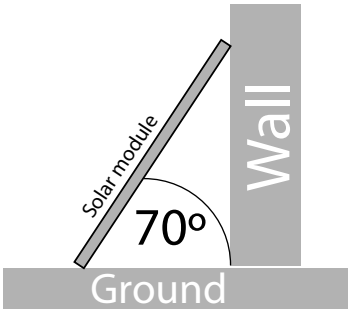


Figure 10: *Closing the Lumina cap*

vi) Slide on the clear lens (diffuser) and attach the small end cover to complete the installation (***Figure 10)***.

vii) Safety
Although the standard Lumina light is designed to operate from an input voltage of 12 VDC, much higher AC voltages are present on the internal circuit board and at the lamp socket during operation, and so due care should be taken. The Lamps contain mercury vapour, which could be harmful if the lamp is broken and the gases inhaled. Due care and attention should be taken when disposing of expired lamps.


80°
70°
60°
LONDON
PARIS
NICE, PORTLAND
NEW YORK
MADRID
ST LOUIS
KABUL
SAN DIEGO
KHARTOUM, BANGALORE,LAGOS, ACCRA, NAIROBI,

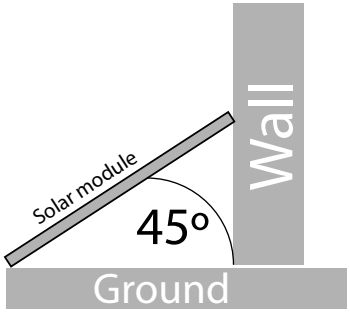


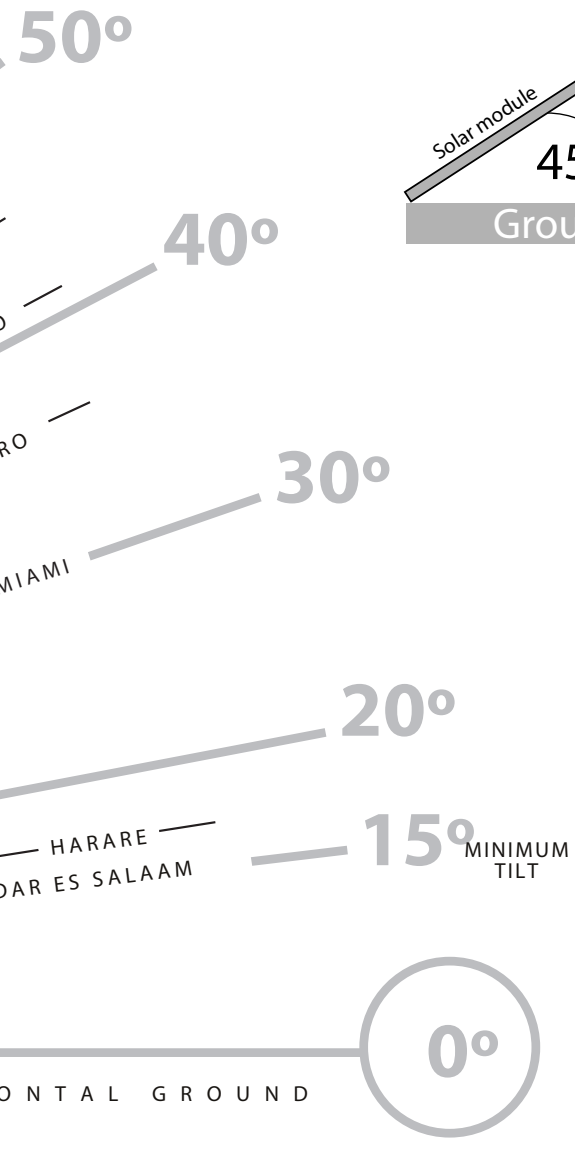
Appendix 1. solar module tilt angle.

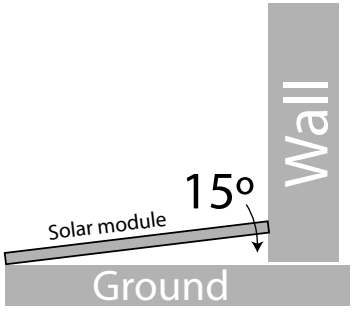
Angle of solar module from the ground

If in the northern hemisphere: face your panel directly south.

If in the southern hemisphere: face your panel directly north.







c) Mounting the SPCC10 charge controller.

i) The controller should be as close to the battery as possible in a well-ventilated area and away from direct sunlight.However, do not mount it directly above the battery as acid fumes can damage a charge controller.

ii) Leave space (10 cm minimum) to the right of the controller for air to circulate round the black heat sink.

iii) Remove the lower plastic cover from the SPCC10 by removing the screw caps and the two screws. Mount the SPCC10 onto a flat, vertical surface with the cable glands facing the floor.

Figure 11: *Fixing the SPCC10 to the wall*

iv) Insert one screw into the wall upon which to hang the controller (on the upper hole). After this, insert mounting screws into the two lower holes in the bottom section of the SPCC10 (***Figure 11)***.

d) Mounting the battery.

i) The battery should be kept off the ground, preferably on wood.

ii) Avoid short circuits from contact with metal objects/ tools.

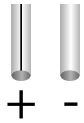
iii) The battery should be positioned in a cool, dry place.

iv) Allow good ventilation and never place in a sealed container.

v) Avoid sparks and naked flames near the battery as it may explode.

vi) Keep the battery terminals clean. A small amount of petroleum jelly smeared over the terminals will help reduce corrosion.

4) System connection.



a) Observe correct <u>polarity</u> throughout the system - connect negative to negative and positive to positive.

b) The cable supplied with the lighting kit is coloured white and white/black. Use the <u>white for the negative</u> connections and the white/black for the positive connection. Do this throughout the system.

c) The cable supplied has two <u>special connectors</u> already fitted to it, one each end. Do not cut them off. These are for connection to the solar modules. For this reason, run the solar module cables to the charge controller as the first cable run. However, do not connect them to the charge controller until the battery and lights are connected. It is suggested you run the cables to the modules but leave the cables unplugged from the solar modules until last, to avoid sparks and damage.

d) When running cables, make sure they will <u>not get damaged</u> by sharp edges, doors closing, people stepping on them, animals, etc. Try to keep them up high where possible. Also be careful they will not trip people up.

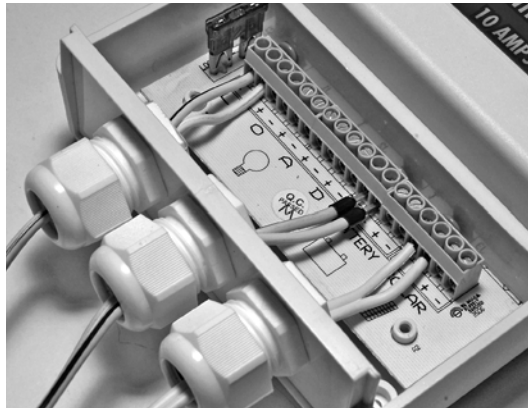


Figure 12: *SPCC10 connectivity*

e) Connect the <u>Lumina</u> lights (load) by cable to the SPCC10 through the left hand cable gland. The cables should have been stripped of 8mm of insulation and inserted into the terminals, observing the correct polarity. (white / black is positive "+", white is negative "-") (***Figure 12)***.

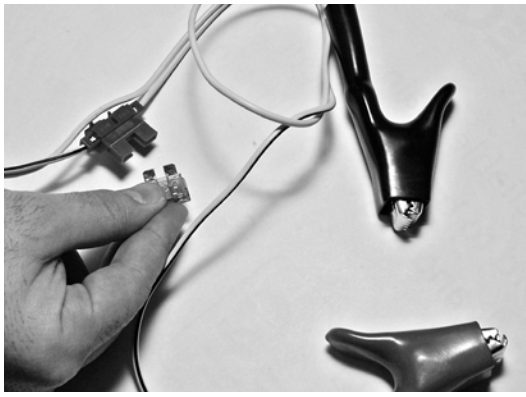


Figure 13: *Removing of battery cable fuse before connectivity*

f) Remove the fuse from the ready-assembled battery cable before connection. Connect the battery cable to the charge controller, then to the battery. The red clip goes on the red/positive terminal of the battery, the black clip on the negative (***Figure 13)***.

g) Connect the solar module's cable into the charge controller but do not connect the plugs on the rear of the solar modules yet. (Alternatively, cover the solar modules with a blanket to prevent them generating power).

h) Ensure all the wiring is secure using the cable clips and cable ties provided.

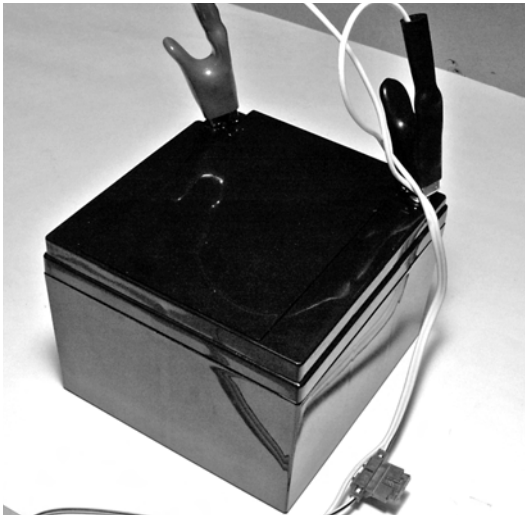


Figure 14: *Battery connectivity*

i) Power up the system by fitting the fuse in the battery cable (***Figure 14)***.

j) Check the SPCC10 charge controller, one of the LEDs should be lit.

k) Turn on each of the Lumina lights and check they all work.

l) Turn off all the Luminas. Plug in the cables at the back of the solar modules (or remove the blanket covering them). This will now charge the battery during the day.

m) It is highly recommended that you leave the system with the lights off and charging the battery from the solar modules until the battery is fully charged. The state of charge is indicated by the LEDs on the SPCC10 charge controller. Once the 'Full' LED lights, the system can then be used by turning on the lights.

n) The charge controller will protect the battery from over-charging by automatically disconnecting the solar modules when the battery is full. It will automatically reconnect them as the charge gets used again.

o) The charge controller will automatically protect the battery from over-discharge by disconnecting the lights if the battery gets too low. If this happens, you can as an emergency, turn off all the lights, wait a short while and press the reset button on the SPCC10. You may then be able to turn on one light for a few minutes longer.

p) If you find the lights go off sooner than you want, you should consider saving power by only turning them on when needed. If you still have a problem, consult the troubleshooting guide overleaf.

5) Troubleshooting

Symptom	Cause	Solution
Lamp not operating	Incorrect input voltage Blown fuse Dead or broken lamp Reverse polarity connection Switch not turned on Charge controller off (Red LED) Damaged cable from charge controller Output fuse blown	Check input voltage Establish cause and replace fuse Replace lamp Rewire, noting + and – Turn on Lumina switch Allow battery to charge next day Check and repair cable Check fuse inside SPCC10
Dim lamp	Incorrect voltage input Incorrect lamp wattage Lamp not securely fitted Bad electrical connection Old lamp	Check voltage Replace with correct lamp Fit correctly Check wiring for faults Replace lamp
Flickering tube	Bad electrical connection Lamp not securely fitted Lamp at end of life	Check wiring for faults Fit correctly Replace lamp
Battery doesn't charge	Solar modules not properly connected Wrong polarity on solar modules Solar modules shaded from the sun	Check module connections. Ensure that polarities are correct Re-position solar modules
Battery status LEDs do not illuminate	Battery incorrectly installed. Battery fuse blown Battery wiring fault Battery acid is very low (wet batteries only) Battery is dead	Check battery cables and polarit. Check battery fuse Check battery wiring for problems Fill the battery cells with distilled water Replace
Internal load fuse blows (15Amp)	Short circuit in the load Load is drawing too much current	Find and repair short circuit Reduce load size
Rapid on/off operation of relays (chattering)	Voltage thresholds have been set incorrectly Battery is significantly undersized Solar modules working but battery fuse blown	Adjust thresholds to limits indicated in these instructions Increase number or capacity of battery Replace battery fuse
Incorrect system operation	System needs re setting.	Press reset button on SPCC10
System shuts down too soon	Too much load Poor connection Solar module dirty/damaged	Don't turn lights on so much Clean/check connections esp on battery Clean/replace solar module

Number of hours the Lamps will run in various locations around the world using a standard 36Ahr 12V solar flat plate gel battery and 2 x 20WATT modules

Number of Luminas	East Africa	West Africa	North Africa	South Africa	Central Europe	Southern Europe
	18-29 hours	25-30 hours	25-30 hours	27-30 hours	8-22 hours	13-22 hours
	9-15 hours	12-16 hours	12-16 hours	13-16 hours	4-11 hours	7-11 hours
	6-9 hours	8-10 hours	8-10 hours	9-10 hours	3-8 hours	5-7 hours
	5-7 hours	6-8 hours	6-8 hours	7-8 hours	2-6 hours	3-5 hours

These figures show a range from worst month in year for sunshine and best month. For example in West Africa you can expect to run 4 Luminas for up to 8 hours in summer and 6 hours in winter months.

These figures assume the battery is in good condition and the installation has been carried out correctly.
It also assumes the Solar module installation and tilt angle is correct and is exposed to sunshine most of the day without any obstacles.

Sollatek (UK) Ltd
Unit 10 Poyle 14 Newlands drive,
Poyle, Slough SL3 0DX, U K.

Tel:
International: +44 1753 688300
National: 01753 688300

Fax:
International: +44 1753 685306
National: 01753 685306

E-mail:
sales@sollatek.com

Internet:
www.sollatek.com

2 YEARS WORLDWIDE WARRANTY
ON ALL SOLLATEK PRODUCTS

Sollatek provides you with full back up support and a two year worldwide warranty on all products, with local support in over twenty countries worldwide.

Sollatek™
solar systems

www.sollatek.com

PROVIDING CLEAN RELIABLE POWER WORLDWIDE

ISO9001: 2000 accredited company

All weights and dimensions are approximate. Specifications are subject to change without prior notice.

TWO YEAR WORLDWIDE WARRANTY
(subject to terms and conditions).

SLK4 user manual Nov 08
Artwork ID: 10910037
Stock code: 74137830