USER'S GUIDE

LEONICS®

SOLAR OBSTRUCTION LIGHT SYSTEM

Authorized Distributor

LEO ELECTRONICS CO., LTD.

119/50-51 Moo 8, Bangna-Trad Rd., Bangna, Bangna, Bangkok 10260 THAILAND

Tel. 66-2746-9500, 0-2746-8708 Fax. 66-2746-8712

● www.leonics.co.th ● www.leonics.com ●

● e-mail : global_business@leonics.com ●

LEN.MAN.OLC.091 Rev.2.00/2006

CONTENT

SAFETY INSTRUCTIONS

Please read and follow this user's guide carefully and completely.

Important: Please keep this user's guide for reference in order to use SOLAR OBSTRUCTION LIGHT SYSTEM properly and safely. This user's guide contains safety instructions, introduction, installation, testing operation, operation and data setting and troubleshooting.

If SOLAR OBSTRUCTION LIGHT SYSTEM does not operate properly, please contact us, nearest LEONICS service center for assistance, send e-mail to support@leonics.com, or visit us at www.leonics.com.

To help you much more quickly when contact us, please record the following information:

Model : _____

Serial Number : _____

Purchased date : _____

Purchased from : _____

CAUTION

Do not disassemble SOLAR OBSTRUCTION LIGHT SYSTEM to repair or maintenance. Inside consists of complicated electronics parts, which cannot be serviced by owner and has high electricity, which causes death. Please contact us or our nearest service center for service maintenance or repair.

1.1 Safety instruction for installing

1.1.1 Read this user's guide and its accessories user's guide carefully before installation.

1.1.2 To reduce risk for electric shock, use insulated tools during installation.

1.1.3 Recommend to connect SOLAR OBSTRUCTION LIGHT SYSTEM to ground system.

1.1.4 Do not wear ornaments e.g. rings, necklaces, etc. during installation.

1.1.5 DO NOT place any things on the top of unit.

1.1.6 If you have to keep SOLAR OBSTRUCTION LIGHT SYSTEM, recommend keeping in dry area. (Proper temperature should be between -10˚C and 50˚C.)

1.1.7 Do not remove the dome of obstruction lamp.
1.1.8 Avoid impact to solar panel or scratch on its surface glass.

1.2 Safety for Batteries

1.2.1 Do not place the battery near or in fire.
1.2.2 Do not short battery terminals.
1.2.3 Do not disassemble or reassemble the battery
1.2.4 Batteries should be installed in a well ventilated area.
1.2.5 Always verify correct polarity of batteries before connecting to an equipment.
1.2.6 In the event of exposure to battery electrolyte, wash the area with soap and water. If acid enters the eyes, flood them with running cold water and get immediate medical attention.
1.2.7 After discharging the battery, recharge it as soon as possible.
1.2.8 The battery must be recycled properly. Please contact your local recycling center for proper disposal information.

1.3 Safety for PV array

1.3.1 Follow instructions and cautions of PV module before installation.
1.3.2 Avoid impact to PV module or scratch on its surface glass.

INTRODUCTION

2.1 General

SOLAR OBSTRUCTION LIGHT SYSTEM consists of obstruction lamp, solar panel, charge controller and battery in the same enclosure. The obstruction lamp operate by solar energy which designed for obstruction light complied with the ICAO[1] standards and recommended practices design types A & B, which used for remote, night time and hazardous obstacle of marking of tall structures such as buildings and telecommunication masts are higher than 45 metres.

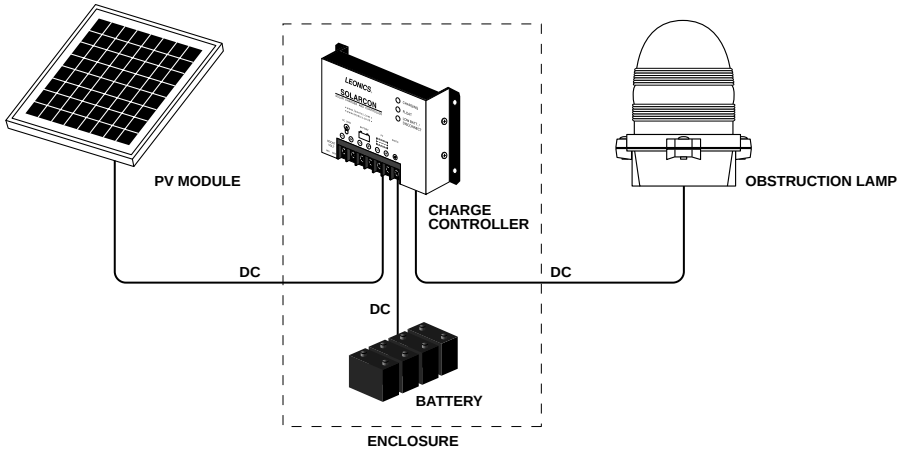
The obstruction light is developed to replace incandescent lamp by using the Ultra LED technology that consumes low power (~ 5 watt) with approximate 100,000 hours lifespan. By using 8-bit microprocessor, the obstruction light controller with charge controller can control the obstruction lamp in 2 pattern mode and high efficiency battery charging.

[1] Internatinal Civil Aviation Organization Standard and Recommend Pratices: Aerodromes Annex 14-Volume 1, 3rd Edition, July 1999, Chapter 6.

2.2 Features

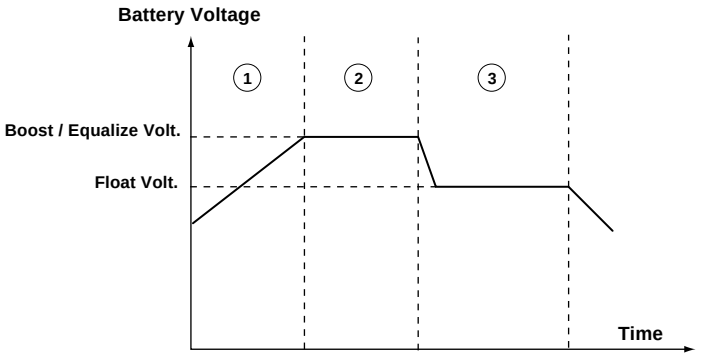
- Advanced microprocessor control with 3 stage charging
- Automatic ON-OFF obstruction lamp
- Over charge and over discharge protection
- Low battery shutdown with alarm
- Use the obstruction lamp same as normal type with long life time MTBF more than 100,000 hours
- Polycarbonate dome with lens (ASTM : UV stabilized)
- Die-cast aluminium housing with yellow polyester powder coated
- Protection class typical IP65
- Good for remoted area or the area that could not find electrical supply

2.3 Operation



This system is controlled by the charge controller that control charging current from solar panel to storage battery and supply to obstruction lamp at night or when insufficient sunlight for 30 minutes.

2.4 The 3 Step Charging Characteristic



2.4.1 STEP 1 : BULK CHARGE STEP

Battery will be charged at maximum current until reaching boost voltage charge, then charging characteristic will charge to step 2. Bulk charge will occured on next sunny day.

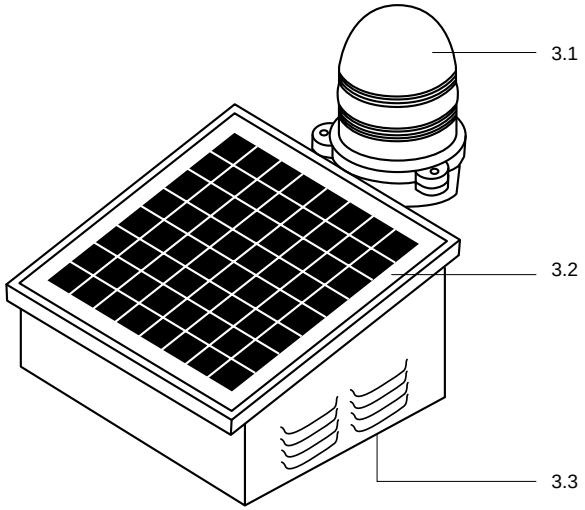
2.4.2 STEP 2 : BOOST CHARGE STEP

Battery will be charged at a higher charging voltage and enable charge in the battery to be nearly 100%. During boost charge, the charging voltage will be regulated for about 2 hours then change to step 3.

2.4.3 STEP 3 : FLOAT CHARGE STEP

Battery will be kept fully charge by float charge level until finish of day.

SOLAR OBSTRUCTION LIGHT SYSTEM PARTS



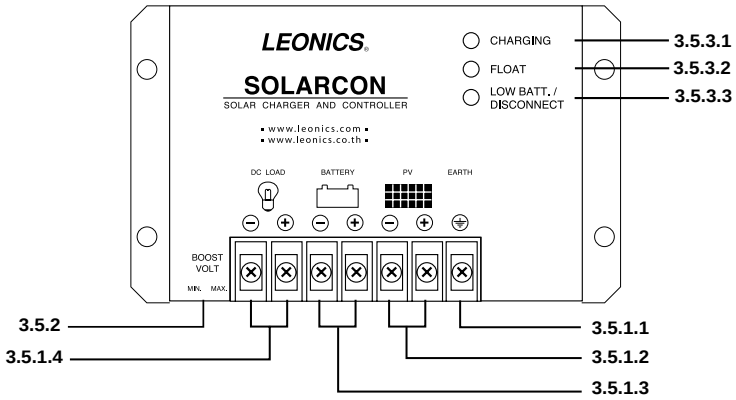
3.1 Obstruction lamp

3.2 Solar photovoltaic module : The 12 Vdc solar photovoltaic module.

3.3 Holes : For mounting to the wall.

3.4 Battery : The battery is in the enclosure.

3.5 Charge controller : The charge controller is in the enclosure that use for control charging battery.



3.5.1 Terminal

3.5.1.1 Earth terminal : The terminal for connecting to ground system.
3.5.1.2 PV terminal : The terminal for connecting to PV module.
3.5.1.3 Battery terminal : The terminal for connecting to battery
3.5.1.4 DC load terminal : The terminal for connecting to obstruction lamp.

3.5.2 Boost voltage : Adjustable voltage for variable boost voltage level to charge batteries.

3.5.3 Indicator lights

3.5.3.1 CHARGING : Indicated the charge controller is charging battery.
3.5.3.2 FLOAT : Indicated full charged battery.
3.5.3.3 LOW BATT./ DISCONNECTED : Indicated battery capacity is nearly empty or DC loads are disconnected from the charge controller.

Table of indicator lights and operation of SOLARCON SET-series Charge Controller

Indicator	OFF	SLOW BLINK	FAST BLINK	ON
CHARGING (green)	Not operating	SOLARCON is charging batteries	DC power generated from PV but not enough to charge batteries.	-
FLOAT (yellow)	-	-	-	SOLARCON operates in float charge mode. Full battery level
LOW BATT/ DISCONNECT (red)	-	Battery level is very low. SOLARCON stop opreate and does not supply power to DC loads.	Low battery level but SOLARCON can supply power to DC loads.	-

INSTALLATION AND OPERATION

4.1 Installation

4.1.1 Remove the solar panel by unscrew the 4 screws on solar panel strip.
4.1.2 Remove the cover plate of charge controller and battery.
4.1.3 Connect battery to charge controller. Verify battery polarity before start connection. If correct polarity, CHARGING lamp will start to blink.
4.1.4 Replace the cover plate of charge controller and battery.
4.1.5 Replace the solar panel and rescrew 4 screws in place.
4.1.6 Place the solar panel on the suitable direction for your country side, ex. the suitable direction for Thailand is south.
4.1.7 Mount the SOLAR OBSTRUCTION LIGHT SYSTEM by clamping with the tubular or mount on plate.

4.2 Operation

SOLAR OBSTRUCTION LIGHT SYSTEM will operate automatically and start to charging battery when there are sufficient sunlight.

4.3 Replacement battery

4.3.1 Remove the solar panel by unscrew the 4 screws on solar panel strip.
4.3.2 Remove the cover plate of charge controller and battery
4.3.3 Unscrew battery strip.
4.3.4 Disconnect the battery cable and remove the battery.
4.3.5 Replace the new battery and connect to charge controller. Verify battery polarity before start connection.
4.3.6 Replace the battery strip and rescrew.
4.3.7 Replace the cover plate of charge controller and battery.
4.3.8 Mount the solar panel at the same place.

4.4 Remove the charge controller for maintenance

4.4.1 Remove the solar panel by unscrew the 4 screws on solar panel strip.
4.4.2 Remove the cover plate of charge controller and battery
4.4.3 Disconnect the battery cable from battery
4.4.4 Disconnect the obstruction lamp cable from the DC LOAD terminal at the bottom of charge controller

4.4.5 Disconnect the solar panel cable from PV terminal at the bottom of charge controller

4.4.6 Disconnect the battery cable from BATTERY terminal at the bottom of charge controller

4.4.7 Disconnect ground cable from EARTH terminal at the bottom of charge controller

4.4.8 Unscrew the charge controller and send it to LEONICS service center for maintenance.

Note: After maintenance, user should connect ground, battery, solar panel and obstruction lamp accordingly

TROUBLESHOOTING

In case of any queries or concerns that are not referenced in this guide, please contact a LEONICS service center, LEONICS local distribuitor or e-mail your queires to support@leonics.com

Symptoms	Possible causes	Solutions
Obstruction light does not operate.	- The cable disconnect from terminal - Low battery voltage.	Check connection of the obstruction lamp, solar panel and battery.