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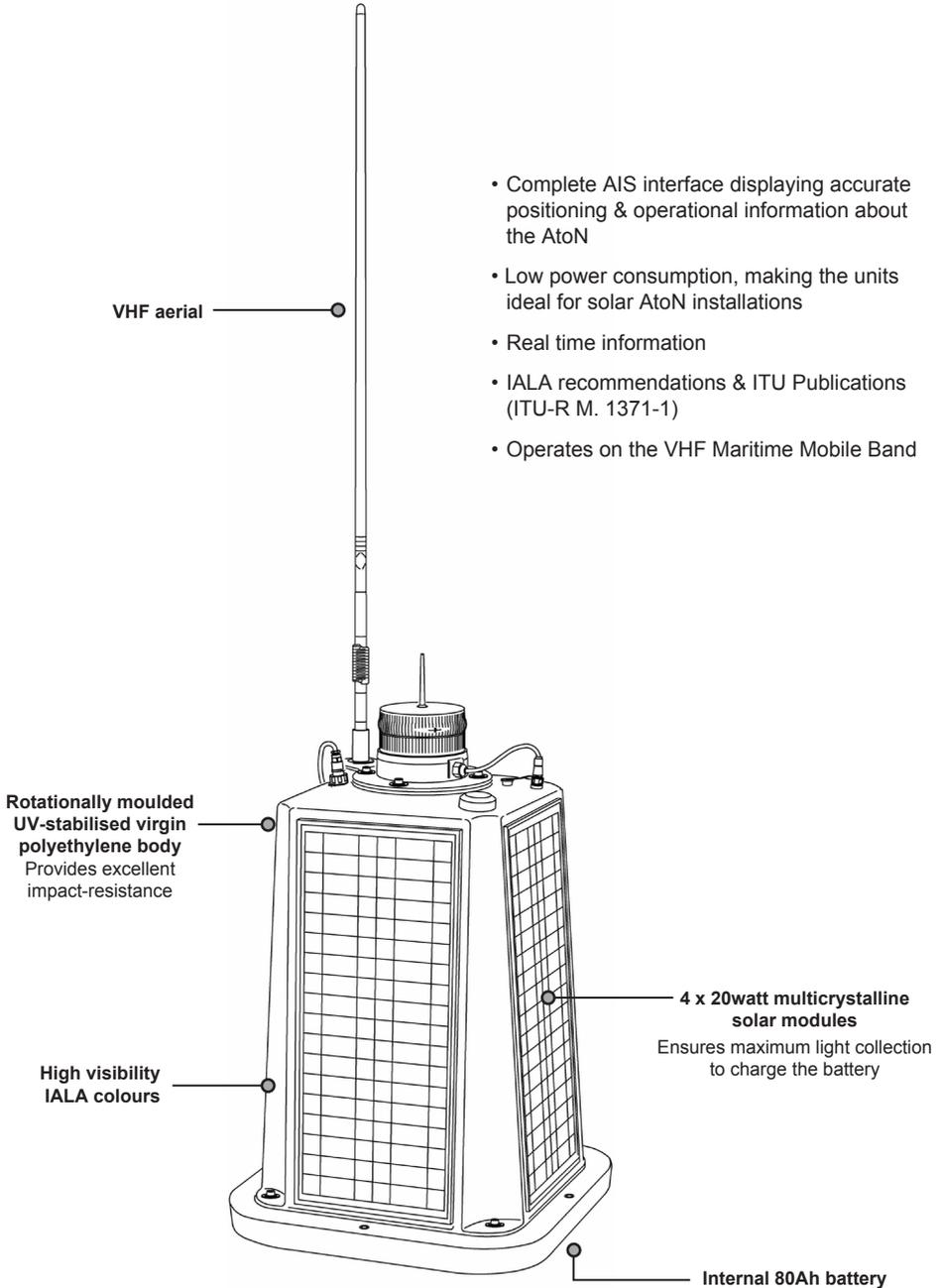
Quality  
ISO 9001  
SAI GLOBAL

# AIS Monitoring System

with SLC600 Power Supply  
Installation & Service Manual

Version 1.0

## AIS Monitoring System



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| Version No. | Description   | Date          | Approved |
|-------------|---------------|---------------|----------|
| 1.0         | Manual Launch | 4 August 2009 | K. Paton |

## 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 20 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 **ISO 9001:2000** 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

### 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 and superior quality.

### Optical Performance

Sealite manufactures a range of marine LED lenses moulded from multi-cavity dies. Complex shapes such as the SL70 lens 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.

# AIS Monitoring System

*The Automatic Identification System (AIS) is a broadcast system which operates in the VHF maritime mobile band. It is capable of sending ship or AtoN (Aid to Navigation) information such as identification, position, course, speed and more to other ships and to shore. A special access technology is used to allow rapid update rates for multiple reports within the otherwise limited capabilities of VHF.*

*Welcome now to the world of AIS monitoring. Our integration of AIS technology will provide position and name data to your personal AIS station and to other authorized AIS users. All light operational data is provided for your personal AIS station alone. Other optional data can be made available such as meteorological information at your AtoN.*

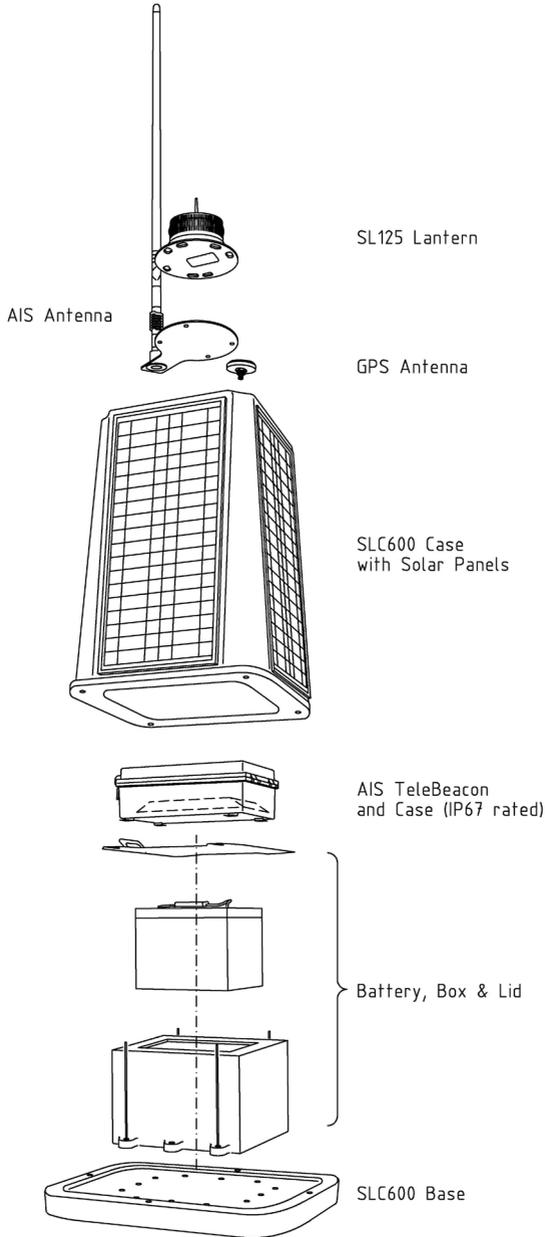
*Tracking a drifting buoy or monitoring the status of a lantern has never been easier.*

*The Sealite AIS monitoring system is built around Sealite's proven SL125 lantern. The robust TeleBeacon-S® from Maritec provides full AIS functionality whilst the intuitive charting software of ICAN completes the winning combination.*

## Features

- Complete AIS interface displaying accurate positioning and operational information about the AtoN
- Low power consumption, making the unit ideal for solar and AtoN installations
- Real time information
- Developed in accordance with IALA Recommendations and ITU Publications (ITU-R M. 1371-1)
- Operates in the VHF Maritime Mobile Band
- Enhances situational awareness
- Reduces maintenance costs

**AIS System Components**



**Figure 1: Automatic Identification System – SLC600 Case**

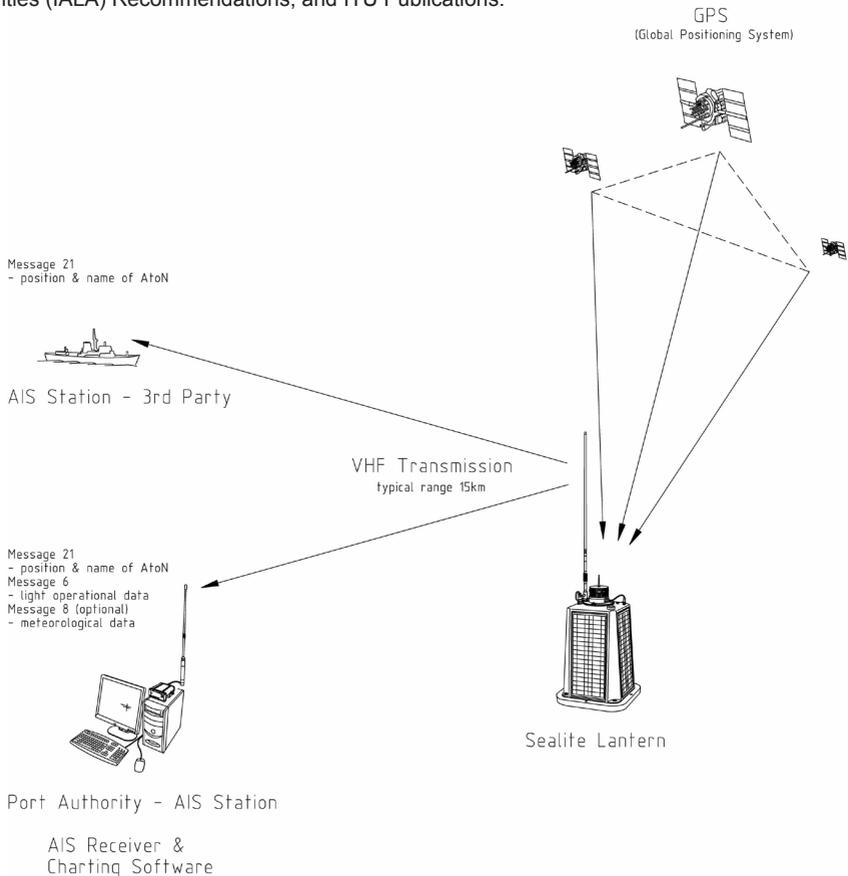
## About the AIS System

Sealite's AIS AtoN (Automatic Identification System) operates in the international VHF Maritime Mobile Band, enabling Port Authorities and other users to remotely monitor the real-time status of their AtoN installation, whilst providing mariners in the broadcasting region crucial Message 21 information (as defined by the international Telecommunications Union (ITU)) about the navigation aid.

The compact AIS AtoN TeleBeacon comes installed with Sealite's range of SL125 products and interacts with any AIS - enabled chart or radar screen, broadcasting information about the type and name of the AtoN and GPS position.

In addition, the AIS AtoN broadcasts AIS Message 6 - enabling the operator to monitor the AtoN for solar and battery voltage, flash setting and light status. Subject to the fitting of appropriate measuring devices, meteorological data and a host of other parameters can be obtained via Message 8. This fixed frequency telemetry unit operates on the designated AIS1 and AIS2 channels.

In technology partnership with Maritec Ltd, the AIS Telebeacon can be supplied integrated to the SL125 Type2 Complete or SLC600 power supply models - creating a completely integrated AIS - enabled AtoN. Sealite's AIS AtoN was developed in accordance with the International Association of Lighthouse Authorities (IALA) Recommendations, and ITU Publications.



**Figure 2: Automatic Identification System - Overview**

# Installation and Assembly Instructions

Installation of the AIS Monitoring System includes the following steps:-

- Unpacking
- Initial Inspection
- Installing the AIS base unit (case)
- Assembly

## Unpacking instructions

Unpack all hardware and verify all components are in accordance with Figure 4, the SLC600 system. Please contact your Sealite office if there is any hardware missing.

## Initial Inspection

Inspect all hardware for damage. If there is any damage, please contact your Sealite Office. Retain original packing material for possible future use in shipping the AIS Monitoring System.

## Assembly with SLC600 Case

Assembly of the factory supplied SL125 AIS System requires the following:-

- Installation of SL125 Lantern with mounting plate/GPS Antenna
- Installation of VHF Antenna
- Wiring of Lantern and Antennae
- Installation & wiring of battery
- Assembly of SLC500/600 Case

## Installation of SL125 Lantern with Mounting Plate

Tools required:

1 x 6mm Allen Key

1 x Large Flat Blade Screwdriver

1 x Small Flat Blade Screwdriver

- Remove the Flash Adjustment Plug from the base of the Lantern using the Large Flat Blade Screwdriver. For details, please refer to the SL125 Installation Manual
- Set the Flash Code and the Intensity using a Small screwdriver. For details of the Flash Codes tables please refer to the SL125 Installation Manual.
- Replace the Flash Adjustment Plug and secure tightly.
- Remove the 4 x M8 Socket Head Cap Screws from the mounting plate on top of the SLC600 Solar Housing.
- Position the Sealite SL125 lantern on to the mounting plate. Remember to position the lantern with the power cable exiting near the lantern power connector.
- Secure the Lantern using the 4 x M8 Socket Head Cap Screws.
- Remove the protective caps from both the Lantern and the Solar Panel Housing.
- Connect the Lantern and secure tightly.

### Installation of VHF Antenna

Tools required:

1 x 5mm Allen Key

1 x 10mm spanner or small wrench.

- Remove the wing nut from the screw that is holding the antenna base plate in place.
- Feed the antenna cable through the hole in the arm and position the antenna.
- Secure the antenna using 3 x M6 Countersunk Cap Screws and Nylock nuts.
- Remove the protective cap from the antenna plug on the Solar Panel Housing and connect the antenna. Secure tightly.

### Connection of Light, Antenna and GPS Cables

- Remove the M8 Socket Head Cap Screws from the corners of the Solar Panel Housing.
- With the help of an extra person, lift the SLC600 case off its base. Be careful when laying the Housing over that you do not damage the Antenna, Lantern or Solar Panel.
- Check the cable running from the GPS antenna, AIS antenna and SL125 Lantern are connected connected to the AIS Telebeacon Case. See Fig 3 for details.
- All connections are tested at Sealite before the product is packed.

**Note:** Do not fit the Solar Panel Housing until the battery is connected. See *Battery Connection* section of this manual

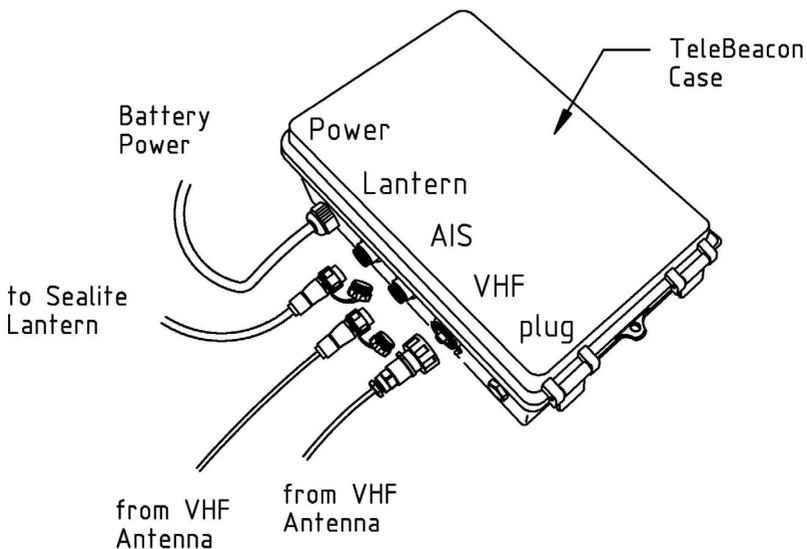


Figure 3: Lantern & Antenna Cables

## **Battery Connection**

Tools required:

- 1 x Allen Key, 6mm
- 2 x 10mm spanners or small adjustable wrenches.
- 1 x extra person for lifting.

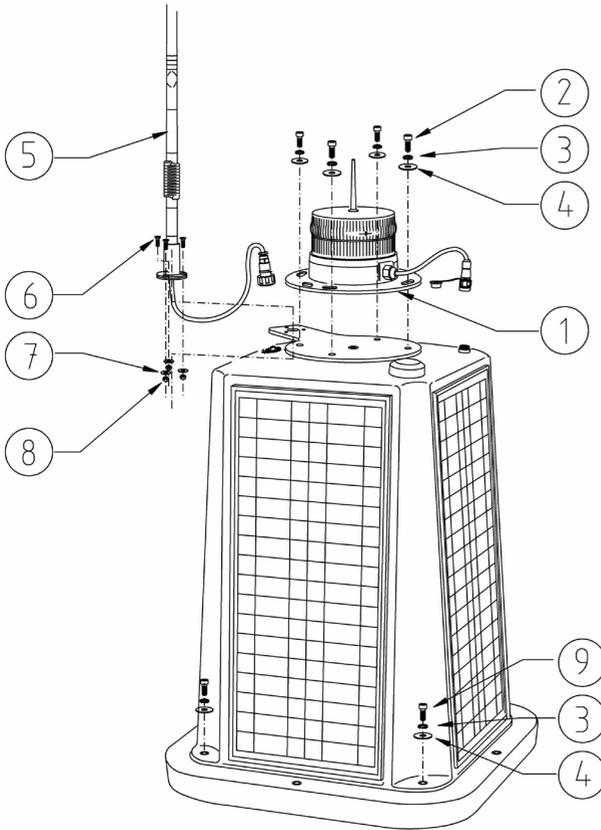
The cover is already removed. (see *Connection of light, Antenna and GPS Cables* section of this manual

- Unscrew the 4 x Hand-Wheels from the corners of the Battery Box Lid.
- Connect the Negative wire to the Negative Battery Terminal. Always connect Negative First!
- Connect the Positive wire to the Positive Battery Terminal
- Replace the Battery Box Lid and secure with the 4 x Hand-Wheels.
- Replace the Solar Panel Housing and secure using the 4 x M8 Socket Head Cap Screws and Washers.

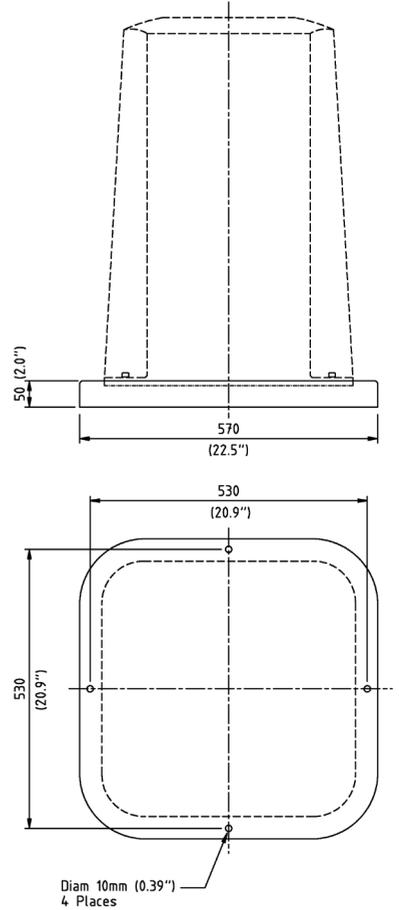
## **Testing Lantern Operation**

- Place a dark towel or jacket over the lantern.
- When the lantern detects darkness a Indicator LED on the circuit board will start flashing.
- After 30 seconds of continual darkness the lantern will start operating.

For further information please refer to the Sealite SL125 Operator's Manual.



**Figure 4: Installation of SL125 Lantern and Antenna**



**Figure 5: Mounting Hole Dimensions**

| No | Description                     | Qty |
|----|---------------------------------|-----|
| 1  | Sealite Lantern, SL125          | 1   |
| 2  | M8 x 30mm Socket Head Cap Screw | 4   |
| 3  | M8 Spring Washer                | 8   |
| 4  | M8 Penny Washer                 | 8   |
| 5  | AIS Antenna, (VHF)              | 1   |
| 6  | M6 x 25mm Countersunk Cap Screw | 3   |
| 7  | M6 Flat Washer                  | 3   |
| 8  | M6 Nut                          | 3   |
| 9  | M8 x 40mm Socket Head Cap Screw | 4   |

## How to Set-up and Program the AIS Unit

All AIS units will be supplied pre-programmed with the information supplied by the customer. This will include both Latitude and Longitude and the unique Maritime Mobile Service Identity (MMSI) number. The MMSI number is allocated by the relevant Maritime Safety Authority in each country.

The Sealite AIS uses a Maritec Telebeacon as the transmission source back to the base station.

**Note:** Programming of the AIS is only briefly outlined in this short note. For a full explanation of ALL the required parameters refer to the Telebeacon-S, Operational and Technical Manual. Contact Sealite for all information.

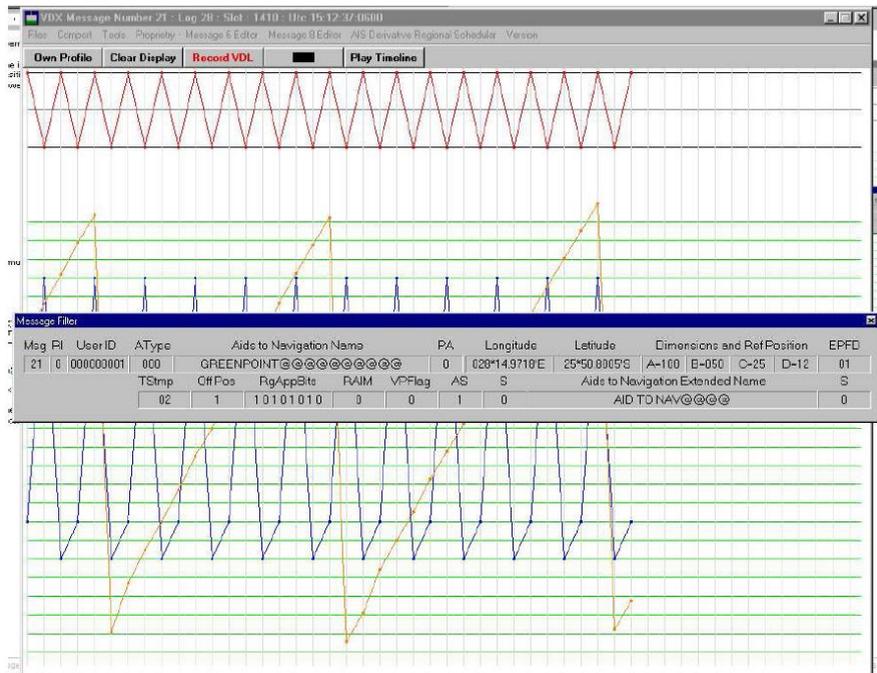
### Programming the Remote AIS

Tools required:

1 x Laptop or PC with supplied "Utility" software loaded.

1 x RS232 cable and short adaptor cable (supplied) between PC Com Port and the 9 pin connector located in the AIS enclosure.

- Open the cover on the watertight box housing the AIS transmitter.
- Connect the RS-232 cable to the and the RS-232 connector port located in the box
- Apply 12V DC power to the AIS.
- Run the "Utility" software. The window shown below will appear.
- Select 'Comport' on the task bar and configure the PC to the appropriate Com port (Com1, Com2, ...)
- Select "baud rate - 38400 - comport x"
- Select "Own Profile" on the lower task bar. The window shown below will appear. Fill out the required data fields including the allocated MMSI number.
- Press 'Write To TeleBeacon'
- Wait for 'Write' to complete.



### Check Up-loaded Information

- Turn power OFF to the AIS unit;
- Wait 5 seconds and turn power ON to the AIS unit;
- Select the required Com Port - Baud Rate = 38400.
- Select 'Own Profile', select 'Read From TeleBeacon'
- Wait for 'Read' to complete
- The displayed window should show the previously data programmed into the TeleBeacon
- For full details refer to the complete TeleBeacon- S manual.

## Testing the AIS Transmitter

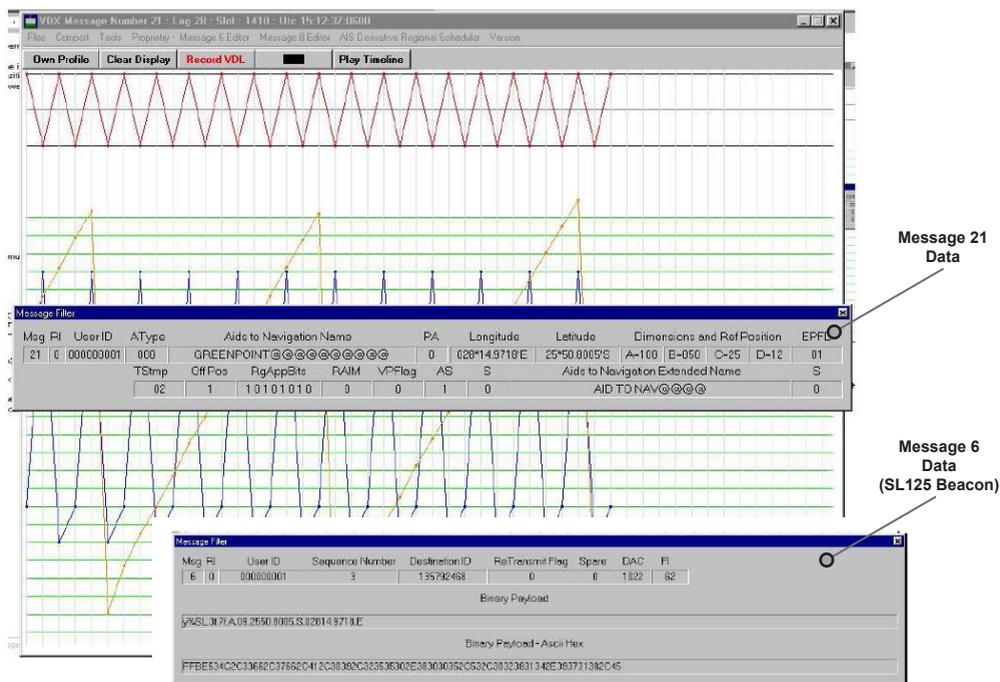
Local Testing of the Remote AIS (Requires an appropriate AIS Receiver with an RS-232/USB output and a PC connected to the receiver data output.

Do not place the AIS transmitter and receiver too close together. If this is not practical, use 50-Ohm dummy antenna's.

The AIS unit needs to be powered up and located outside to pick up the GPS signals required. The unit will NOT operate if there is no GPS signal.

- Connect the AIS unit to a PC or Laptop as above.
- Select the required Com Port - Baud Rate = 38400.
- Power the AIS and Sealite SL125 ON.

A graph similar to that shown below will begin to appear on the main screen window as shown below. Clicking on each "DOT" on the screen will display the relevant message data.



The AIS unit transmits Message 21, Message 6 and Message 8.

Transmission intervals are ultimately determined by the appropriate MMSI number allocated to each unit.

For additional information refer to the Telebeacon- S manual.

### **AIS Display Software**

There are number of AIS software packages available to display vessel traffic and Aids to Navigation data.

Your AIS receiving software package will need to be adapted to interpret Message 6 data that is Sealite specific to the SL125 Beacon.

Presently the only software that has been written to accept the SL125 beacon data is ICAN Marine Horizon Vista AIS package. For further information, please consult Sealite.

## Trouble Shooting

| Problem  | Remedy   |
|--|--|
| Lantern will not activate.                     | <ul style="list-style-type: none"> <li>• Ensure lantern is in darkness.</li> <li>• Wait at least 60 seconds for the program to initialise in darkness.</li> <li>• Ensure switch setting is on a valid code (not unused flash code).</li> <li>• Ensure battery terminals are properly connected.</li> <li>• Ensure battery voltage is above 12volts.</li> </ul>   |
| Timing codes will not change.                  | <ul style="list-style-type: none"> <li>• Turn rotary switches several times to ensure contacts are clear.</li> </ul>   |
| Lantern will not operate for the entire night. | <ul style="list-style-type: none"> <li>• 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.</li> <li>• Reducing the light output intensity or duty cycle (flash code) will reduce current draw on the battery.</li> <li>• Ensure solar module is clean and not covered by shading during the day.</li> </ul> |

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



**Notes**

## Sealite Lantern Warranty V1.0

### 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.au**

***Sealite Pty Ltd will repair or replace your lantern 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 rotationally-moulded buoy products ("Buoy 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 Sealite marine products other than the Telemetry Products, BargeSafe™ Products, and Buoy 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.
5. Sealite Pty Ltd will repair or replace, at Sealite's sole discretion, any Telemetry Products, BargeSafe™ Products, Buoy 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.
6. If any Telemetry Products, BargeSafe™ 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.

### 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.

### 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  
(1-7nm)**



**Monitoring  
& Control Systems**



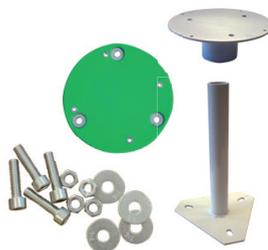
**Bridge & Barge Lights**



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



**Area Lighting**



**Mooring Systems  
& Accessories**



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