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AV-OL-KT-11

Obstruction Lighting Kit

ICAO - I-1

INSTALLATION & SERVICE MANUAL

V1.1



Version No.	Description	Date	Reviewed	Approved	Design
1.0	AV-OL-KT-11 Manual Launch	November 2019	P. Naidu	W. Evans	M. Sugars
1.1	Data updates	January 2020	P. Naidu	W. Evans	M. Sugars

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1.0 Introduction

Congratulations! By choosing to purchase an Avlite product, you have become the owner of one of the most advanced obstruction products in the world.

Avlite Systems draws on more than 25 years of experience in the design and manufacture of navigation aids, and particular care has been taken to ensure your product 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 lighting kit, and be able to maximise its operating function.

Please remember to complete the Avlite warranty registration card accompanying your product.

Acronyms and Abbreviations

The following abbreviations will be used throughout this Installation Manual:

cd	candela
ft.	foot
in.	inch
LED	Light Emitting Diode
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
AWG	American Wire Gauge
CMI	Combined Medium Intensity
LIOL	Low Intensity Obstruction Light
ILAB	ICAO Low Intensity Type A and B
LI	Low Intensity

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-KT-I1

The AV-OL-KT-I1 Obstruction Lighting Kit is a full turnkey solution for I-1 structures of up to 45m above ground level (AGL). These include telecommunication towers and utility towers, wind turbines, cranes, buildings and other tall structures.

The I-1 Obstruction Solution comes fully assembled, ready to install, and includes the following items:

- 1 x Low Intensity (LI) Dual Obstruction Light with integral Photocell
- Central Control Unit

The LI dual light fixture is a low intensity LED obstruction light designed to comply with ICAO LIOL Type A and Type B requirements. It is set to illuminate at night in the Steady-burning configuration for I-1. The LED optics offer an energy efficient and cost-effective lighting solution.

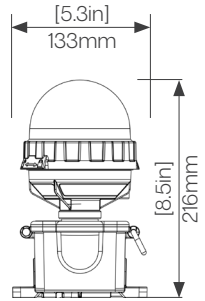
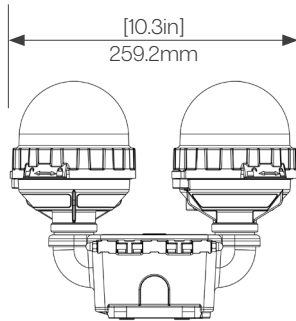
The I-1 Obstruction Light Solution is available in two input power configurations; a universal AC (90-264VAC) or DC (12-48VDC) (solar compatible) and comes with Star2M™ monitoring via GSM or SATCOM as options.

With a range of available brackets and cables, utility and telecommunication companies, electrical contractors and state and local governments can now quickly and easily purchase all obstruction lighting components from a single source, simplifying the ordering process and reducing the possibility of incompatible, stand-alone components from different manufacturers.

Note: This installation and service manual must be used in conjunction with the installation manuals of the individual lighting kit components.

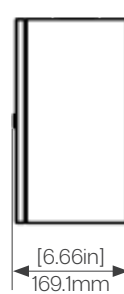
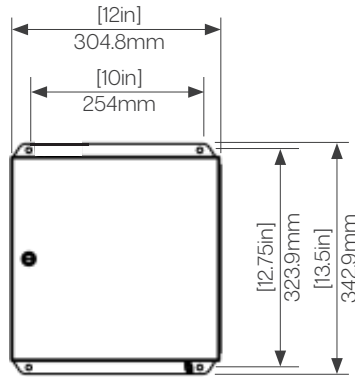
- AV-OL-LI-D Installation and Service Manual

1 x LI Dual Obstruction Light Dual AV-OL-LI-D



1 x Control Unit

Note: Mounting hardware not included.





3.1 Available Options

- Solar Input Power (for 12-48VDC) – Call Avlite for details.
- Cable Kit (for 45m height)
50m of 2.5mm², 3 conductor wire.
- Light Mounting Brackets
For LI Dual Obstruction light: Right Angle Mounting Bracket-Low Intensity Fixtures
Please Contact Avlite for details.
- Remote Monitoring and Control
Avlite offers remote Star2M™ monitoring via GSM or SATCOM.
Operators can remotely monitor the status of their installation from a compatible device. The system can also be configured to send out SMS text messages or e-mail alerts to designated operators should alarm conditions be triggered, such as low voltage or light failure.
Please contact Avlite for operational information for the Monitoring & Control options.
- Mounting Bolt Kit (includes bolts, nuts, washers)
Please contact Avlite for further details.

4.0 AV-OL-KT-I1 Data Sheet

ICAO I-1 Obstruction Kit	AC		DC	
Electrical Characteristics				
Input Voltage	90-264VAC		12-48VDC	
Input Frequency	50/60 Hz		N/A	
Power Consumption				
Peak	20VA		6W	
Average*	Night: 15VA		Night: 4.5W	
Physical Characteristics				
Dimensions	Height (inches/mm)	Width (inches/mm)	Lenth (inches/mm)	Mass (lbs./kg)
LI Dual	8.5 / 216	10.3 / 259.2	5.3 / 133	2.53/ 1.15
Control Unit	13.5 / 343	12 / 305	6.66 / 169	16 / 7.3
Mounting				
LI Dual	¾ inch pipe thread			
Control Unit	Wall mounted (mounting accessories available)			
Certifications and Compliance				
CE	EN61000-6-3:2007, EN61000-6-1:2007 FCC 47 CFR Part 15, subpart B			
Quality Assurance	ISO9001:2015			
Protection Rating	Junction and Control Box: IP65/NEMA4X		Lights: IP67	
ICAO	Low Intensity Obstruction Light Type A & B			
Intellectual Property				
Trademarks	AVLITE® is a registered trademark of Avlite Systems			
Warranty +	5 year warranty on light fixtures 3 year warranty on Control Unit			
Options Available	Mounting Brackets Solar Input Power (for 12-48VDC) Cable Kit (for 45m height) Remote Monitoring and Control Mounting Bolt Kit (includes bolts, nuts, washers)			

* Calculated using Dual LI Type B lights.

+ Please refer to the individual light installation manuals for further specifications



5.0 Safety Information

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

- Ensure the tower or mast is grounded (NO RF OR SHOCK HAZARD)
- Check the mast lighting circuit is not faulty
- 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 mounting pole is vertically aligned to guarantee the required beam pattern of the obstruction 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

6.1 System Overview

Avlite's I1 Obstruction Lighting Solution Kit consists of two components: A Control Unit which provides power and (optional) remote monitoring and a red, steady burning, Dual Obstruction Light fixture.

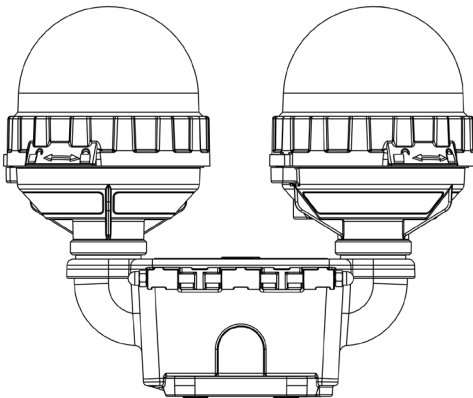
The LI Dual Light fixture is designed to comply with ICAO LIOL Type A & B requirements and operates as a concurrent fixture where both individual lights operate at the same time.

The I1 Obstruction Lighting Kit automatically switches between day and night mode via an integrated Photocell. When powered up, the LI Dual light fixture constantly checks day/night status using its internal Photocell which then averages the light measurement for 30 seconds.

The Dual light fixture incorporates internal diagnostic checking and an alarm contact for remote monitoring. The alarm relay is energized in normal operation and is released if there is an LED or power fault.

The Control Unit automatically evaluates the LI Dual light fixture for operation and performance while providing local and remote display of information and alarms; operators can conveniently view the lights' real time status from the web based Star2M™ portal.

6.2 AV-OL-KT-I1 Obstruction Lighting Kit

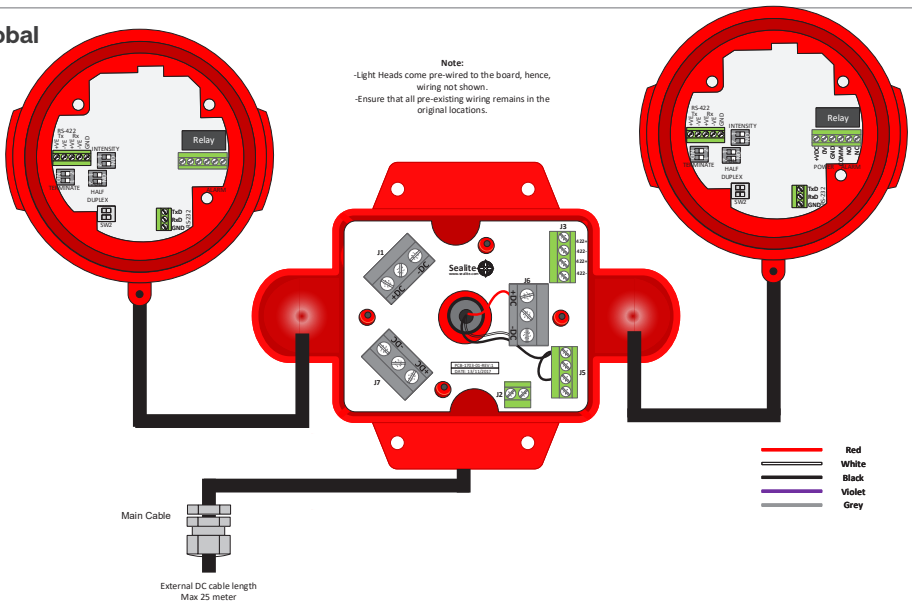


Power and Data

Positive (+VDC)	Red
Negative (-VDC)	Black
Alarm Signal NC	Green



Global



Light Intensity & Operation Mode Setting

The fixture will be supplied with the ICAO compliant optic. By default, the ICAO compliant model comes pre-set as an ICAO Type A fixture for a red, steady burning Low Intensity obstruction light in dusk-till- dawn mode.

If the customer should need to change the intensity or operation mode settings of the ICAO compliant model they can do this by changing the INTENSITY DIP switch. Please refer to the table below for DIP switch settings and the figure above for circuit board location.

Position 1	Position 2	Light Intensity
OFF	OFF	ICAO Low Intensity Obstruction Light Type A (10cd), dusk-till-dawn mode – DEFAULT
OFF	ON	ICAO Low Intensity Obstruction Light Type A (10cd), 24 hour mode
ON	OFF	ICAO Low Intensity Obstruction Light Type B (32cd), dusk-till-dawn mode
ON	ON	ICAO Low Intensity Obstruction Light Type B (32cd), 24 hour mode

For more information regarding the LI Dual Obstruction light Fixture, please consult the relevant sections of the corresponding service and installation manual.

6.3 T1 Controller

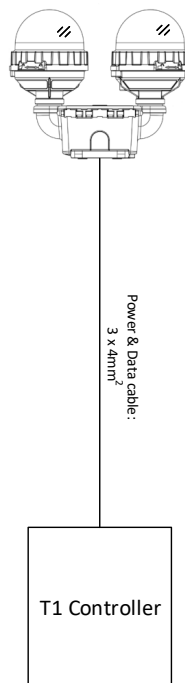
The T1 Control Unit is an essential component of the I1 Obstruction Lighting Kit as it provides power and monitoring of the Dual light fixture in the system.

For safety and security, the control enclosure comes with a safety interlock which prevents access to the controller while the system is powered on.

The Controller is available in two input power configurations; a universal AC (90-264 VAC) or DC (12-48 VDC) and comes with remote monitoring via Star2M with either GSM or Satcom telemetry types as options.

The Control unit comes with an alarm contact for remote monitoring of the Dual Light Fixture which receives the associated alarm in the event of a power or LED fault.

6.3.1 Interface Wiring





7.0 Unpacking, Installation, Wiring and Setup

7.1 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.

7.2 Installation



WARNING:

Confirm that the power switch is toggled to the OFF position when power is connected. **DO NOT** connect power to the PCU when the control panel power switch is toggled to the PWR position. This may result in damage to the power sources.



WARNING:

DO NOT connect directly to the DC output of a generator, or any other unregulated power source. Connecting to an unregulated source may result in damage.



WARNING:

Do not stare into light emitting diode (LED) beams.



CAUTION:

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.

7.2.1 Tools Required

Tools Needed (not supplied)
Flush Cutter
Tongue & Groove Pliers
Silicone Sealant
Cable Jacket Trimmer (optional)
Utility Knife
Electrical Tape
Insulated Terminal Crimper
Wire Strippers 10AWG to 18AWG Range
2.5mm Hex Key
2.0mm Flat Blade Precision Screwdriver
#2 Phillips Screwdriver
Junction Boxes (2) (owner supplied or optional purchase)
Light Mounting Brackets (4) (optional purchase)
Cables (owner supplied or optional purchase)

7.2.2 Location

Refer to ICAO Annex 14 Aerodromes Design and Operations Sixth Edition for site requirements for obstruction lights.



7.2.3 Cabling Requirements

The installation of the AV-OL-KT-I1 Obstruction Lighting Kit requires the following cables (if optional cable kit is not purchased):

Reference Point	Cable
Dual Obstruction Light-Control Unit	• Power & Data Cable: 2.5mm ² , 3 Conductor

7.2.4 Factory Configuration

Dual light fixture with both light heads preassembled.

7.2.5 Installation Recommendation

Note: The sequence of steps can be adjusted for site requirements.

1. Wire and test the system on ground level.

Conduct a basic functional check to ensure that the lights turn on as expected. Refer to Section 7.3 *Testing Procedure*.

2. Mount the Control Unit

The Control Unit should be mounted in a reasonable location at eye level to ensure that it is easily accessible for servicing and maintenance. There should be plenty of clearance around all sides to allow direct access when the door of the control unit is completely open.

- a. Attach the required mounting hardware to the top and bottom of the Control Unit.



Example of Control Unit mounting hardware

Pre-installed Control Unit tab

- b. Mount the Control Unit (with the previously attached mounting hardware) to the tower or installation structure using the mounting tabs. Secure using the required mounting fixtures.



Note: Mounting hardware is not included with the kit.

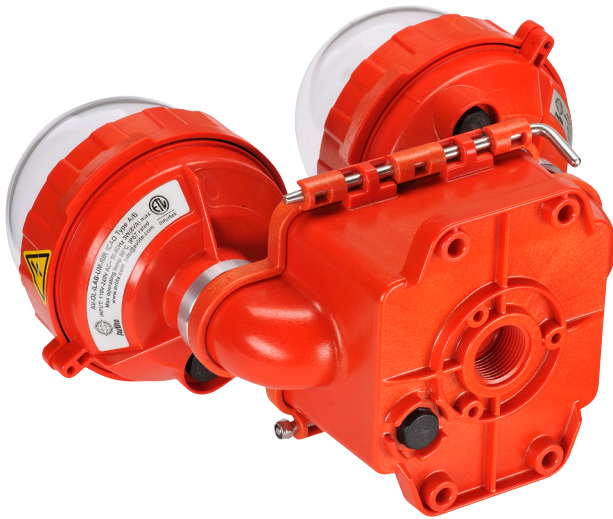


3. Install the LI Dual Light Fixture

Mount the Dual Light Fixture onto the rigid conduit using the 3/4" NPT thread.

- a. Mount dual assembly to 3/4" NPT thread fitting or use optional mounting hardware.
- b. Open enclosure by removing the locking pin.
- c. Connect wires for interfacing cable into provided junction points as shown in section 6.2 AV-OL-KT-11 *Obstruction Lighting Kit*

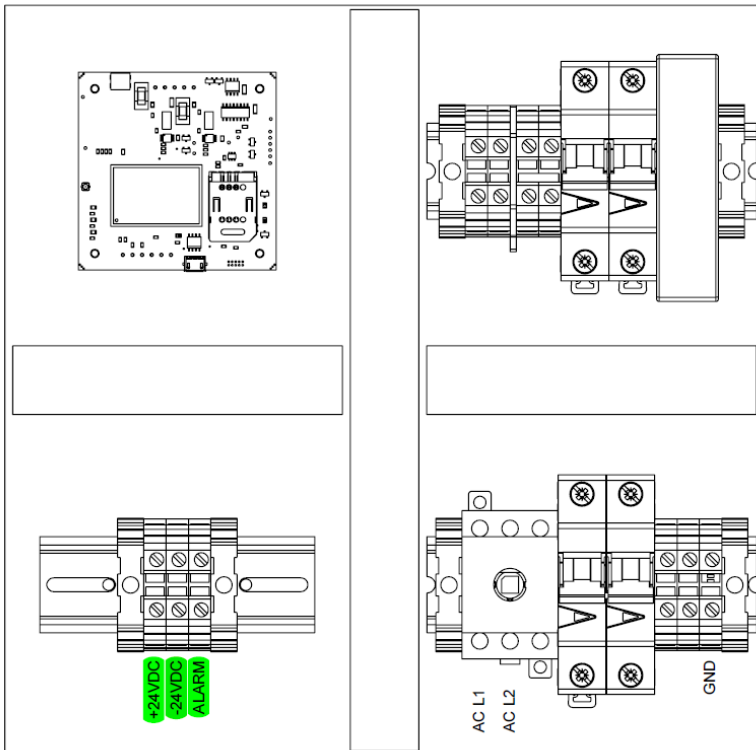
Note: Dual light head is preassembled.



4. Route LI Dual light fixture to Control Unit cables

Wiring Instructions - Power and Data Cable:

- Connect the red positive conductor from the dual light fixture to the +24VDC terminal block in the Control Unit
- Connect the black negative conductor from the dual light fixture to the -24VDC terminal block in the Control Unit
- Connect the green alarm conductor from the dual light fixture to the Alarm terminal block in the Control Unit



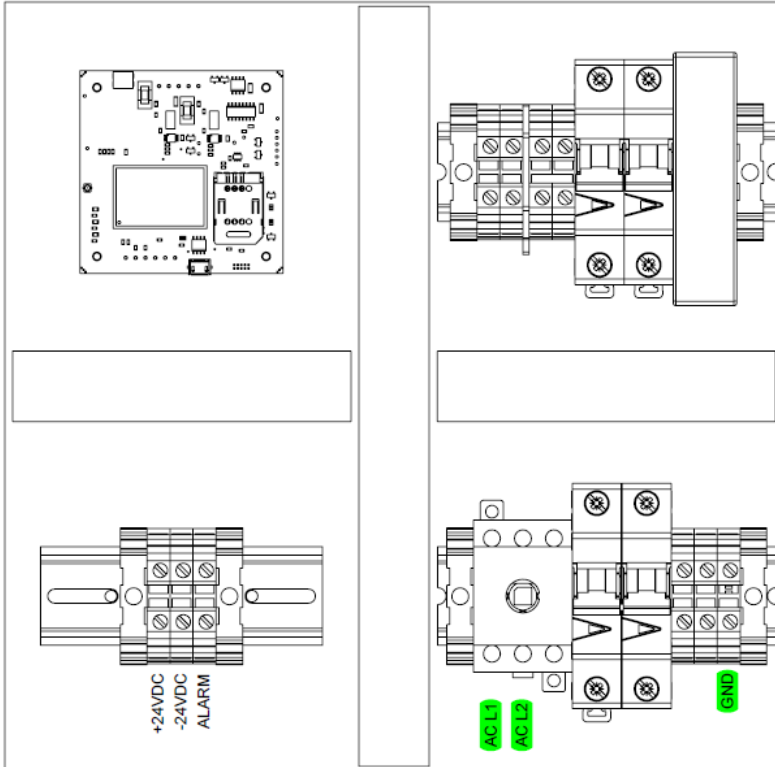


5. Wiring the Control Unit:

AC Installation:

Avlite has supplied a cord grip for installation of the power cord in the bottom of the Control Box. Connect the incoming power conductors to the appropriate terminals (L1 and L2) on the power switch in the Control Box.

The grounding conductor will be connected to the green/yellow GND terminal block adjacent to the power switch.



DC Installation:

Connect the positive conductor to terminal 1 on terminal block 1.

Connect the negative conductor to terminal 3 on terminal block 1.

7.3 Testing Procedure

Note: Avlite recommends that all testing be done during the day.

1. Power the system on.
2. Check that no circuit breakers have tripped.
3. Cover each light fixture in the LI Dual obstruction light and ensure they turn on.
4. Uncover each light fixture in the LI Dual obstruction light and ensure they turn off.
5. For O1 & O2 Variants only:
 Trip the breaker for the LI Dual light fixture and ensure that the corresponding alarm is received (if monitoring is installed)

8.0 Maintenance and Servicing

Refer to the individual light manuals for light maintenance.

Ensure Photocell is free from debris (i.e. snow, leaves, etc.) for reliable and continuous operation.

9.0 Replacement Parts

If replacement parts are required, please call a local Avlite distributor and reference the Product or Configuration Code called out in the "Product Configuration and Options" section of the corresponding product data sheet.



10.0 Troubleshooting

Problem	Possible Cause	Solution
LI Dual Obstruction Light will not activate	Wiring of Light to Power supply	<ul style="list-style-type: none">• Check the wiring of the light and ensure proper connectivity with power supply.• If wiring functions properly, use an alternate power source to check the light.• Replace light if necessary.
	Incorrect Power supply specifications	<ul style="list-style-type: none">• Ensure that the Power supply has the right polarity and voltage range.
	Malfunctioning internal Photocell	<ul style="list-style-type: none">• Cover the photocell and ensure that the light turns ON.
	Cable to Control Unit	<ul style="list-style-type: none">• Check Control Unit to LI Dual Obstruction light cable connections at both ends.• Inspect cable for breaks.

Notes

Avlite Solution Verticals available



Airfield



Heliport



Obstruction



We believe technology improves navigation™

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