Solar Obstruction/ Barricade Light - Low Intensity

AV-OL-75

Installation & Service Manual - V2.0

Avlite®

"We Believe Technology Improves Navigation."

Manual Update Register

Version No.	Description	Date	Reviewed	Approved	Design
2.0 (Current)	AV-OL-75 Product Update	August 2021	P. Naidu	W. Evans	M. Sugars
1.0	AV-OL-75 Manual Launch	August 2017	A. Dixon		

Solar Obstruction/ Barricade Light - Low Intensity
AV-OL-75

Contents

1.0 Introduction

Congratulations! By choosing to purchase an Avlite light, you have become the owner of one of the most advanced solar LED airfield lights in the world.

Avlite Systems draws on more than 25 years experience in the design and manufacture of navigation aids, and particular care has been taken to ensure your light gives years of trouble free service.

As a commitment to producing the highest quality products for our customers, Avlite has been independently certified as complying with the requirements of ISO 9001:2015 quality management system.

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

Please remember to complete the Avlite warranty registration at www.avlite.com.

2.0 Technology

Avlite Systems is a world-class solar lighting systems manufacturer with a proven reputation for rapid, innovative, and agile technology solutions designed specifically for defence, government, civil and humanitarian aid operations in the most remote, toughest environments.

Electronics

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

LED Technology

All Avlite lights 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 Avlite products are of a consistent and superior quality.

Optical Performance

Avlite manufactures a range of aviation LED lenses moulded from multi-cavity dies. The company has superior in-house lens manufacturing capabilities to support outstanding optical performance.

Award-winning, Patented Technology

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

3.0 AV-OL-75 Model

The AV-OL-75 is the smallest and lightest ICAO Type A Low Intensity Obstruction light on the market. The light produces in excess of 10cd and is suitable to mark aerial obstructions up to 45mtrs in height.
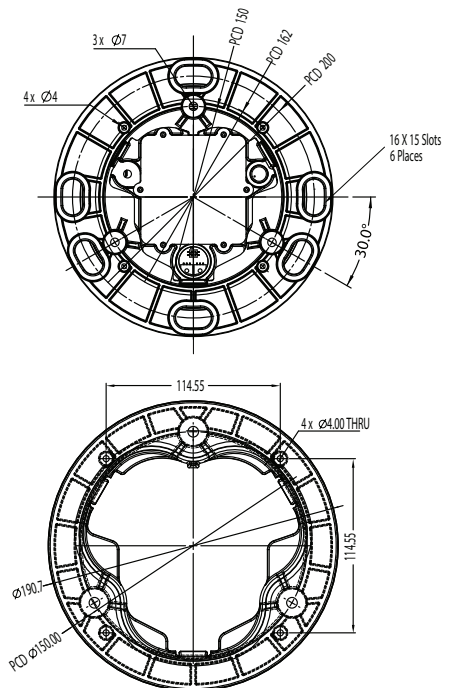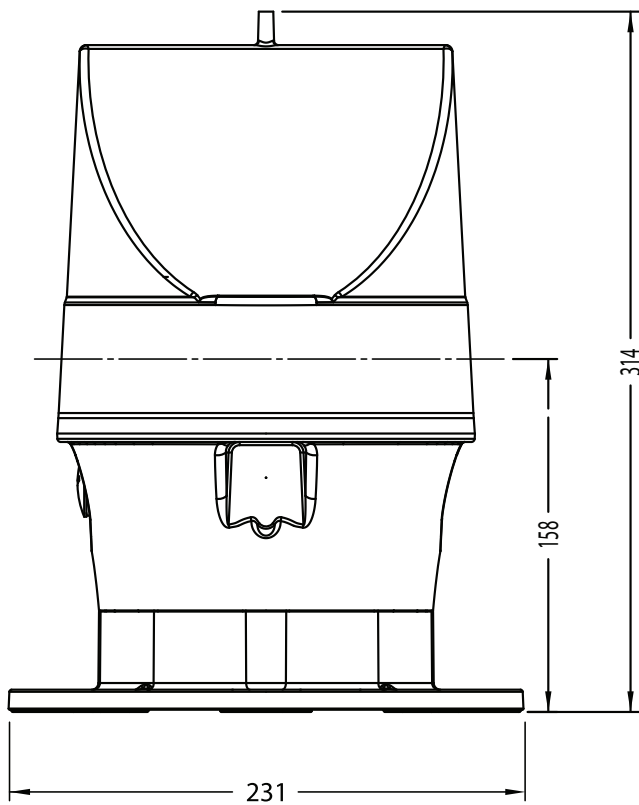
As standard, the AV-OL-75 is equipped with Bluetooth® connectivity for convenient servicing via the AvlitePro™ mobile application from a distance of up to 50 meters. Operators save time, maintenance costs and increase safety of personnel by maintaining the light without leaving the ground.

The model utilises a tilted solar array which charges the internal 17.2Ah (B2 only), 21.5Ah (B3 only) or 28.8Ah (B4 only) battery during daylight hours. Supplementary battery charging is available via the optional external charge port. In addition, each fixture is also available with an optional external switch.

Mounting accessories can be purchased from Avlite or may also be user supplied. The four hole bolt pattern will fit directly onto any 200mm outside diameter (OD) mount.

3.1 Available Options

- SATCOM Connectivity

- GSM Monitoring

- External On/Off Switch

- Charge Port

314

158

231

3 x Ø7

PCD 150

PCD 162

PCD 200

4 x Ø4

16 X 15 Slots
6 Places

30.0°

114.55

4 x Ø4.00 THRU

114.55

Ø190.7

PCD Ø150.00

4.0 AV-OL-75 Data Sheet

AV-OL-75	B2	B3	B4
Light Characteristics			
Light Source	LED		
Available Colours	Red		
Minimum Intensity	Complies with ICAO Type A		
Available Operation Modes	Stand by, steady-on, dusk till dawn		
LED Life Expectancy (hours)	>100,000		
Electrical Characteristics			
Operating Voltage	3.6		
Temperature Range	-40 to 80°C		
Solar Characteristics			
Solar Module Type	Monocrystalline		
Output (Watts)	5 (2 x 2.5 Watts)		
Charging Regulation	Microprocessor controlled		
Power Supply			
Battery Type	Nickel Metal Hydride (NiMH)		
Battery Capacity (Ah)	17.2	21.5	28.8
Nominal Voltage (V)	3.6		
Operating time at maximum intensity (without Satcom)	213 hours	266 hours	356 hours
Physical Characteristics			
Body Material	LEXAN® Polycarbonate – UV stabilized		
Lens Material	LEXAN® Polycarbonate – UV stabilized		
Lens Diameter (mm/inches)	140 / 5 ½		
Lens Design	TIR		
Mounting	6 x 17 mm holes on 200mm PCD		
Height (mm/inches)	313 / 12 ⅓		
Height (mm/inches) SATCOM	364 / 14 ⅓		
Width (mm/inches)	231 / 9 ⅛		
Mass (kg/lbs)	2.35 / 5 ⅙	2.55 / 5 ⅝	2.93 / 6 ½
Mass with Satcom (kg/lbs)	2.55 / 5 ½	2.7 / 6	3.08 / 6 ¾
Service Life	12 years plus		
Environmental Standards			
Shock	MIL-STD-202G, Test Condition G, Method 213B		
Vibration	MIL-STD202G, Test Condition B, Method 204		
Wind Speed	Up to 160kph / 100mph		
Humidity	0 to 100%, MIL-STD-810F		
Compliance			
CE	EN61000-6-4:2019 EN61000-6-3:2019		
Quality Assurance	ISO9001:2015		
ICAO	Low Intensity Obstruction Light Type A		
Waterproof	IP68		
Trademarks	AVLITE® is a registered trademark of Avlite Systems		
Other			
Warranty *	3 years		
Options Available	Satcom Connectivity, GSM Monitoring, External On/Off Switch, Charge Port		
Terms and Conditions	Please refer to the light installation manual for further specifications. Warranty Terms and Conditions - www.avlite.com		

5.0 Safety Information

Before proceeding with installation or service, make sure the following conditions are met:

• Ensure power lines are not 'live' (NO ELECTRICAL HAZARD)

• Avoid touching live circuits!

• Avoid touching any component or any part of the circuitry while the unit is operating. Do not change components or make adjustments inside the unit with power on.

• Make sure the light fixture mounting is vertically aligned to guarantee the required beam pattern of the airfield light.

• Make sure any nearby obstacles do not impede the lights' beam pattern.

• When installing, comply with all local electrical code(s).

• Mains power should always be disconnected when work is being done in close proximity to electrical fittings, and electrical work should only be done by a licensed electrician.

• Operate the light only within the indicated electrical ratings and product usage instructions.

• To ensure that the light and peripheral equipment function safely and correctly, use cable in compliance with the effective local electrical code.

• Do not stare at the LED or shine the LED into your eyes or those of another person.

• Dispose of the product according to the local laws and regulations for your region, for example, at a recycling centre that accepts electronic devices.

6.0 Operation and Setup

Avlite's AV-OL-75 is a robust, completely self-contained solar powered LED light. The solar module of the light converts sunlight to an electrical current that is used to charge the battery during daylight hours. The battery provides power to operate the light at night.

External ON/OFF Switch

The light is fitted with an external ON/OFF switch at the base of the unit. The ON/OFF switch may be useful if the unit is only required for short periods (i.e. it is being moved or needs to be stored often), and disconnecting the battery is not viable.

External Charge Port

The charge port is also found at the base of the unit. This can be used to recharge the battery or directly power the light fixture in a wired installation. Please see AV-OL-75 Long Term Battery Storage & Maintenance.

Optional External ON/OFF switch

Charge Port

6.1 Activation

Automatic Solar Charging

New lights should be left in the sun for several days to ensure battery is charged before placing in service.

Charging the Battery

The AV-OL-75 contains an integrated solar/battery charging system which allows them to run on solar power. The AV-OL-75 fixtures will charge automatically when placed in sunlight. In addition, the AV-OL-75 can also be fitted with a charge port on the base of the unit that can be used to manually charge the battery.

Preferred Installation Location

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

6.2 Turning Light On/Off

Light Base

User Replaceable Battery
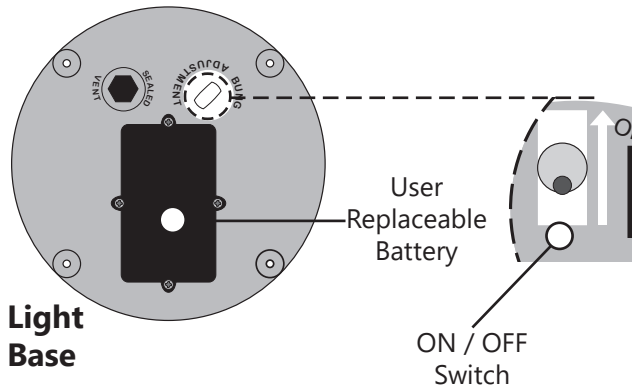
ON / OFF Switch

Lantern Operation

The AV-OL-75 can be activated either via the internal toggle switch or via the external on/off switch if fitted. It can then be operated via Bluetooth utilising the AvlitePro mobile application

1. Remove the marked bung (refer to the image below) from the base of the light using the provided switch key and set internal toggle switch to 'ON'. Alternatively, flick the External Switch to 'ON' if fitted

2. A sealed vent on the base allows air transfer without moisture intake, and should not be disturbed.

3. To test the light operation, place a dark cover (such as a towel or jacket) on top of the light to activate the sensor. The light will turn on within one minute. The operation of the light can also be tested via Bluetooth using the AvlitePro mobile application.

4. Ensure that the unit is bolted to an even, flat surface.

6.3 Optional GSM

The lights may also be fitted with GSM Cell-Phone Monitoring and Control – enabling users to access realtime diagnostics data and change light settings via cell-phone. The system can also be configured to send out alarm SMS text messages to designated cellular telephone numbers. Users can also have alarms and reports sent to designated email addresses via Star2M®.

Installing the Sim Card

1. Unscrew the Bung on the side of the light, to gain access to the GSM compartment.

2. Gently insert the SIM into the holder. Make sure the SIM Card is positioned correctly.

3. Screw the bung back into place. Make sure the bung is tightly secured in order to seal properly.

6.4 Optional Satcom

You can activate your Satcom enabled AV-OL-75 via Star2M®. This will require the IMEI number on your fixture to be added as an asset to your Star2M® plan. For more information, visit www.star2m.com.

7.0 Bluetooth® via AvlitePro™

The Avlite AV-OL-75 Bluetooth® Control System accessible via the AvlitePro™ App is divided into six simple sections, as outlined below and displayed on the App home screen

- **Light Information:** Light identification, Light name, Security Pin, Battery Option

- **Light Status:** Battery Voltage with display, Battery health status, Geolocation

- **Solar Calculations:** Solar Calculator Options, Solar Charge, Autonomy, Hibernation mode

- **Programming Options:** Light Type Selector, Operating Mode (Always On, Dusk to Dawn & Standby)

- **Power Monitoring:** Minimum & Maximum Voltage for last 24 hours, Load Current for both last hour and last 24 hours, Charge Current for both last hour and last 24 hours.

- **Manufacturing Data:** Hardware version, Light serial number, Manufacture Date, Software version, Battery Last Changed Date, Date of Last Service

7.1 Accessing the AvlitePro™ App

**Opening the AvlitePro™ App on an Android or iOS Device**

1. Download the AvlitePro™ App from Google Play (search for "Avlite" store) on an Android Tablet or Smartphone or via the App store on an iOS tablet or phone.

2. Open the App to prompt the Avlite Bluetooth control program.

Start Menu

- Home – brings you back to the home screen

- Connect via Bluetooth - connect to a light.

- Solar Calculator – Used to conduct simulations based on locations. NOTE – This feature provides light simulations only in regards to battery autonomy on solar radiation. Changes may be applied through "Connect via Bluetooth" option only.

- User Guides – User Manual

- Contact Avlite / Us – Provide product feedback and contact Avlite.

Scan for Lights

- When the "Connect via Bluetooth" option is selected, the app will automatically scan for lights equipped with Bluetooth within range.

- It will only communicate with lights that are turned on and not 'talking' to another Bluetooth device.

- Select the light, which requires setting or verification.

Solar Obstruction/ Barricade Light - Low Intensity
AV-OL-75
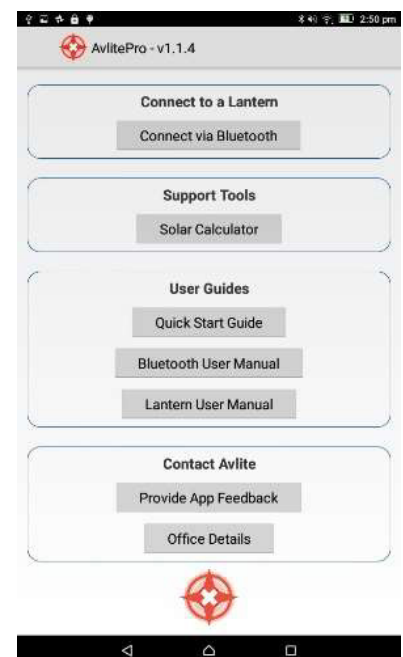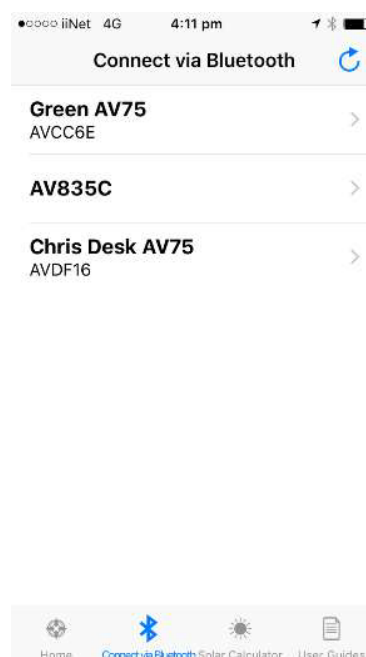
Identify Bluetooth Radio ID

- Expand the "Lantern Information" tab if collapsed.

- When "Identify" on the Tablet or phone is selected, the connected light will flash quickly 10 times.

- For iOS, identify is represented by a flash / burst icon. The connected light will flash quickly 10 times.

Light Name

- Press "Name" to change the light name. A user defined name, comprising up to 16 alpha- numeric characters (and -, $, #,@) can be typed into the dialogue box. It is recommended that the light be programmed with a unique name.

- Press tick and then Set or Apply to confirm.
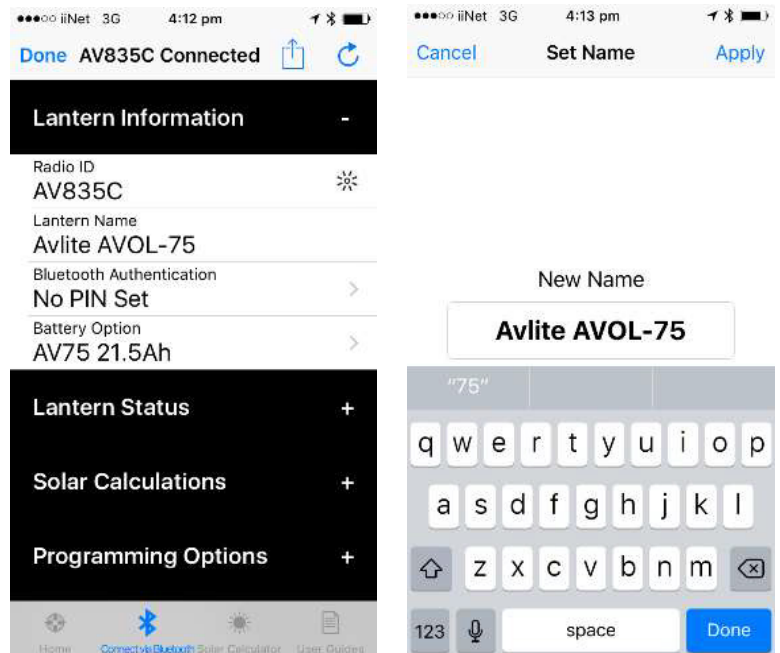
Bluetooth Authentication or Setting a PIN

- The factory default does not set the light with a security PIN. In order to set a PIN, select "Authentication Level" ("Bluetooth Authentication for iOS") then enter a New PIN and press "OK". A confirmation of the PIN will be prompted. Reenter the same PIN and press "OK".

Modify current security access PIN

- To set a new security access PIN select "Authentication Level" ("Bluetooth Authenticationfor iOS") and type the current security PIN. After validation, the app will request for the current PIN to be re-entered. After confirmation enter the new security PIN then confirm the new PIN. Note - If the Security PIN is lost, go to Page 22 for Password Reset Procedure.
  NOTE - The PIN '0000' is reserved and will result in the light having no PIN.
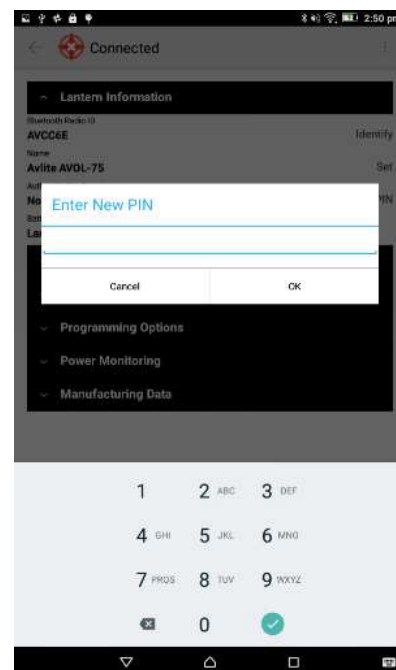
7.2 Light Status

Voltage

- Displays the Battery voltage.

Battery

Displays the Battery voltage with a simple display, so you can quickly determine the health of your battery.

- Green >60% Capacity

- Amber 60% - 20% Capacity

- Red <20% Capacity

Status Flags

This is quick reference to current state of the Light. It will display the following

- LED Fail, will display if the LED has failed.

- Day or Dark, will display when the Light Sensor determines if it is in Darkness or Daylight.

- Battery OK, Low or Flat.

- Light Sensor Failure, will display if the Light sensor has not sensed a change lux levels in 24 Hours. E.g. the Light did not 'see' two Day/Night transitions

Light Geolocation

The Location displayed is taken from your device's own GPS location.

- By clicking on the location or arrow you can move your location to another part of the world.

- This location is used for determining the Solar Calculations.

- Note- Android only - Select a location globally to estimate the light's autonomy if installed at that location.

Solar Obstruction/ Barricade Light - Low Intensity
AV-OL-75
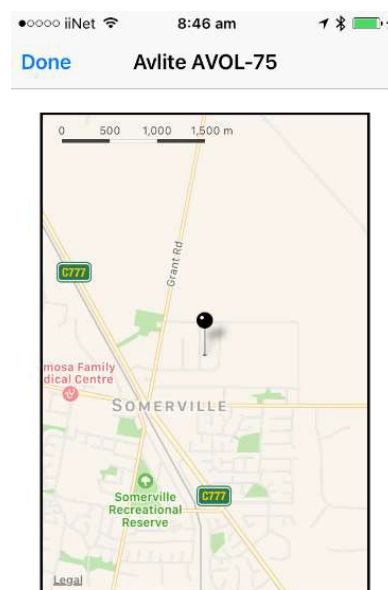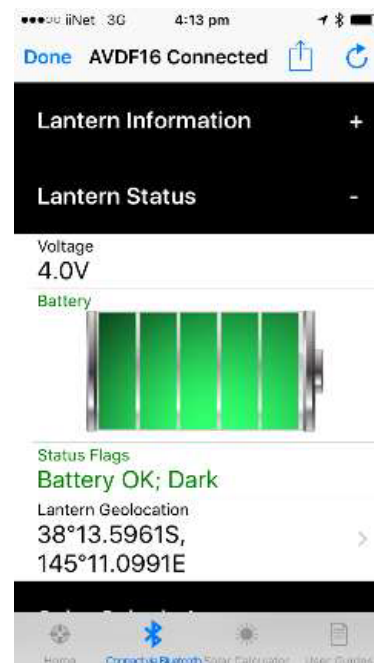
7.3 Solar Calculations

Solar Calculation Options

When selected the customer can add options, such as GSM, which will affect the current consumption of the Light.

Solar Charge

This function estimates if there is enough 'sunlight hours' throughout the year to keep the Light's battery fully charged.By pressing the graph symbol, you will see a display showing Charge Gain, Consumption and Extra Charge for a three-year period.

- Solar Charge will be shown in Green if there is sufficient solar charge to replenish the battery.

- Solar Charge will be shown in Red if there is insufficient solar charge to replenish the battery.

Autonomy

- This function estimates the light autonomy based on the Light settings and geolocation. By pressing the graph symbol, you will see a display showing Battery autonomy throughout a three-year period:

- The autonomy is displayed, showing the Best, Mean or Average and Minimum number of days the unit will work.
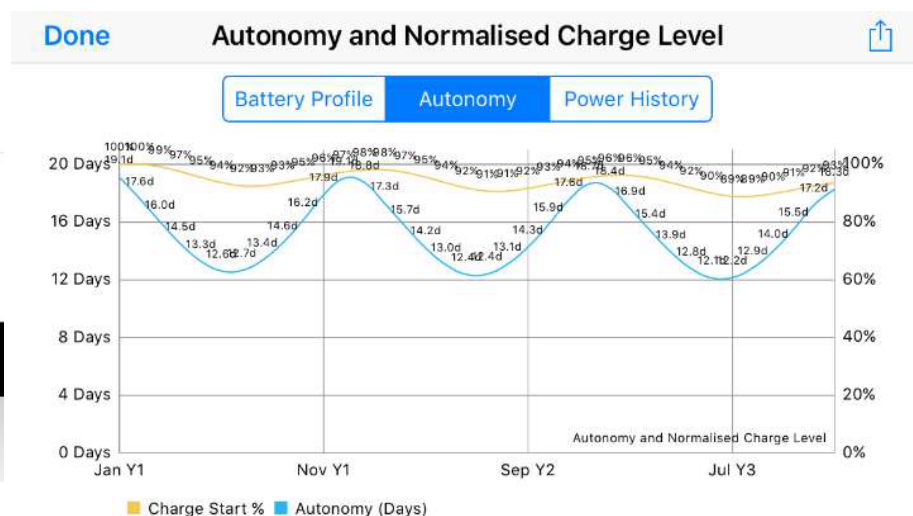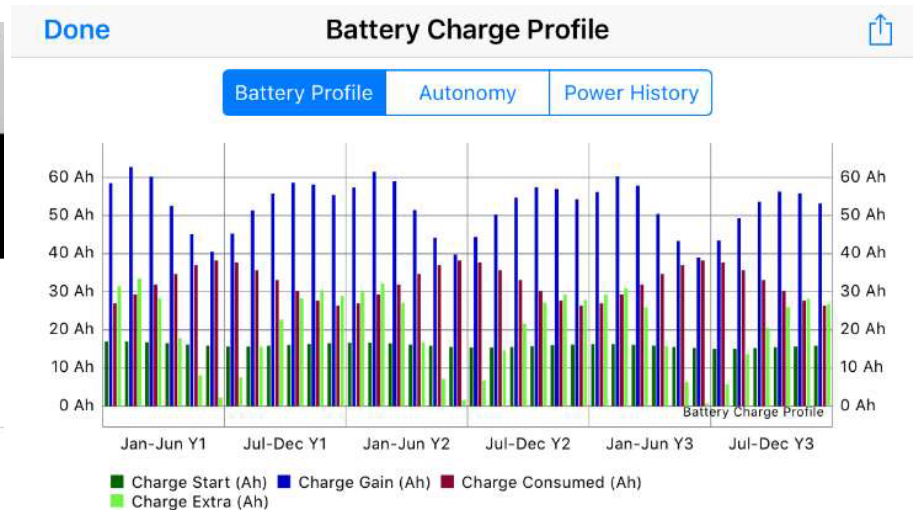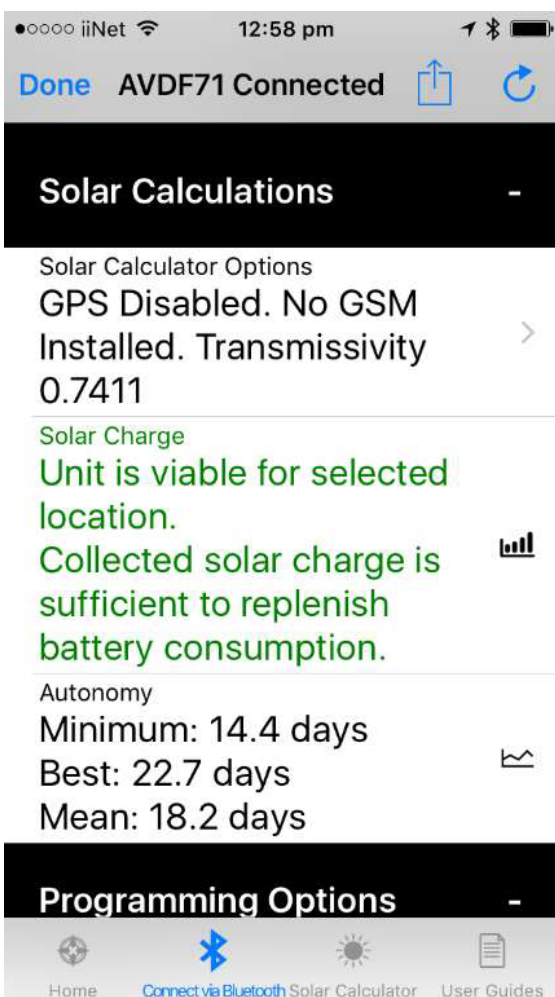
7.4 Programming Options

Light Type

The Light is configured to comply with the requirements for ICAO Low Intensity Type A Obstruction Lights.

Operating Mode

To change the Operating Mode press the Operating Mode field and then select one of three available options:

- Standby - The light is configured in a minimum current state in which the LEDs are always off

- Always on – The daylight sensor is disabled and the light operates 24/7

- Dusk till Dawn – The daylight sensor is monitored and the light will only operate at night time.

Once the Operating Mode is selected press "Set / Apply" to confirm the change.

As factory default the light is always set to Dusk Till Dawn mode.

Operation

The Light will alert the customer if a change occurs to cause the Light to stop activating in accordance with the requirements for ICAO Type A Low Intensity Obstruction Lights.

If this occurs try resetting the Light Type and adjusting the Operation Mode. Please contact your Avlite dealer for assistance if necessary.
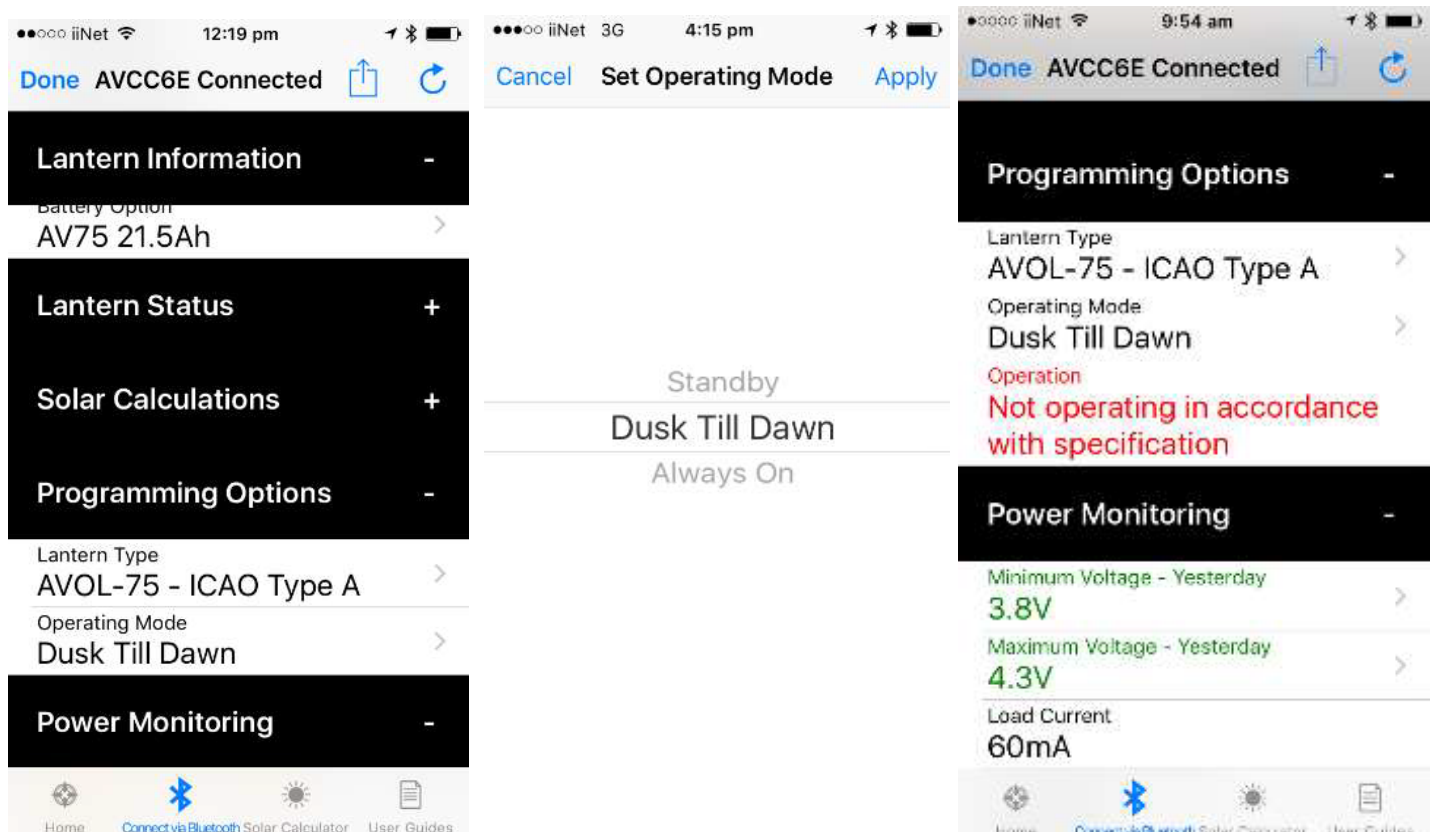
# 7.5 Power Monitoring

When Bluetooth connection is established with your light, data about the Battery, Solar Charge and Light will appear.

This will display both the instantaneous, previous hour and previous day's power usage.

In addition, by clicking on the arrow a 'Power History' graph will appear showing up to 14 days' worth of data, helping you track the lights performance over a two-week period.
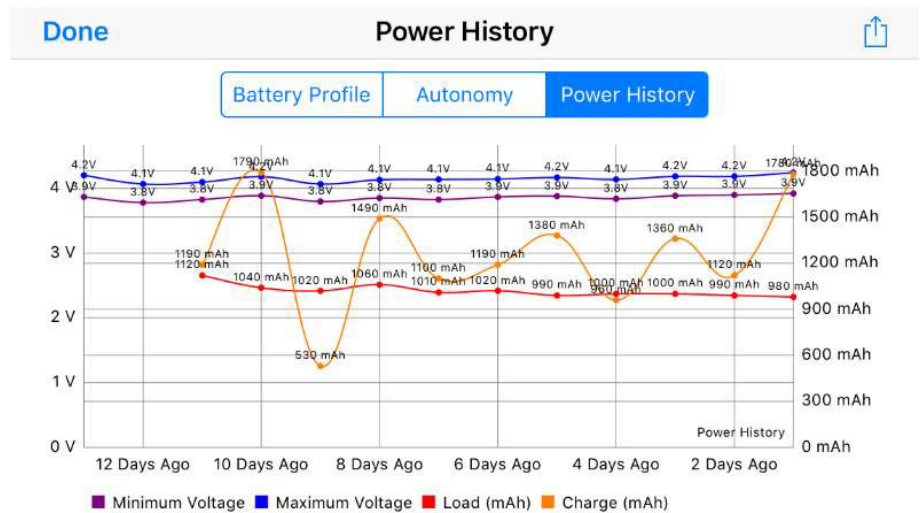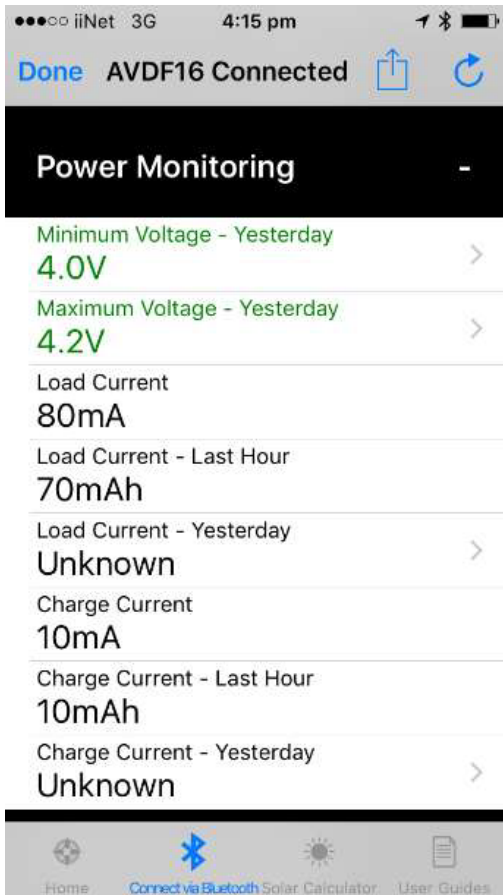
7.6 Manufacturing Data

Manufacturing Data

When Bluetooth connection is established with your light, data about the light hardware will appear on the "Manufacturing Data" tab.

Hardware

This identifies the circuit board model number

Board Serial Number

This identifies the PCB serial number

Manufacture Date

This details when the PCB was programmed.

Software Version

This tab displays the software version loaded on the PCB.

Battery Last Changed

This is a used adjustable field that alerts the customer when the battery may be due for replacement. The performance of the battery is affected by environmental conditions so please check your Light's battery performance over the previous two weeks before determining if a replacement is necessary.

- This will be shown in Green if there is more than two months before the change date.

- This will be shown in Amber if there is less than one month before the change date.

- This will be shown in Red if the change date has passed.

Date of Last Service

All Avlite AV-OL-75's are maintenance free, but some customers will have a general maintenance program running at the site. This tab allows the customer to check when the Light was last serviced and organize their maintenance procedures more efficiently.

Email

All information on the Avlite Pro App can be emailed. Just click on the icon at the top of the screen
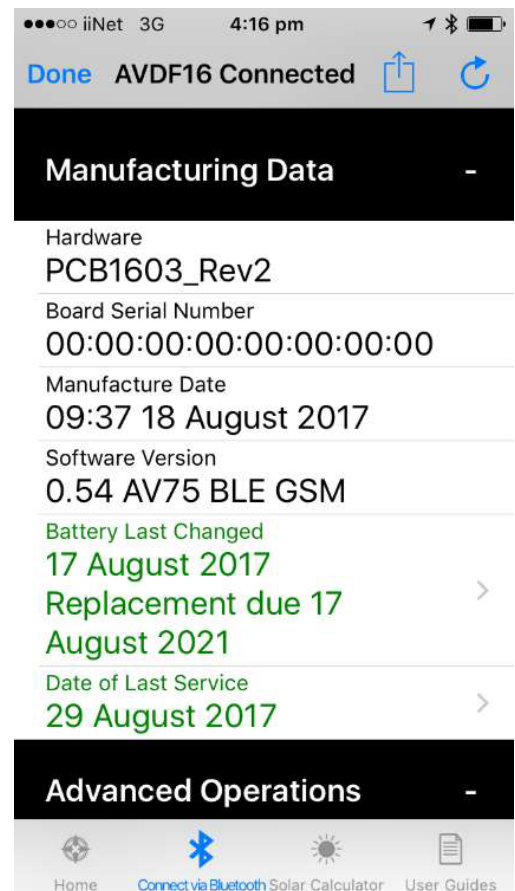
8.0 Unpacking, Installation, Wiring and Setup

8.1 Unpacking

Unpack all hardware and inspect for damage. If there is any damage, please contact your Avlite Office. Retain original packing material for possible future use in shipping.

8.2 Installation

> **WARNING:**
>
> DO NOT connect directly to an unregulated power source. Connecting to an unregulated source may result in damage.

> **WARNING:**
>
> Do not stare into light emitting diode (LED) beams.

> **WARNING:**
>
> LED lights contain glass components. Do Not Drop.
> Always follow the instructions outlined in the product manual when cleaning the equipment. Improper cleaning methods and use of unauthorized cleaning agents can damage equipment.

8.2.1 Location

For best light performance, the light fixtures should be installed in an area where the solar modules are not covered and are in clear view of the sky with no shadows.

Position the panels in an East-West orientation when within +/- 35 degrees latitude of the Equator. For locations greater than +/- 35 degrees latitude, position the panels in a North / South Orientation.

8.2.2 Factory Configuration

Pre-wired and pre-assembled AV-OL-75 solar light fixture

8.2.3 Charging the Battery

New light fixtures should be left in the sun for several days to ensure the attery is charged before placing in service.

8.3 Installation Recommendation

1. Installation of the Light Fixture

The AV-OL-75 fixture is able to be installed on any appropriately reinforced mounting point with a 200 PCD. Alternatively, the appropriate mounting accessories can be purchased separately from Avlite.

9.0 Maintenance and Servicing

Designed to be almost maintenance-free, the AV-OL-75 requires minimal attention, though the following maintenance and servicing information is provided to help ensure the life of your Avlite 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 - nspection 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 3.6 volts under 100mA load, and ensure all terminals are clear of foreign matter.

Replacing the battery

The AV-OL-75 lights are the only compact aviation light with a double sealed battery compartment. This provides the user with the ability to change the battery after years of operation. Alternatively, use the AvlitePro mobile application to determine the battery voltage.

NOTE: before carrying out the process below, please see the 'Safe Battery' section on the next page,

1. Remove the light from the mounting (if installed).

2. Turn off the fixture by either turning the external switch to the 'OFF' position (if fitted) or removing the marked adjustment bung from the base of the light and setting the internal toggle switch to 'OFF'.

3. Unscrew small screws to remove battery plate.

4. Remove battery from AV-OL-75 case and unscrew positive and negative leads.

5. Discard old battery in a safe manner.

6. Reattach positive and negative leads to new battery and then place back into case.

7. Reattach battery plate and switch light 'ON' via internal switch (or external switch if fitted). Replace the flash adjustment bung.

8. To test place dark cover (towel or jacket) on top of the light to activate the sensor, light will come on.

Care must be taken to observe the polarity of the battery before the leads are connected, and ensure the replacement battery is fitted correctly. Always discard old batteries in a safe manner.

Light Base

User Replaceable Battery
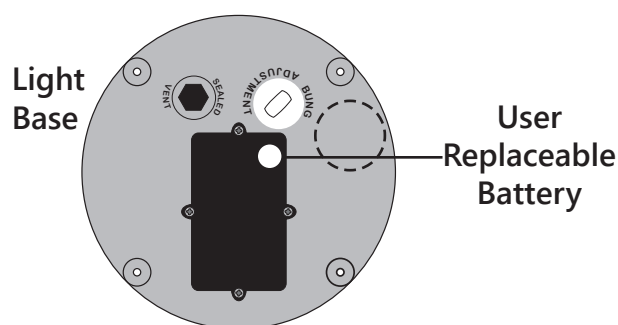
⚠️ **NOTICE:**

Care must be taken to observe the polarity of each wire before they are connected. To ensure waterproofing of the unit, make sure that there is a satisfactory seal.

Long Term Storage Instructions

If the AV-OL-75 is to be placed in storage for an extended period, being more than 5 months, please follow the below steps.

1. The 3.6V NiMH Battery must be stored in a fully charged condition.

2. Remove the Flash Adjustment plug and turn the internal ON/OFF switch to the OFF position. Alternatively, turn the external switch (if fitted) to the 'OFF' position.

3. Remove the battery cover and disconnect the Positive (+) Terminal.

4. Fold the Terminal away from the Negative Battery Terminal.

5. Replace the Battery Cover

6. Replace the Flash Adjustment Plug.

All batteries will discharge over time and the rate of discharge is dependent on temperature. If the light is being stored in temperatures greater than the optimum temperature the battery will discharge faster.

Please check battery every 2-4 months. Recharge if necessary.

Safe Battery Handling

Charging and Discharging

- Always ensure batteries are fully charged when installing new lights. The light will be dispatched from the Avlite factory fully charged. However if time has elapsed between dispatch and installation, battery voltage must be checked.

- Never short-circuit or reverse polarity of a battery, damage to the battery and device may occur, and there is a risk of fire.

- Do not use different types of batteries in the same battery assembly. Sealed lead acid and NiMH do not mix.

- If the battery has been deep-discharged, a prolonged charging time is required to bring the battery back to full capacity.

Handling

- Do not incinerate or dismantle batteries. Cell components are corrosive and may be harmful to skin and eyes.

- Do not pull on battery lead wires or connector. Excessive force on the leads or connectors can damage the welding joints or other connections.

- Batteries are recyclable. Please dispose of properly.

> ⚠️ **WARNING:**
> Placing metal articles across the battery terminals can result in severe skin burns. It is good practice to remove all metallic items such as watches, bracelets and personal jewelry when working on or around the battery terminals. As a further precaution, when installing batteries or working on them, insulating gloves should be worn and only insulated tools should be used to prevent accidental short circuits.

Storage

- Always store batteries in a cool, dry place.

- After long storage, it is desirable to cycle (charge/discharge) the battery - 3 times to restore full capacity.

- Do not mix batteries with metal objects during storage or transportation to avoid accidental short-circuit.

- Do not store large quantities of batteries in a densely packed condition when they are in a charged or partially charged state.

10.0 Troubleshooting

Problem	Possible Cause	Solution
Light will not activate	No power to light	• Check battery terminals are properly connected. • Check battery voltage is above 3.4 volts.
	Ambient lighting conditions	• Ensure internal toggle switch is set to the 'ON' position. • Ensure light is in darkness. • Wait at least 60 seconds for the program to initialise in darkness.
Light will not operate for the entire night.	Insufficient Charging	• Expose light to direct sunlight and monitor operation for several days. Avlite products typically require 2.5-3.0 minimum hours of direct sunlight per day to retain full autonomy. From a discharged state, the light may require several days of operational conditions to 'cycle' up to full autonomy. • Ensure solar module is clean and not covered by shading during the day.
Lights are constantly on during the day.	Incorrect Operation Mode	• Check the Operational Mode setting in AvlitePro is not set to 'Always ON'

11.0 Warranty

Refer to Avlite website at www.Avlite.com.

12.0 Notes

Contact Us!

Avlite's solutions are easy-to-install and scalable. We have a solution for every budget.

Avlite Head Office

11 Industrial Drive, Somerville
Victoria, Australia 3912
T: +61 (0)3 5977 6128
F: +61 (0)3 5977 6124

Avlite Asia

8 Wilkie Road, #03-01
Wilkie Edge, Singapore 228095
T: +65 9119 8770

Avlite USA

61 Business Park Drive, Tilton
New Hampshire, USA 03276
T: +1 (603) 737 1311
F: +1 (603) 737 1320

@ info@avlite.com

🌐 www.avlite.com

🌐 www.star2m.com

"We Believe Technology Improves Navigation."