



SLC420

Compact 4-5nm+ Solar Marine Lantern Installation & Service Manual

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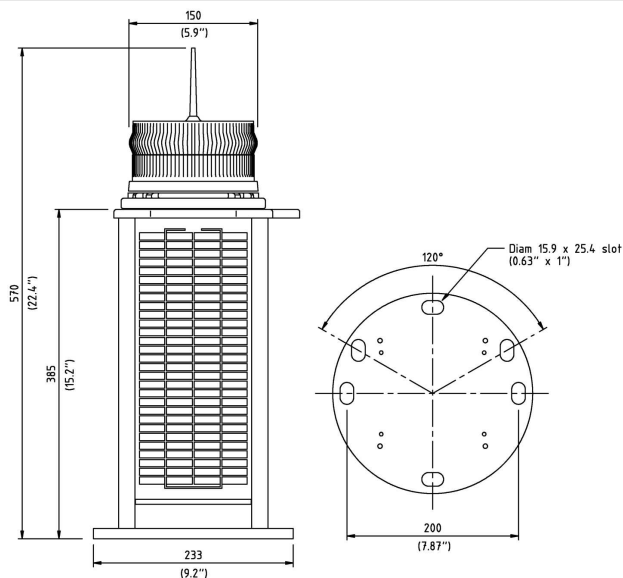
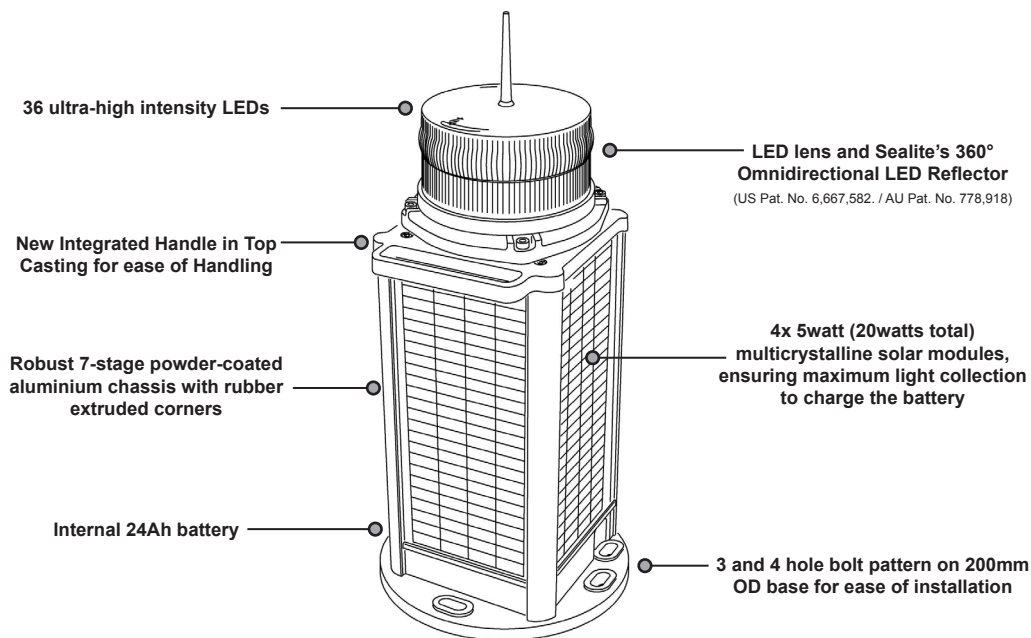


Fig 1. SLC420 Solar Marine Lantern

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Version No.	Description	Date	Approved
2.0	Update - New Design	15 Feb 2010	A. Dixon
2.1	Logo, Warranty and Regulator Update	1 July 2010	K. Paton
2.2	Update: Spec Table	May 2012	J. Dore



Introduction

Congratulations! By choosing to purchase a Sealite lantern you have become the owner of one of the most advanced LED marine lanterns in the world.

Sealite Pty Ltd has been manufacturing lanterns for over 25 years, and particular care has been taken to ensure your lantern gives years of service.

As a commitment to producing the highest quality products for our customers, Sealite has been independently certified as complying with the requirements of ISO9001:2008 quality management system.

Sealite lanterns comply with requirements of the US Coast Guard in 33 CFR part 66 for Private Aids To Navigation.

By taking a few moments to browse through this booklet, you will become familiar with the versatility of your lantern, and be able to maximise its operating function.

Please remember to complete the Sealite warranty registration card accompanying your lantern.

Operating Principle

The solar module of the lantern converts sunlight to an electrical current that is used to charge the battery. The battery provides power to operate the lantern at night.

The flasher unit has very low current requirements. A microprocessor drives an array of ultra bright LED's through a DC/DC converter, which enables the LED's to operate within the manufacturer's specifications. The battery is protected from over-charging within the circuit to ensure maximum battery life.

On darkness, the microprocessor will initiate a program check and after approximately 1 minute begin flashing to the set code.

Technology

Sealite is the world's fastest growing manufacturer of marine aids to navigation. We employ leading mechanical, optical, hardware & software engineers to create innovative products to service the needs of our customers worldwide, and offer the widest range of solar-powered LED lanterns in the marketplace.

Electronics

Sealite employs leading in-house electronic engineers in the design and development of software and related circuitry. All individual electronic components are sourced directly by Sealite procurement staff ensuring that only the highest quality components are used in our products.

LED Technology

All marine lanterns use the latest advancements in LED (Light Emitting Diode) technology as a light source. The major advantage of LED's over traditional light sources is well established in that they typically have an operational life in excess of 100,000 hours, resulting in substantial savings to maintenance and servicing costs.

Precision Construction

Commitment to investing in the design and construction of injection-moulded parts including optic lenses, light bases and a range of other components ensures that all Sealite products are of a consistent & superior quality.

Optical Performance

Sealite manufactures a range of marine LED lenses moulded from multi-cavity dies. Complex shapes such as the SL70, BargeSafe™ and 16-segment multi-focus lenses are a testament to the company's superior in-house lens manufacturing capabilities and outstanding optical performance.

Award-winning, Patented Technology

Several United States and Australian patent registrations are held on Sealite's range of innovative designs, with other regional patents pending in Canada, United Kingdom and Europe.



SLC420 Model

The robust design of this self-contained light ensures up to 12 years of reliable service with minimal ongoing maintenance. Specifically designed to survive the harshest environment the SLC420 features seven stage powder coated aluminium Top, Base and internal Aluminium Chassis.

The corners are made from UV stabilised rubber. This construction method allows the customer to change a solar panel in the unlikely event of damage.

The top casting is constructed with an integrated handle that helps with any manual handling of the unit.

The high impact resistant polycarbonate lens ensures even light visibility.

Four 5watt solar panels provide efficient and year round charging of the large 12V 24Ah SLA battery.

The powder coated aluminium base can be mounted on both a 3 or 4 hole 200mm (8") bolt pattern.

The SLC420 can also be fitted with either GPS Synchronisation, or GSM Monitoring & Control or Radio Control.

All this is backed by Sealite's industry leading 3-year warranty.

SPECIFICATIONS •

Light Characteristics

Light Source
Available Colours
Maximum Available Intensity (cd)†
Visible Range (nm)
Horizontal Output (degrees)
Vertical Divergence (degrees)
Reflector Type

Available Flash Characteristics
Intensity Adjustments
LED Life Expectancy (hours)

Electrical Characteristics

Current Draw (mA)
Circuit Protection
Nominal Voltage (V)
Autonomy (days)
Temperature Range

Solar Characteristics

Solar Module Type
Output (watts)
Solar Module Efficiency (%)
Charging Regulation

Power Supply

Battery Type
Battery Capacity (Ah)
Nominal Voltage (V)
Battery Service Life

Physical Characteristics

Body Material

Lens Material
Lens Diameter (mm/inches)
Lens Design
Mounting
Height (mm/inches)
Width (mm/inches)
Mass (kg/lbs)
Product Life Expectancy

Certifications

CE
Quality Assurance
Waterproof

Intellectual Property

Patents
Trademarks

Warranty *

Options Available

36 ultra-high intensity LEDs
Red, Green, White, Yellow, Blue
Red - 142 Green - 125 White - 119 Yellow - 102
4-5+
360
9
Omnidirectional 360° LED Reflector
(US Pat. No. 6,667,582. AU Pat. No. 778,918)
Up to 256 IALA recommended (user adjustable)
Adjustable in 25% increments
>100,000

Refer to Sealite Power Calculator
Integrated
12
>15 (14 hour darkness, 12.5% duty cycle)
-40 to 80°C

Multicrystalline
20 (4 x 5watt)
14
Microprocessor controlled

SLA (Sealed Lead Acid)
24
12
Average 5 years

7-stage powder-coated aluminium chassis with UV-stabilised rubber corners and gaskets
LEXAN® Polycarbonate – UV-stabilised
150 / 5⁷/₈
External optics with interior flute design
3 & 4 hole bolt pattern on 200mm OD base
570 / 22²/₅
233 / 9¹/₅
13.9 / 30⁵/₈
Up to 12 years

EN61000-6-3:1997. EN61000-6-1:1997
ISO9001:2008
IP68

US Pat. No. 6,667,582. AU Pat. No. 778,918
SEALITE® is a registered trademark of Sealite Pty Ltd
3 years

- GPS Synchronisation
- RF Synchronisation
- GSM Monitoring & Control System
- Radio Control System
- *Note* - remote monitoring/control will reduce visible range of lantern due to increased power consumption
- 50mm pole mount adapter plate

• Specifications subject to change or variation without notice
* Subject to standard terms and conditions
† Intensity setting subject to solar availability





SLC420 Optional Configurations

GPS Synchronisation (SLC420-GPS)

This GPS option can be added to the SLC420 model previously outlined, and provides the user with the ability to mark a channel, port or river with independently operating lanterns that all flash in synchronisation. This improves the effectiveness of marker lights by highlighting the channel, port or river outline each time all the synchronised lights turn on.

No additional power supplies, aerials or control systems are required, and with its microprocessor-based system, the SLC420-GPS option is specifically designed to provide maximum reliability and performance over a wide range of environmental conditions. The GPS board is a separate PCB mounted above the standard SLC420 circuitry.

RF Synchronisation (SLC420-CS)

The SLC420-CS (Comm-sync) flash synchronised solar marine lantern is fitted with an internal RF module that operates on a 2.4Ghz frequency and has an operational range of 1.5km between 2 lights. Should more than two lights be required to be synchronised the range may be extended for longer distances as the lanterns transmit data to the adjacent lantern, causing it to fall into synchronisation. The only limitation is no lantern should be more than 1.5km from the next lantern in series.

The SLC420-CS lanterns operate within a peer to peer network topology and therefore are not dependant upon Master/Slave relationships. Using innovative software, the additional power consumption is minimal and in most configurations the SLC420-CS requires only 2 hours of direct sunlight per day to retain full working autonomy.

GSM Monitoring & Control (SLC420-GSM)

The SL420 may also be fitted with GSM monitoring and control capabilities, enabling users to access real-time diagnostic data remotely via Cell-phone or PC integration.

For more information please download the GSM Monitoring & Control System Manual from www.sealite.com

Radio Control (SLC420-RC)

Sealite's radio-controlled lanterns (SLC420-RC) enable users to remotely customise the programming of their lanterns by a menu driven 2.4GHz handheld transceiver or PC interface.



Installation

Charging the Battery

New lanterns should be left in the sun for 1-2 days to ensure battery is charged before placing in service. Please note, lantern will re-charge even when toggle switch is turned to 'OFF' position.

Preferred Installation Location

For best lantern performance, ensure solar modules are not covered and are in clear view of the sky with no shadows.

Lantern Operation

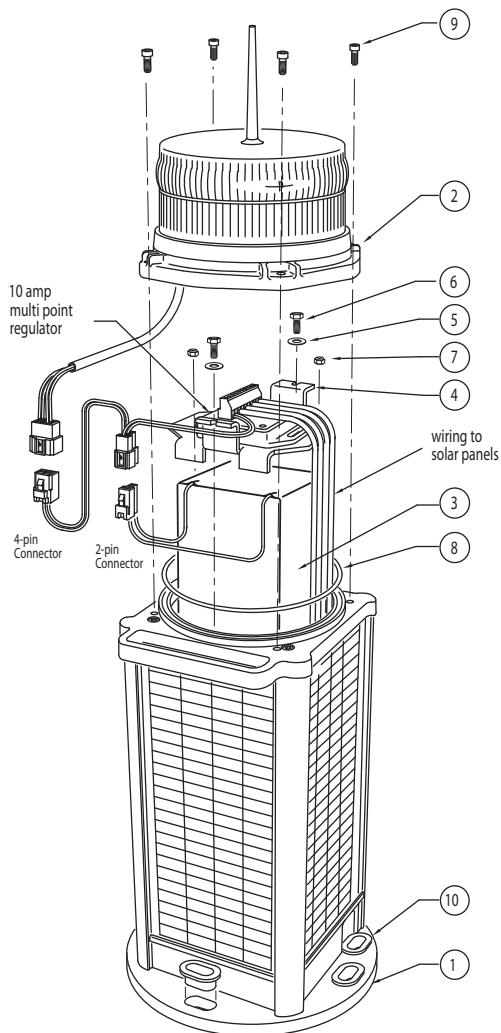
The Lantern is activated by connecting the 2-Pin Connector between the battery and the regulator. Flash Codes and Intensity settings needs to be set prior to activation.

IMPORTANT: *to ensure the life of your product it is important that when attaching the Lens Assembly (part #2) back onto the lantern base, that an even seal is created.*

Half tighten all 4 socket head screws, and then fully tighten each socket head screw to ensure an even seal.

Activation and Testing of SLC420

1. Remove the four socket-head screws on the top lens assembly and lift the SLC420 lens assembly off the body.
2. The power and range settings of the lantern are adjusted by setting the DIP switches inside the lantern. Your lantern is normally set to maximum range (see 'Selecting Intensity/Power Setting' section of this manual).
3. Adjust the rotary switches (A and B) to desired flash setting (see 'Selecting a Flash Code' section of this manual).
4. Join the 4-Pin connector and the 2-Pin connector together to join the battery and solar panels to the light head. The battery is disconnected to reduce discharge during transportation and for long term storage.
5. Feed all wiring back inside lantern body, and make sure the o-ring is properly placed at the top of the lantern body.
6. Place the top lens assembly back onto the lantern body and replace 4 socket head screws. Make sure to tighten the 4 x cap screws evenly when securing the lens assembly.
The unit is now ready for normal operation, once placed in darkness.
7. To test place dark cover (towel or jacket) on top of light to activate sensor, light will come on after 30 seconds.
8. Ensure that the unit is bolted to an even, flat surface.



Item	Description	Quantity
1	SLC420 Base	1
2	SLC420 Lens Assembly	1
3	Battery 12v 24Ah	1
4	Battery Clamp	1
5	Washer M4	2
6	M4 Socket Head Cap Screw	2
7	Nylock Nut M5	2
8	O-Ring, ID 145 x 4.0	1
9	Socket Head Screw M6 x 20	4
10	Mounting Insert	6

Fig 2. SLC420
Solar Marine Lantern components

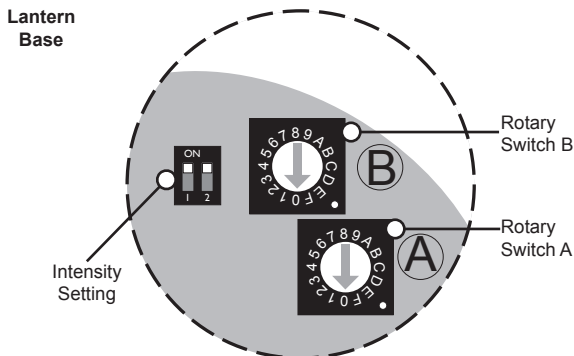
IMPORTANT

To ensure the life of your product it is important that when attaching the Lens Assembly (part #2) back onto the lantern base, that an even seal is created.

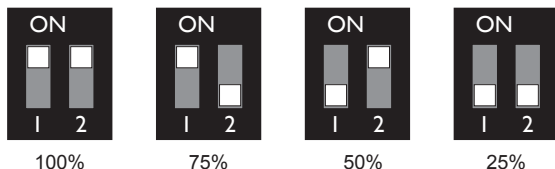
Half tighten all 4 socket head screws, and then fully tighten each socket head screw to ensure an even seal.

Selecting an Intensity/Power Setting

Intensity/power settings on Sealite lanterns operate via DIP switches, located near the rotary switches on the flasher unit. The pulse settings may be used to reduce the power consumption and intensity of the lantern. Setting the lantern to 25% intensity will reduce the power consumption to 25% of the normal 100% setting and the range by 25%. This setting may be used to adjust the current draw of the light to local sunlight conditions.



The following diagrams indicate intensity/power settings:-



Intensity Setting	Colour	Power mA / hour	Colour	Power mA / hour
100%	White, Green, Blue	320mA	Red, Yellow	420mA
75%		241mA		316mA
50%		161mA		211mA
25%		482mA		107mA

Power Consumption Calculator

Night Hours
(use 13.7 if unknown)

Power
mA/hour

Duty Cycle
(e.g. 20% = 0.2)

Total power used per night
(mA)

	X		X		=	
--	---	--	---	--	---	--

Total power used per night
(mAh)

Solar Panel Charge (mA)

Number of full sunlight hours required to break even
(the amount of time it will take for the solar to replace what the light took out overnight)

	/	435	=	
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If the number of Full Sunlight hours is greater than 2.5-3.0 hours, please consider reducing the intensity (Power) or reducing the Duty Cycle.

Selecting a Flash Code - Rotary Switches A & B

All lanterns have 2 rotary switches marked A and B on the flasher unit, as below. Turning the small arrows to the appropriate number or letter will set the code (see 'Flash Code' section, page 11). The unit may take up to one minute to activate a new flash code. A comprehensive list of available flash codes is listed in the '*Flash Codes*' section of this manual.

Example:

SWITCH		FLASH CODE	ON	OFF
A	B			
A	0	FL 3 S	0.3	2.7



Flash Codes

The Sealite Lantern may be set to any of 256 IALA recommended flash settings which are user-adjustable onsite without the need for external devices.

SEALITE® code reference is listed by number of flashes

**For the latest version of this document visit www.sealite.com,
or email info@sealite.com**

Symbols

FL	Flash followed by number Eg. FL 1 S, one flash every second
F	Fixed
Q	Quick flash
VQ	Very quick flash
OC	Occulting; greater period on than off
ISO	Isophase; equal period on and off
LFL	Long flash long
MO	Morse code () contains letter

For example, VQ (6) + LFL 10 S means 6 very quick flashes followed by a long flash, during a 10-second interval.

The amount of power your lantern draws through the night depends on the duty cycle, i.e. the amount of time on as a proportion to the timing cycle. For example, 0.5 seconds on and 4.5 seconds off equals a 10% duty cycle.

It is best to operate at the lowest duty cycle appropriate to the actual needs of the application.

Recommended Rhythm for Flashing Light - IALA Regions A and B

MARK DESCRIPTION	RHYTHM
Port Hand & Starboard Marks:	Any, other than Composite Group Flashing (2+1)
Preferred Channel Starboard:	Composite Group Flashing (2+1)
Preferred Channel Port:	Composite Group Flashing (2+1)
North Cardinal Mark:	Very quick or quick
East Cardinal Mark:	Very quick (3) every 5 seconds or quick (3) every 10 seconds
South Cardinal Mark:	Very quick (6) + long flash every 10 seconds or quick (6) + long flash every 15 seconds
West Cardinal Mark:	Very quick (9) every 10 seconds or quick (9) every 15 seconds
Isolated Danger Mark:	Group flashing (2)
Safe Water Mark:	Isophase, occulting, one long flash every 10 seconds or Morse Code "A"
Special Marks:	Any, other than those described for Cardinal, Isolated Danger or Safe Water Marks

SWITCH	FLASH CODE	ON	OFF
A	B		
0	0	F (Steady light)	
D	3	VQ 0.5 S	0.2 0.3
E	3	VQ 0.6 S	0.2 0.4
F	3	VQ 0.6 S	0.3 0.3
7	3	Q 1 S	0.2 0.8
8	3	Q 1 S	0.3 0.7
9	3	Q 1 S	0.4 0.6
A	3	Q 1 S	0.5 0.5
8	4	Q 1 S	0.8 0.2
B	3	Q 1.2 S	0.3 0.9
9	4	Q 1.2 S	0.5 0.7
C	3	Q 1.2 S	0.6 0.6
F	4	FL 1.5 S	0.2 1.3
1	0	FL 1.5 S	0.3 1.2
0	5	FL 1.5 S	0.4 1.1
0	4	FL 1.5 S	0.5 1.0
2	0	FL 2 S	0.2 1.8
3	0	FL 2 S	0.3 1.7
4	0	FL 2 S	0.4 1.6
5	0	FL 2 S	0.5 1.5
6	0	FL 2 S	0.7 1.3
7	0	FL 2 S	0.8 1.2
1	2	ISO 2 S	1.0 1.0
8	0	FL 2.5 S	0.3 2.2
9	0	FL 2.5 S	0.5 2.0
D	6	FL 2.5 S	1.0 1.5
1	5	FL 3 S	0.2 2.8
A	0	FL 3 S	0.3 2.7
2	5	FL 3 S	0.4 2.6
B	0	FL 3 S	0.5 2.5
3	5	FL 3 S	0.6 2.4
C	0	FL 3 S	0.7 2.3
D	0	FL 3 S	1.0 2.0
2	2	ISO 3 S	1.5 1.5
5	4	OC 3 S	2.0 1.0
E	2	OC 3 S	2.5 0.5
4	6	OC 3.5 S	2.5 1.0
4	5	FL 4 S	0.2 3.8
5	5	FL 4 S	0.3 3.7
E	0	FL 4 S	0.4 3.6
F	0	FL 4 S	0.5 3.5
6	5	FL 4 S	0.6 3.4
0	1	FL 4 S	0.8 3.2
1	1	FL 4 S	1.0 3.0
2	1	FL 4 S	1.5 2.5
3	2	ISO 4 S	2.0 2.0
3	6	OC 4 S	2.5 1.5
F	2	OC 4 S	3.0 1.0
3	1	FL 4.3 S	1.3 3.0
8	5	FL 5 S	0.2 4.8
4	1	FL 5 S	0.3 4.7
5	1	FL 5 S	0.5 4.5
9	5	FL 5 S	0.9 4.1
6	1	FL 5 S	1.0 4.0

SWITCH	FLASH CODE	ON	OFF
A	B		
7	1	FL 5 S	1.5 3.5
4	2	ISO 5 S	2.5 2.5
8	2	LFL 5 S	2.0 3.0
0	3	OC 5 S	3.0 2.0
1	3	OC 5 S	4.0 1.0
2	3	OC 5 S	4.5 0.5
C	6	FL 6 S	0.2 5.8
B	5	FL 6 S	0.3 5.7
C	5	FL 6 S	0.4 5.6
8	1	FL 6 S	0.5 5.5
9	1	FL 6 S	0.6 5.4
A	1	FL 6 S	1.0 5.0
7	5	FL 6 S	1.2 4.8
B	1	FL 6 S	1.5 4.5
5	2	ISO 6 S	3.0 3.0
9	2	LFL 6 S	2.0 4.0
6	4	OC 6 S	4.0 2.0
3	3	OC 6 S	4.5 1.5
4	3	OC 6 S	5.0 1.0
A	4	FL 7 S	1.0 6.0
9	6	FL 7 S	2.0 5.0
5	6	OC 7 S	4.5 2.5
D	5	FL 7.5 S	0.5 7.0
C	1	FL 7.5 S	0.8 6.7
E	5	FL 8 S	0.5 7.5
B	4	FL 8 S	1.0 7.0
6	2	ISO 8 S	4.0 4.0
A	2	LFL 8 S	2.0 6.0
6	6	OC 8 S	5.0 3.0
B	2	LFL 8 S	3.0 5.0
F	5	FL 9 S	0.9 8.1
C	4	FL 9 S	1.0 8.0
7	6	OC 9 S	6.0 3.0
0	6	FL 10 S	0.2 9.8
1	6	FL 10 S	0.3 9.7
D	1	FL 10 S	0.5 9.5
2	6	FL 10 S	0.8 9.2
E	1	FL 10 S	1.0 9.0
1	4	FL 10 S	1.5 8.5
C	2	LFL 10 S	2.0 8.0
D	2	LFL 10 S	3.0 7.0
7	2	ISO 10 S	5.0 5.0
2	4	LFL 10 S	4.0 6.0
8	6	OC 10 S	6.0 4.0
5	3	OC 10 S	7.0 3.0
6	3	OC 10 S	7.5 2.5
F	1	FL 12 S	1.2 10.8
D	4	FL 12 S	2.5 9.5
3	4	LFL 12 S	2.0 10.0
0	2	FL 15 S	1.0 14.0
4	4	LFL 15 S	4.0 11.0
7	4	OC 15 S	10 5.0
A	6	LFL 20 S	2.0 18.0
E	4	FL 26 S	1.0 25.0

SWITCH	FLASH CODE	ON	OFF	ON	OFF
A	B				
0	A FL (2) 4 S	0.5	1.0	0.5	2.0
E	B VQ (2) 4 S	0.2	1.0	0.2	2.6
1	A FL (2) 4.5 S	0.3	1.0	0.3	2.9
2	A FL (2) 4.5 S	0.4	1.0	0.4	2.7
3	A FL (2) 4.5 S	0.5	1.0	0.5	2.5
F	9 FL (2) 5 S	0.2	0.8	0.2	3.8
2	C FL (2) 5 S	0.2	1.2	0.2	3.4
4	A FL (2) 5 S	0.4	0.6	0.4	3.6
0	7 FL (2) 5 S	0.5	1.0	0.5	3.0
1	7 FL (2) 5 S	1.0	1.0	1.0	2.0
9	B Q (2) 5 S	0.3	0.7	0.3	3.7
2	9 Q (2) 5 S	0.5	0.5	0.5	3.5
5	A FL (2) 5.5 S	0.4	1.4	0.4	3.3
7	8 FL (2) 6 S	0.3	0.6	1.0	4.1
A	A FL (2) 6 S	0.3	0.9	0.3	4.5
6	A FL (2) 6 S	0.3	1.0	0.3	4.4
7	A FL (2) 6 S	0.4	1.0	0.4	4.2
9	9 FL (2) 6 S	0.5	1.0	0.5	4.0
2	8 FL (2) 6 S	0.8	1.2	0.8	3.2
3	7 FL (2) 6 S	1.0	1.0	1.0	3.0
3	9 Q (2) 6 S	0.3	0.7	0.3	4.7
A	9 FL (2) 7 S	1.0	1.0	1.0	4.0
7	B FL (2) 8 S	0.4	0.6	2.0	5.0
8	A FL (2) 8 S	0.4	1.0	0.4	6.2
4	7 FL (2) 8 S	0.5	1.0	0.5	6.0
8	8 FL (2) 8 S	0.8	1.2	2.4	3.6
5	7 FL (2) 8 S	1.0	1.0	1.0	5.0
4	C OC (2) 8 S	3.0	2.0	1.0	2.0
5	C OC (2) 8 S	5.0	1.0	1.0	1.0
F	B VQ (2) 8 S	0.2	1.0	0.2	6.6
9	A FL (2) 10 S	0.4	1.6	0.4	7.6
9	8 FL (2) 10 S	0.5	0.5	1.5	7.5
6	7 FL (2) 10 S	0.5	1.0	0.5	8.0
7	7 FL (2) 10 S	0.5	1.5	0.5	7.5
6	9 FL (2) 10 S	0.5	2.0	0.5	7.0
8	7 FL (2) 10 S	0.8	1.2	0.8	7.2
B	9 FL (2) 10 S	1.0	1.0	1.0	7.0
9	7 FL (2) 10 S	1.0	1.5	1.0	6.5
4	9 Q (2) 10 S	0.6	0.4	0.6	8.4
B	A FL (2) 12 S	0.4	1.0	0.4	10.2
C	9 FL (2) 12 S	0.5	1.0	0.5	10.0
D	9 FL (2) 12 S	1.5	2.0	1.5	7.0
A	8 FL (2) 15 S	0.5	1.5	2.0	11.0
A	7 FL (2) 15 S	1.0	2.0	1.0	11.0
8	B Q (2) 15 S	0.2	0.8	0.2	13.8
C	A FL (2) 20 S	1.0	3.0	1.0	15.0
D	A FL (2) 25 S	1.0	1.0	1.0	22.0

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF
A	B						
7	9 Q (3) 5 S	0.5	0.5	0.5	0.5	0.5	2.5
5	9 VQ (3) 5 S	0.2	0.3	0.2	0.3	0.2	3.8
0	C VQ (3) 5 S	0.3	0.2	0.3	0.2	0.3	3.7
E	9 VQ (3) 5 S	0.3	0.3	0.3	0.3	0.3	3.5
3	C FL (3) 6 S	0.5	1.0	0.5	1.0	0.5	2.5
2	B FL (2+1) 6 S	0.3	0.4	0.3	1.2	0.3	3.5



SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF
A	B						
A	B Q (3) 6 S	0.3	0.7	0.3	0.7	0.3	3.7
F	A FL (3) 8 S	0.5	1.0	0.5	1.0	0.5	4.5
0	B FL (3) 9 S	0.3	1.0	0.3	1.0	0.3	6.1
B	7 FL (3) 9 S	0.8	1.2	0.8	1.2	0.8	4.2
B	8 FL (3) 10 S	0.3	0.7	0.3	0.7	0.9	7.1
C	8 FL (3) 10 S	0.4	0.6	0.4	0.6	1.2	6.8
C	B FL (3) 10 S	0.5	0.5	0.5	0.5	0.5	7.5
C	7 FL (3) 10 S	0.5	1.5	0.5	1.5	0.5	5.5
D	B FL (3) 10 S	0.6	0.6	0.6	0.6	0.6	7.0
D	7 FL (3) 10 S	1.0	1.0	1.0	1.0	1.0	5.0
3	8 FL (2+1) 10 S	0.5	0.7	0.5	2.1	0.5	5.7
8	9 OC (3) 10 S	5.0	1.0	1.0	1.0	1.0	1.0
B	B Q (3) 10 S	0.3	0.7	0.3	0.7	0.3	7.7
D	8 FL (2 + 1) 10 S	0.5	0.5	0.5	0.5	1.5	6.5
1	B FL (3) 12 S	0.5	1.5	0.5	1.5	0.5	7.5
E	A FL (3) 12 S	0.5	2.0	0.5	2.0	0.5	6.5
E	7 FL (3) 12 S	0.8	1.2	0.8	1.2	0.8	7.2
B	6 FL (3) 12 S	1.0	1.0	1.0	3.0	1.0	5.0
4	8 FL (2+1) 12 S	0.8	1.2	0.8	2.4	0.8	6.0
5	8 FL (2+1) 12 S	1.0	1.0	1.0	4.0	1.0	4.0
1	8 FL (2+1) 13.5 S	1.0	1.0	1.0	4.0	1.0	5.5
F	7 FL (3) 15 S	0.3	1.7	0.3	1.7	0.3	10.7
9	D FL (3) 15 S	0.4	1.0	0.4	1.0	0.4	11.8
0	8 FL (3) 15 S	0.5	1.5	0.5	1.5	0.5	10.5
F	8 FL (2+1) 15 S	0.6	0.3	0.6	0.3	1.4	11.8
0	9 FL (2+1) 15 S	0.7	0.5	0.7	0.5	1.9	10.7
1	9 FL (2+1) 15 S	0.7	0.7	0.7	0.7	2.1	10.1
6	8 FL (2+1) 15 S	1.0	2.0	1.0	5.0	1.0	5.0
1	C VQ (3) 15 S	0.1	0.5	0.1	0.5	0.1	13.7
4	B FL (3) 20 S	0.5	3.0	0.5	3.0	0.5	12.5
3	B FL (3) 20 S	0.5	1.5	0.5	1.5	0.5	15.5
5	B FL (3) 20 S	0.8	1.2	0.8	1.2	0.8	15.2
6	B FL (3) 20 S	1.0	1.0	1.0	1.0	1.0	15.0

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF	ON	OFF
A	B								
B	F VQ (4) 4 S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.3
B	D Q (4) 6 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	2.7
8	D Q (4) 6 S	0.4	0.6	0.4	0.6	0.4	0.6	0.4	2.6
1	D FL (4) 10 S	0.5	1.0	0.5	1.0	0.5	1.0	0.5	5.0
2	D FL (4) 10 S	0.8	1.2	0.8	1.2	0.8	1.2	0.8	3.2
F	E Q (4) 10 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	6.7
B	E FL (4) 12 S	0.3	1.7	0.3	1.7	0.3	1.7	0.3	5.7
4	F FL (4) 12 S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	8.5
C	E FL (4) 12 S	0.5	1.5	0.5	1.5	0.5	1.5	0.5	5.5
3	D FL (4) 12 S	0.8	1.2	0.8	1.2	0.8	1.2	0.8	5.2
A	D Q (4) 12 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	8.7
4	D FL (4) 15 S	0.5	1.5	0.5	1.5	0.5	1.5	0.5	8.5
8	E FL (4) 15 S	1.0	1.0	1.0	1.0	1.0	1.0	1.0	8.0
7	D FL (4) 15 S	1.5	0.5	0.5	0.5	0.5	0.5	0.5	10.5
D	E FL (4) 16 S	0.5	1.5	0.5	1.5	0.5	1.5	0.5	9.5
C	D FL (4) 20 S	0.3	3.0	0.3	3.0	0.3	3.0	0.3	9.8
5	D FL (4) 20 S	0.5	1.5	0.5	1.5	0.5	1.5	0.5	13.5
0	D FL (4) 20 S	0.5	1.5	0.5	1.5	0.5	4.5	0.5	10.5
3	F FL (4) 20 S	1.5	1.5	1.5	1.5	1.5	1.5	1.5	9.5
0	F Q (4) 20 S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	16.5
E	E Q (4) 28 S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	24.5
6	F FL (4) 30 S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	26.5

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
A	B											
D	D	Q (5) 7 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	2.7
E	D	Q (5) 10 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	5.7
E	8	FL (5) 16.5 S	5.0	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	3.5
5	F	FL (5) 20 S	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	15.5
9	F	FL (5) 20 S	0.8	1.2	0.8	1.2	0.8	1.2	0.8	1.2	0.8	11.2
9	E	FL (5) 20 S	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	11.0

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
A	B													
F	D	Q (6) 10 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	4.7
A	F	FL (6) 15 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	9.7
7	F	FL (6) 15 S	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	7.0
A	E	FL (6) + LFL 15 S	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.5	7.0

SWITCH	FLASH CODE		ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
A	B															
6	E	VQ (6) + LFL 10 S	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	2.0	5.0
7	E	VQ (6) + LFL 10 S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.0	4.4
2	F	Q (6) + LFL 15 S	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	2.0	7.0
2	E	Q (6) + LFL 15 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	2.0	7.0
3	E	Q (6) + LFL 15 S	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	2.0	5.8
8	F	VQ (6) + LFL 15 S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2.0	9.4

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
A	B																		
4	E	VQ (9) 10 S	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	5.8
5	E	VQ (9) 10 S	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	4.9
1	F	Q (9) 15 S	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	0.2	0.8	6.8
0	E	Q (9) 15 S	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7	6.7
1	E	Q (9) 15 S	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	4.8

SWITCH	FLASH CODE	ON	OFF	ON	OFF	ON	OFF	ON	OFF
A	B								
MORSE CODE () INDICATES LETTER									
7	8	MO (A) 6 S	0.3	0.6	1.0	4.1			
7	B	MO (A) 8 S	0.4	0.6	2.0	5.0			
8	8	MO (A) 8 S	0.8	1.2	2.4	3.6			
B	8	MO (U) 10 S	0.3	0.7	0.3	0.7	0.9	7.1	
C	8	MO (U) 10 S	0.4	0.6	0.4	0.6	1.2	6.8	
D	8	MO (U) 10 S	0.5	0.5	0.5	0.5	1.5	6.5	
9	8	MO (A) 10 S	0.5	0.5	1.5	7.5			
8	9	MO (D) 10 S	5.0	1.0	1.0	1.0	1.0	1.0	
A	8	MO (A) 15 S	0.5	1.5	2.0	11.0			
F	8	MO (U) 15 S	0.6	0.3	0.6	0.3	1.4	11.8	
0	9	MO (U) 15 S	0.7	0.5	0.7	0.5	1.9	10.7	
1	9	MO (U) 15 S	0.7	0.7	0.7	0.7	2.1	10.1	
7	D	MO (B) 15 S	1.5	0.5	0.5	0.5	0.5	0.5	10.5



Maintenance and Servicing

Designed to be almost maintenance-free, the SLC420 requires minimal attention, though the following maintenance and servicing information is provided to help ensure the life of your Sealite product.

1. **Cleaning Solar Panels-** occasional cleaning of the solar panels may be required. Using a cloth and warm soapy water, wipe off any foreign matter before rinsing the panels with fresh water.
2. **Battery Check-** inspection of batteries should be performed every three years (minimum) to ensure that the charger, battery and ancillary electronics are functioning correctly. Using a voltage meter, check that the battery voltage is at least 12 volts under 100MA load, and ensure all terminals are clear of foreign matter.
3. **O-Ring Check-** inspect the condition of the o-ring for damage, wear or if it is brittle, and replace if necessary. The o-ring should be a rubber texture to ensure a complete and even seal.

Replacing the battery

The SLC420 has an internal battery compartment which provides the user with the ability to change the battery after years of operation.

1. Remove the four socket-head screws on the top lens assembly and separate the SLC420 lens assembly from the body/base section.
2. Remove 2 x M4 cap screws & washers from the top of the chassis.
3. Separate the light head and battery connectors.
4. Lift the upper battery bracket out of the SLC420.
5. Remove the old battery from the chassis.
6. Contact Sealite if the replacement battery is not fitted with an Sealite 2 pin connector.
7. Discard old battery in a safe manner.
8. Reconnect the new batter - contact Sealite if you require a new battery. Battery requires a 2 pin connector.
9. Place battery back inside lantern body, and position the upper battery bracket in the top of the chassis.
10. Secure using 2 x M4 cap screws & washers.
11. Feed all wiring back inside lantern body, and make sure the o-ring is properly placed at the top of the lantern body.
12. Place the top lens assembly back onto the lantern body and replace 4 socket head screws. Half tighten all 4 x socket head screws, and then fully tighten each socket head screw to ensure an even seal.
13. To test place dark cover (towel or jacket) on top of light to activate sensor, light will come on after 30 seconds.

Care must be taken to observe the polarity of each wire before they are connected.

To ensure waterproofing of the unit, make sure that no wires are protruding and that there is an even seal.

Always discard old batteries in a safe manner.

IMPORTANT: to ensure the life of your product it is important that when attaching the lens assembly back onto the lantern base, that an even seal is created between the casting and the lens base.

Half tighten all 4 socket head screws, and then fully tighten each socket head screw to ensure an even seal.

How to Change the Regulator

1. Remove the 4 x M6 x 20 socket head cap screws (SHCS) and 4 x M6 nylon washers, then disconnect the light head from the chassis.
2. Remove the 2 x M4 x 20 SHCS, 2 x M4 spring washers and 2 x M4 penny washers then remove the upper battery bracket containing the regulator.
3. Disconnect the battery.
4. Take note of the wire colours and location in the regulator.
5. Disconnect the wires from the regulator.
6. Remove the 2 x M4 CSSK screws, 2 x M4 nylock nuts and 2 x M4 penny washers that retain the regulator to the top battery bracket and remove the regulator.
7. Fit the new regulator using the 2 x M4 CSSK screws, 2 x M4 penny washers and 2 x M4 nylock nuts.
8. Connect the solar positive wires to the solar + points on the regulator.
9. Connect the solar negative wires to the solar – points on the regulator.
10. Connect the battery positive wires to the Battery + point on the regulator.
11. Connect the battery negative wire to the battery – point on the regulator.
12. Reconnect the battery.
13. Refit the battery top bracket into the solar unit using the 2 x M4 x 20 SHCS.
14. Ensure the top O-ring is sitting correctly into the top casting. Refit the light head and tighten the M6 x 20 SHCS with the 4 x M6 nylon washers evenly. **DO NOT OVERTIGHTEN.**



Use the label to ensure correct location of wires during assembly

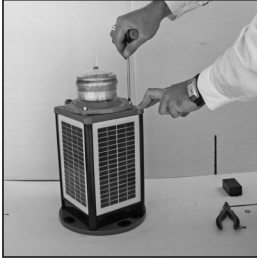


SL10 AMP Regulator shown when correctly fitted

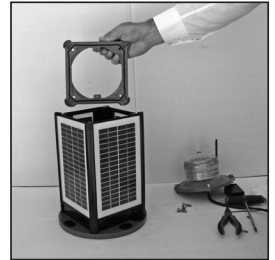
Solar Panel Replacement

The SLC420 is built around an internal aluminium chassis. The solar panels can be user-replaced in the unlikely event that one is broken or damaged during the product's life.

Follow the steps below or contact support@sealite.com for more details.



1. Remove 4 x M6 x 20 socket head cap screws (SHCS) and 4 x M6 nylon washers and disconnect the light head from the chassis
2. Remove the 2 x M4 x 20 socket head cap screws (SHCS), 2 x M4 spring washers and 2 x M4 penny washers. Remove the upper battery bracket containing regulator
3. Disconnect the battery



4. Remove 4 x M6-35mm long socket head cap screws, to remove the top casting from the chassis.

Note:

Be careful not to damage the o-rings on each of these screws. If replacements are required please use standard 6x1.0mm o-ring.



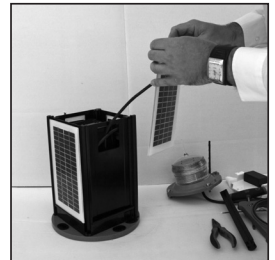
5. Slide the rubber corner out of the chassis, it may be necessary to lubricate the edges of the solar panels with grease or oil based lubricant if this is difficult to remove.
6. Unscrew the affected panel wires from the regulator and remove the solar panel from the chassis.

7. Clean any silicon off the chassis from the solar panel junction box hole and add a new seal to ensure the solar panel is watertight when assembled.

8. Repeat the process in the reverse order to replace a new panel.

Note:

Make sure the O-rings on the top casting and 4 x M6-35mm long socket head cap screws are coated in silicon grease before re-assembling.



The replacement of a solar panel should only be performed by a confident technician.

Sealite cannot guarantee the chassis will remain waterproof, if it not performed by Sealite staff.

To test for any leaks remove the gore vent and pressurise the assembled Light to 1.5psi.

Trouble Shooting

Problem	Remedy
Lantern will not activate.	• Ensure lantern is in darkness. • Wait at least 60 seconds for the program to initialise in darkness. • Ensure switch setting is on a valid code (not unused flash code). • Ensure battery terminals are properly connected. • Ensure battery voltage is above 12volts. • Check the Status LED's on the base of the PCB to determine what type of fault the light is activating. (see <i>Lantern Status</i> section of this manual)
Timing codes will not change.	• Turn rotary switches several times to ensure contacts are clear.
Lantern will not operate for the entire night.	• Expose lantern to direct sunlight and monitor operation for several days. Sealite products typically require 1.5 hours of direct sunlight per day to retain full autonomy. From a discharged state, the lantern may require several days of operational conditions to 'cycle' up to full autonomy. • Reducing the light output intensity or duty cycle (flash code) will reduce current draw on the battery. • Ensure solar module is clean and not covered by shading during the day.

All Sealite boards are fitted with two Indicator LED's. These are positioned near the Flash Code Rotary Switches. Use the table below to help determine operational status.

LED Combinations (Status Indicator LEDs A in Fig.3)		Lantern Status	Lantern	Comment
YELLOW LED	RED LED			
OFF	OFF	Normal	OFF	Normal running condition in daylight.
Flashing ON 0.1 seconds OFF 0.1 seconds	OFF	Normal	ON	Normal running condition.
Flashing ON 0.1 seconds OFF 0.1 seconds	OFF	Normal – synchronised light	ON	Normal running condition but lantern is not synchronised to GPS-enabled lanterns.
Flashing ON 1 second OFF 1 second	OFF	Normal – synchronised light	ON	Normal running condition and lantern is synchronised to GPS- enabled lanterns.
	Fixed-on	Flat Battery (<8v)	OFF	Battery is flat. Battery must receive charge (above 11.5v) and lantern must see daylight for at least 1 minute before operation.
	Flashing ON 0.1 seconds OFF 0.1 seconds	Low Battery Voltage (<10.5v)	ON	Battery is low. Battery must receive charge (above 11.5v) for at least 1 minute.
Fixed-on	OFF	High Battery Voltage / Battery Fully Charged (>15v)	ON	Battery is charged.
Flashing ON 1 second OFF 0.2 seconds	Flashing ON 1 second OFF 0.2 seconds	Factory Setup Mode	ON	Lantern's in factory setup mode (0xFF). Please change the flash code.

NOTE

- 1 second interval flashing Yellow LED indicates light is operating in synchronisation with the optional fitted GPS correctly.
- If checking in daylight lantern must be covered to activate flash pattern.

GPS BOARD (where fitted)

LED Combinations		GPS Status	Lantern	Comment
YELLOW LED	RED LED			
GPS Status Indicator LEDs 'B' (see Fig 3.)				
A. ON steady	OFF	Normal	ON or OFF	GPS powered up.
GPS Status Indicator LEDs 'C' (see Fig 3.)				
B. Flashing ON/OFF very quick constant	Flashing ON/OFF very quick constant faint	Normal	ON	GPS software running.
C. Flashes in sequence with red LED	Flashes in sequence with yellow LED	Off	OFF/ON	GPS software not operational.

Lantern status

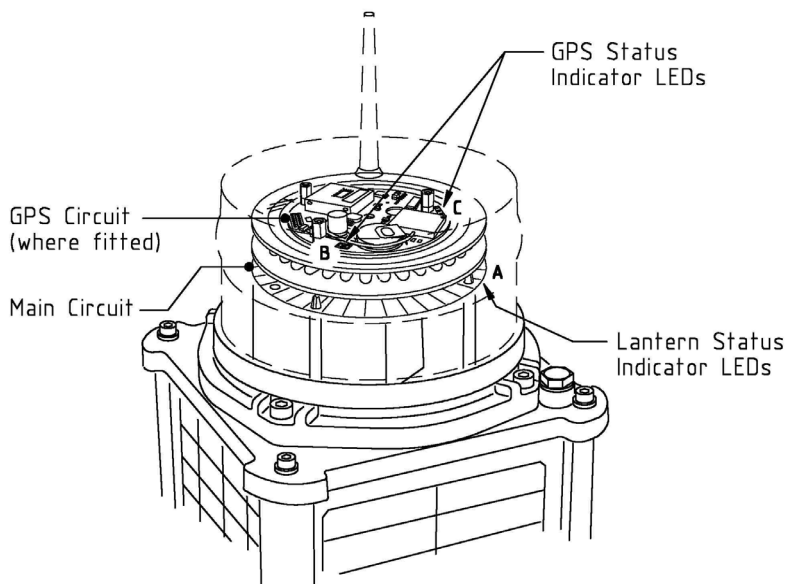


Fig 3. SLC420 Lantern Status

Sealite LED Light Warranty V2.1

Activating the Warranty

Upon purchase, the Sealite Pty Ltd warranty must be activated for recognition of future claims. To do this you have two (2) options:

1. **Postal Registration** - please complete the Sealite Warranty Registration Card and return to Sealite within 30 days of your purchase.
2. **Online Registration** - please complete the Online Registration Form at; www.sealite.com

Sealite Pty Ltd will repair or replace your LED light in the event of electronic failure for a period of up to three years from the date of purchase.

The unit must be returned to Sealite freight prepaid.

Warranty Terms

1. Sealite Pty Ltd warrants that any Sealite marine products fitted with telemetry equipment including but not limited to AIS, GSM, GPS or RF ("Telemetry Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of twelve (12) months from the date of purchase by the original purchaser.
2. Sealite Pty Ltd warrants that any BargeSafe™ Series of LED barge light products ("BargeSafe™ Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of twelve (12) months from the date of purchase by the original purchaser.
3. Sealite Pty Ltd warrants that any LED area lighting products ("Area Lighting Products") but not including sign lighting products will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of twelve (12) months from the date of purchase by the original purchaser.
4. Sealite Pty Ltd warrants that any LED sign lighting products ("Sign Lighting Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser.
5. Sealite Pty Ltd warrants that any Sealite marine lighting products other than the Telemetry Products, BargeSafe™ Products, and Area Lighting Products ("Sealite Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser.
6. Sealite Pty Ltd will repair or replace, at Sealite's sole discretion, any Telemetry Products, BargeSafe™ Products, Area Lighting Products or Sealite Products found to be defective in material and workmanship in the relevant warranty period so long as the Warranty Conditions (set out below) are satisfied.
7. If any Telemetry Products, BargeSafe™ Products, Area Lighting Products or Sealite Products are fitted with a rechargeable battery, Sealite Pty Ltd warrants the battery will be free from defect for a period of one (1) year when used within original manufacturer's specifications and instructions.

Warranty Conditions

This Warranty is subject to the following conditions and limitations;

1. The warranty is applicable to lanterns manufactured from 1/1/2009.
2. The warranty is void and inapplicable if:
 - a. the product has been used or handled other than in accordance with the instructions in the owner's manual and any other information or instructions provided to the customer by Sealite;
 - b. the product has been deliberately abused, or misused, damaged by accident or neglect or in being transported; or
 - c. the defect is due to the product being repaired or tampered with by anyone other than Sealite or authorised Sealite repair personnel.

3. The customer must give Sealite Pty Ltd notice of any defect with the product within 30 days of the customer becoming aware of the defect.
4. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Typical battery replacement period is 3-4 years. Long term exposure to high temperatures will shorten the battery life. Batteries used or stored in a manner inconsistent with the manufacturer's specifications and instructions shall not be covered by this warranty.
5. No modifications to the original specifications determined by Sealite shall be made without written approval of Sealite Pty Ltd.
6. Sealite lights can be fitted with 3rd party power supplies and accessories but are covered by the 3rd party warranty terms and conditions.
7. The product must be packed and returned to Sealite Pty Ltd by the customer at his or her sole expense. Sealite Pty Ltd will pay return freight of its choice. A returned product must be accompanied by a written description of the defect and a photocopy of the original purchase receipt. This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorised dealer and the price paid by the purchaser. On receipt of the product, Sealite Pty Ltd will assess the product and advise the customer as to whether the claimed defect is covered by this warranty.
8. Sealite Pty Ltd reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.
9. Input voltage shall not exceed those recommended for the product.
10. Warranty does not cover damage caused by the incorrect replacement of battery in solar lantern models.
11. This warranty does not cover any damage or defect caused to any product as a result of water flooding or any other acts of nature.
12. There are no representations or warranties of any kind by Sealite or any other person who is an agent, employee, or other representative or affiliate of Sealite, express or implied, with respect to condition of performance of any product, their merchantability, or fitness for a particular purpose, or with respect to any other matter relating to any products.

Limitation of Liability

To the extent permitted by section 68A of the Trade Practices Act 1974 (Cth), the liability of Sealite Pty Ltd under this Warranty will be, at the option of Sealite Pty Ltd, limited to either the replacement or repair of any defective product covered by this Warranty. Sealite will not be liable to Buyer for consequential damages resulting from any defect or deficiencies.

Limited to Original Purchaser

This Warranty is for the sole benefit of the original purchaser of the covered product and shall not extend to any subsequent purchaser of the product.

Miscellaneous

Apart from the specific warranties provided under this warranty, all other express or implied warranties relating to the above product is hereby excluded to the fullest extent allowable under law. The warranty does not extend to any lost profits, loss of good will or any indirect, incidental or consequential costs or damages or losses incurred by the purchaser as a result of any defect with the covered product.

Warrantor

Sealite Pty Ltd has authorised distribution in many countries of the world. In each country, the authorised importing distributor has accepted the responsibility for warranty of products sold by distributor. Warranty service should normally be obtained from the importing distributor from whom you purchased your product. In the event of service required beyond the capability of the importer, Sealite Pty Ltd will fulfil the conditions of the warranty. Such product must be returned at the owner's expense to the Sealite Pty Ltd factory, together with a photocopy of the bill of sale for that product, a detailed description of the problem, and any information necessary for return shipment.

Other Sealite Products Available



**Marine Lanterns
(1-12nm+)**



**Monitoring
& Control Systems**



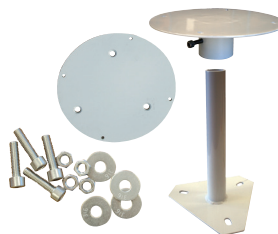
Bridge & Barge Lights



**Marine Buoys
(up to 3mt in diameter)**



Area Lighting



**Mooring Systems
& Accessories**



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