Obstruction Lighting
GSM Cell-Phone Monitoring & Alarm System
Owner’s Manual
Version 1.0
**Disclaimer:**
It is the customer’s responsibility to check with their service provider (prior to installation) to ensure there is network coverage in the area in which the light(s) will be installed. Avlite Pty Ltd will not be held responsible if the network coverage of the service provider should fail.
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<th>Description</th>
<th>Date</th>
<th>Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Manual Launch</td>
<td>July 2006</td>
<td>S. Turner</td>
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</tbody>
</table>
**Introduction**

Welcome to GSM monitoring of your Avlite light. The Avlite GSM Monitoring and Alarm System is a complete integrated module designed to allow convenient monitoring of Avlite lights using a cellular telephone and web access from remote locations that have GSM network coverage.

The GSM circuit monitors the data from the light and will report to designated cell phones a number of pre-programmed alarm conditions if they occur.

The GSM System is internally housed within the Avlite light and requires no external aerials – providing convenient installation and retaining the IP68 waterproof rating of the light.

The user can also send an SMS text message to the designated Avlite light to receive a status report from the light by return SMS text message. In addition, the user has complete control over the types of alarms received should a fault occur, as well as an array of remote control options including operational mode and flash code.

The user can also set the light up to regularly report to a secure area of the Avlite website (the Avlite web gateway). This will provide details of your light's operation and its GPS position and includes historical graphed statistics of each light.

All functions can be programmed into the remote light by sending an appropriate SMS text message from a designated cell phone.

Alerting to a potential power disruption has never been easier.

The Avlite GSM Monitoring and Alarm System is secure – unauthorised access to the light’s data cannot occur as only the designated cell phone numbers programmed into the light will respond to a remote SMS text message.

Data transferred to, and maintained, on the Avlite website is user password protected.

In order to optimise power consumption, the GSM module wakes up every 3 hours to check for messages and process commands. Alarm conditions will however cause the GSM to wake up immediately and send a message. The GSM module will remain awake for approximately 10 minutes after processing the last message.

**Key Features:**

- Access of current light status at any time by sending an SMS text message to the light from any designated cell phone number. The light status is sent by return SMS text message;
- Regular reporting of light status to designated cell phone numbers and/or web server;
- Reports any pre-programmed alarm condition to designated cell phone numbers, and/or email addresses;
- Remote control of light features by sending an SMS text message to the light including flash setting and operation mode;
- Versatile configuration allows light with or without GPS modules fitted to be monitored remotely.

**Available Data from Remote Light:**

- Battery voltage
- Solar module charging current
- Light current draw
- Light position - Latitude and Longitude (with GPS option)
- Day/night on status
- Current operation mode
- Current flash code setting
- Current intensity setting
All components of the GSM Receiver / Transmitter are enclosed within the Avlite light body.
Setup of the Avlite GSM Monitoring and Alarm System is a simple 4-step process, outlined below;

**STEP 1:**
Purchase, Record and Insert SIM Card into GSM Light

- Similar to a cell-phone, a valid SIM card needs to be acquired and inserted into the GSM module prior to use (see “Purchasing a SIM Card” section of this manual). Refer to *Installing the Sim Card* section of this manual for a step-by-step guide to installing your SIM card.

**STEP 2:**
Program Cell Phone Access List, Web Reporting and Essential Commands

- The access list is a list of cell phone numbers from which the Avlite GSM Monitoring and Alarm System will accept configuration commands and report requests. Web reporting and essential commands may also be setup at this step.

**STEP 3:**
Program Desired Cell Phone Reporting List and Alarms

- The report list is the list of cell phone numbers which the light may send any SMS text message alarm report to. Alarm emails may also be activated from Avlite’s secure GSM Web Portal.

**STEP 4:**
Accessing the Avlite GSM Web Portal

- By sending a report to the Web gateway and providing access via the Avlite website, historical data and graphs may be viewed on each light.

---

**NOTE:** The Avlite GSM will remain awake for 10 minutes after power on or from the last message sent, but then will enter a 3 hour sleep cycle during which time it will not process commands.
Purchasing a SIM Card and Recording Details

Ensure the SIM card is unlocked prior to installing into the light.

One SIM card is required per light and can be purchased from your local telecommunications dealer. You may decide to purchase a pre-paid SIM card, or set the SIM card up on a plan (this is similar to purchasing a new cell phone).

Avlite’s GSM enabled lights require a Mini-SIM or 2FF SIM Card with a 6 pin contact arrangement.

**RIGHT:**
- Mini-SIM or 2FF SIM Card (2nd Form Factor)
- 6 pin contact arrangement

**WRONG:**
- 8 pin contact arrangement

Each light with GSM Monitoring and Alarm System will have an individual cell phone number. This number is unique to the light and should be recorded for reference purposes against the light it is installed in. To assist in recognition it is advisable that a description be included as well as the number (For example, Port Beacon #12, +61400123456). A similar recording in user cell phones will assist in identifying light installations to which SMS text message commands are sent (the same process as adding a new contact in your cell phone address book).
Installing the Sim Card

Remove the 6 retaining screws from the cover on the underside of the light, to gain access to the GSM compartment.

Open the SIM Card holder and insert the SIM into the holder.
- Make sure the SIM Card is positioned correctly.
- Make sure the SIM Card is ‘Unlocked’ before inserting in the holder (ie. the SIM card password has been disabled).

Fold the SIM Card holder and push it back into the closed position.

Replace the 6 retaining screws to close the GSM compartment.
- Make sure the rubber seal is positioned correctly before fitting the cover.
STEP 2: Program Cell Phone Access List, Web Reporting & Essential Commands

The Access List is a list of cell phone numbers from which the Avlite GSM Monitoring and Alarm System will accept configuration commands and report requests. Web reporting and essential commands may also be setup at this step.

Follow the process below to program the Access List, Web Reporting and Essential Commands;

- The light will accept the first cell phone contact for instructions.
- The first instruction must be correct as the light will then only respond to the access cell phone number(s) given.

Two numbers should be provided to the light to ensure there is a backup access**.

- “+” and the country code (eg. 61 for Australia, or 44 for U.K) are required to establish the country prefix in which the GSM unit is to operate in. Additional cell phone numbers can then be added by sending commands from those numbers given access.
- For example, to add an Australian cell phone number to the access list the SMS text message command would be: add access +61400987654

All additional telephone numbers added to the access list must continue to be in international format.

- Once the number has been added to the access list the Avlite GSM Monitoring and Alarm System will accept commands from these numbers and acknowledge confirmation via reply SMS text message.

- This command initiates the daily web reporting, which sends a daily diagnostic update to be viewed from your secure login at the Avlite Website.

Select a cell phone from which the GSM Monitoring and Alarm System module will be activated.

Add cell phone numbers to the permitted access list by sending the SMS text message:-

add access +(country code)(phone number)

More than 1 cell phone number can be included in the SMS text message. To do this separate each cell phone number with a ‘comma’ character.

Enable web reporting by sending the SMS text message:-

add autoreport

Only phone numbers listed in the Access List will be able to “Set” and “Get” light information.

**In the event that the access cell phone number(s) is lost or no longer in service, Avlite can reset the light from the factory if required.
From an authorized Access Cell Phone send a new SMS with text message ‘status’ or ‘report’ to the designated SIM card number of your GSM light.

Within a few minutes expect a reply in similar format as the following:

------------------------------------------
Status Report
Volts:  14.1V
Charge: 0.33A
Mode: Dusk to Dawn
FCode: 051
Night
Lat:  38 13.2988 S (Latitude 38° 13.2988’)
Long: 145 10.8529 E (Longitude 145° 10.8529’)
------------------------------------------

Note: The actual layout of the message is dependent on your cell phone screen.
Note: Lat/long only shown when GPS option is fitted

User Case #1: Setting up the light to report an alarm to a cell phone

In this example, a cell phone with the phone number +61491570166 is used to enable the alarm function low battery. When the alarm condition occurs, the light will alert cell phone +61491570156.

Note: it is allowable to assign a different cell phone number to receive the alarm reports.

The following messages will be texted to the light:
add access +61491570166
add report +61491570156
add alarm batlo

<table>
<thead>
<tr>
<th>SMS text message to Light</th>
<th>SMS text message received on cell phone</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td>Configures the light to allow commands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: The cell number must be formatted as: +(country code)(phone number)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td>When an alarm condition occurs, a text message will be sent to phone number. Note it is allowable to assign a different cell phone number to receive the alarm reports.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td></td>
<td>The light will send a text message to all phone numbers in the report list when the battery voltage falls below 10V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
User Case #2: Setting up the light to report to the Avlite web gateway

In this example, a cell phone with the phone number +61491570166 will configure the light to send daily reports to the Avlite web gateway.

The following messages will be texted to the light:
- add access +61491570166
- add web +61416906478
- add autoreport web

<table>
<thead>
<tr>
<th>Step 1</th>
<th>SMS text message to Light</th>
<th>SMS text message received on cell phone</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>add access +61491570166</td>
<td>Access List +61491570166</td>
<td>Configures the light to allow commands</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Note: The cell number must be formatted as: + (country code)(phone number)</td>
</tr>
</tbody>
</table>

| Step 2 | add web +61416906478     | Web List +61416906478                 | When an alarm condition occurs, a text message will be sent to the Avlite web gateway. This is the phone number for Avlite’s web gateway. |

| Step 3 | add autoreport web        | Alarm Added Web Report                | Enables a daily web report to be sent to the Avlite web gateway number |

Notes:
1. In order to view web reports, please refer to “Accessing the Avlite Web Reports” section of this manual.
2. If the light is located outside of Australia, the light’s SIM card will need permission to be send text internationally. Please consult with your SIM card provider to ensure that this feature is enabled.
An alarm is an SMS text message which is sent after a preset alarm condition programmed into the light is triggered. Care should be taken when selecting suitable alarms as they can generate large numbers of SMS text messages if not carefully selected.

The report list establishes the cell phone numbers that the alarms will be sent to.

**Programming Report List**

The following process will create a list of approved cell phone numbers from which desired alarm reports will be sent:

- This creates an authorised list of cell phone numbers belonging to staff, on-call company maintenance officers or contractors.
- For example, to add an Australian cell phone number to the report list the SMS text message command would be:
  
  **add report +61400987654**

- The SMS text message ‘report’ sent from on-call company maintenance officers or contractors in this list will now generate the standard report SMS text message reply from the light.

**Use a cell phone in the access list to create the report list by sending the SMS text message:**

```
add report +(country code)(phone number)
```

More than 1 cell phone number can be included in the SMS text message. To do this separate each cell phone number with a ‘comma’ character.

**A successful update will result in an SMS text message reply:**

```
Report List
+(designated cell phone numbers)
```

The designated cell phone number has now been added to the ‘report’ list. The Avlite GMS module will now accept an SMS text message request for status ‘report’ from this number.

A typical response SMS text message report message from a light will display as below:

```
------------------------------------------
Report List
+61400111222
------------------------------------------
```

*Note: The actual layout of the message is dependent on your cell phone screen.*
Creating Individual Alarms to be sent to the Cell Phone Report List

Specific alarms can be created and sent as an SMS text message to cell phones listed in the Report List.

The following process will enable desired alarms;

- An example of an actual alarm SMS text message would be:
  
  add alarm batlo

- This sets the low battery alarm. No cell phone number is required following the SMS text message

A successful update will result in an SMS text message reply:-

   Alarm Added
   (list of all alarms currently setup)

A typical response SMS text message report message from a light when alarms are set up will display as below:

------------------------------------------
Alarm Added
Low Battery
Web Report
------------------------------------------

Note: The actual layout of the message is dependent on your cell phone screen.

Once an alarm condition has occurred/been triggered an SMS text message will be sent reporting the alarm to all cell phone numbers listed in the “Report List” and/or to the email addresses listed in the enabled “Alarm Emailing List” from the Avlite GSM Web Portal. Alarm conditions will continue to be reported once every 24 hours. This is to prevent constant reporting of the same alarm or multiple alarms. The light can still be accessed by requesting a report via SMS text message.
**Alarm Sources Summary**

All of the following alarm conditions can be programmed via SMS text message to be either ENABLED or DISABLED.

If an alarm condition that has been enabled occurs, an SMS text message will be automatically sent to all the cell phone numbers listed in the Report List.

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Enable Command Format</th>
<th>Disable Command Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>add alarm</td>
<td>batlo</td>
<td>Alarm SMS “batlo” is asserted when the battery voltage falls to a low level (flat battery). An alarm condition will be set if the system battery voltage falls below 10.0v indicating a flat battery. The light will be turned OFF if the battery voltage falls below 10.0v.</td>
<td>add alarm batlo</td>
<td>delete alarm batlo</td>
</tr>
<tr>
<td>add alarm</td>
<td>nodata</td>
<td>Alarm SMS “nodata” is asserted when the GSM module loses communication with the light circuitry.</td>
<td>add alarm nodata</td>
<td>delete alarm nodata</td>
</tr>
<tr>
<td>add alarm</td>
<td>LED</td>
<td>Alarm SMS “LED fail” is asserted when circuit detects an LED fault. This may mean the LED is not lit</td>
<td>add alarm LED</td>
<td>delete alarm LED</td>
</tr>
</tbody>
</table>

**Daily Reporting Alarms**

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Enable Command Format</th>
<th>Disable Command Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>add alarm</td>
<td>daily</td>
<td>Enables a daily status report from the light to be sent to all cell phone numbers in the report list. This report occurs 4 hours after daybreak each day.</td>
<td>add alarm daily</td>
<td>delete alarm daily</td>
</tr>
<tr>
<td>add alarm</td>
<td>power</td>
<td>Enables a daily battery status report to be sent to all cell phone numbers in the report list. This report occurs 4 hours after daybreak each day.</td>
<td>add alarm power</td>
<td>delete alarm power</td>
</tr>
<tr>
<td>add alarm</td>
<td>web</td>
<td>Enables a daily web report to be sent to Avlite’s GSM Web Portal, web gateway numbers in the web list. This report occurs 4 hours after daybreak each day.</td>
<td>add alarm web</td>
<td>delete alarm web</td>
</tr>
</tbody>
</table>

**ALARMS AVAILABLE FOR GPS ENABLED LIGHTS ONLY**

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Enable Command Format</th>
<th>Disable Command Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>add alarm</td>
<td>nogps</td>
<td>Alarm SMS “nogps” is asserted when the GPS data is not available - usually due to GPS signal loss.</td>
<td>add alarm nogps</td>
<td>delete alarm nogps</td>
</tr>
</tbody>
</table>
A) Via Cell Phone

General data about the light is accessed via simply sending the SMS text message; ‘status’ or ‘report’ from an authorized cell phone number (must be listed in the ‘access’ list or ‘report list’) to the designated light’s SIM card number.

An automatically generated reply SMS text message will then be sent to your cell phone which includes information about the light status.

1. A typical requested SMS text message report from a light will display as below; ‘status’ or ‘report’

------------------------------------------
<table>
<thead>
<tr>
<th>Status Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volts: 14.1V</td>
</tr>
<tr>
<td>Charge: 0.33A</td>
</tr>
<tr>
<td>Mode: Dusk to Dawn</td>
</tr>
<tr>
<td>FCode: 051</td>
</tr>
<tr>
<td>Night</td>
</tr>
<tr>
<td>Lat: 38 13.2988 S (Latitude 38° 13.2988’)</td>
</tr>
<tr>
<td>Long: 145 10.8529 E (Longitude145° 10.8529’)</td>
</tr>
</tbody>
</table>

Note: The actual layout of the message is dependent on your cell phone screen.
If the light is not fitted with GPS the message “No GPS Data” will be given in place of the GPS data.

2. Specific battery data from your light is accessed via the SMS text message; ‘power’ or ‘battery’

------------------------------------------
<table>
<thead>
<tr>
<th>Power Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery: 14.2V</td>
</tr>
<tr>
<td>Charge: 0.24A</td>
</tr>
<tr>
<td>Load: 0.02A</td>
</tr>
<tr>
<td>Yesterday</td>
</tr>
<tr>
<td>Min: 14.1V</td>
</tr>
<tr>
<td>Max: 14.3V</td>
</tr>
<tr>
<td>Max Solar: 0.36A</td>
</tr>
<tr>
<td>Charge: 1.76Ah</td>
</tr>
<tr>
<td>Load: 0.56Ah</td>
</tr>
</tbody>
</table>

Note: The actual layout of the message is dependent on your cell phone screen.
Ah = Ampere Hours = current x time (24 hour running).
Yesterday’s power data is only available if the GSM has been running for more than 24 hours.
B) Via Avlite GSM Web Portal

To configure your GSM light to send daily reports or alarms to Avlite’s secure online GSM Web Portal the following messages MUST be sent via SMS text message to your light:

“add web +61416906478”

Then send the SMS text message:

“add autoreport web”
The add Command

The “add” command allows;
- Cell phone numbers to be added to the ‘access’ and ‘report’ lists and;
- Required alarms and autoreports to be enabled.

Only users listed in the Access List are able to use the “add” commands

Full cell phone numbers including ‘+’ and country code must be used when adding cell phone numbers to the ‘access’, ‘report’ & ‘web’ lists.

To add the cell phone number 0402123456 to the ‘report’ list the following command would be sent in an SMS text message from any cell phone number listed in the access list:

“add report +61402123456”

A successful update would result in an SMS text message reply:

“Report List
+61402123456”

To add a low battery alarm trigger the following command would be sent in an SMS text message from an authorised cell phone:

“add alarm batlo”

A successful update would result in an SMS text message reply:

“Alarm Added
Low Battery
No Lantern Data
No GPS Data”
## Command Parameter | Function | Example Command Format |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>access</strong></td>
<td>Adds additional cell phone number(s) to the permitted access list. More than one cell phone number can be included in the SMS by separating each number with a “comma” character. The same cell phone number may also be programmed into the “report” list. The access list can contain a maximum of 16 cell phone numbers.</td>
<td>add access +61402123456 or/ add access +61402123456, +61402654321</td>
</tr>
<tr>
<td><strong>report</strong></td>
<td>Adds additional cell phone number(s) to the permitted report list. More than one cell phone number can be included in the SMS by separating each number with a “comma” character. The same cell phone number may also be programmed into the “access” list. The report list can contain a maximum of 16 cell phone numbers.</td>
<td>add report +61402123456 or/ add report +61402123456, +61402654321</td>
</tr>
<tr>
<td><strong>alarm / autoreport</strong></td>
<td>Adds the required alarm or autoreport functions that will report to the cell phones in the report list. More than one alarm can be included in the SMS. Separate each alarm condition with a “space” character. Possible alarms are: batlo, nodata, daily, nogps, web, power, LED Possible autoreports are: status, daily, battery, power, web</td>
<td>add alarm batlo or/ add alarm batlo, nogps or/ add autoreport status</td>
</tr>
</tbody>
</table>

All cell phone numbers must be presented in international format – ie/ In Australia ‘0402123456’ becomes ‘+61402123456’. In the United Kingdom, ‘07791234567’ becomes ‘+447791234567’. The maximum phone number can be 15 digits long, if you require more than 15 digits please contact Avlite.
The "list" command allows the operator to view:

- Cell phone numbers listed in the 'access', 'report' and 'web' lists and;
- List enabled alarms and autoreports programmed into the light.

Only users listed in the Access List are able to use the “list” commands

To determine the cell phone number entries in the 'report' list the following SMS text message command would be sent:
“list report”

The GSM Monitoring and Alarm System would SMS text message a response containing the contents of this list:
“Report List:
+61402123456,
+61402654321”

To determine the 'alarm' list the following SMS text message command would be sent:
“list alarm”

The GSM Monitoring and Alarm System would SMS text message a response containing the contents of this list:
“Current alarm list: nodata, temphi, nogps, nopps, batlo”

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Example Command Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>list</td>
<td>access</td>
<td>Requests a list of the current cell phone numbers in the access list. An SMS is returned showing the current access list.</td>
<td>list access</td>
</tr>
<tr>
<td></td>
<td>report</td>
<td>Requests a list of the current cell phone numbers in the report list. An SMS is returned showing the current report list.</td>
<td>list report</td>
</tr>
<tr>
<td></td>
<td>web</td>
<td>Requests a list of the current Avlite web gateway phone number. An SMS is returned showing the current report list.</td>
<td>list web</td>
</tr>
<tr>
<td></td>
<td>alarm / autoreport</td>
<td>Requests a list of the current alarms and autoreports programmed into the alarm list. An SMS is returned showing the current alarm list.</td>
<td>list alarm or list autoreport</td>
</tr>
</tbody>
</table>

All telephone numbers must be presented in international format – ie/ In Australia ‘0402123456’ becomes ‘+61402123456’. In the United Kingdom, ‘07791234567’ becomes ‘+447791234567’.
The delete Command

The “delete” command operates in the same way as the “add” command. The difference is the “delete” command will also accept the keyword “all”. This allows the list to be cleared in a single SMS text message.

Only users listed in the Access List are able to use the “delete” commands

To remove the cell phone number 0402123456 from the report list the following command would be sent:
“delete report +61402123456”

A successful deletion would result in an SMS text message reply:
“Report List
Empty”

When the report list is “empty”, this means that there are no cell phone numbers in the ‘report’ list, therefore disabling the automatic alarm function.

To remove an alarm from the alarm list the following command would be sent:
“delete alarm batlo”

A successful deletion would result in an SMS text message reply:
“Alarm Deleted
No Lantern Data
No GPS Data”

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Example Command</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>delete</td>
<td>access</td>
<td>Deletes the requested cell phone number from the permitted access list.</td>
<td>delete access</td>
<td>+61402123456</td>
</tr>
<tr>
<td></td>
<td>report</td>
<td>Deletes the requested cell phone number from the permitted report list.</td>
<td>delete report</td>
<td>+61402123456</td>
</tr>
<tr>
<td></td>
<td>web</td>
<td>Deletes the requested cell phone number from the permitted web list.</td>
<td>delete web</td>
<td>+61416906478</td>
</tr>
<tr>
<td></td>
<td>alarm / autoreport</td>
<td>Deletes the requested alarm or autoreport from the current alarm list.</td>
<td>delete alarm batlo</td>
<td></td>
</tr>
</tbody>
</table>

All telephone numbers must be presented in international format – ie/ In Australia ‘0402123456’ becomes ‘+61402123456’. In the United Kingdom, ‘07791234567’ becomes ‘+447791234567’.
The “get” command is used to retrieve or “get” information from the light. Information that can be retrieved includes:

- Light Type
- Software Version
- Flash Code
- Intensity
- Operation Mode

Only users listed in the Access List are able to use the “get” commands

To retrieve the current flash code setting in the light, the following command would be sent:

“Get fc” or “Get Flashcode” or “Get Flash code”

A successful reply would result in an SMS text message reply:

**Lantern Config**
- **Mode:** Dusk to Dawn
- **Flash Code:** 000
- **Intensity:** ICAO Type A

*Note: The 51 indicates the flash code as it relates to the sequence found in the Avlite Flash Code Tables*

To retrieve the current intensity setting in the light, the following command would be sent:

“Get intensity”

A successful reply would result in an SMS text message reply:

**Lantern Config**
- **Mode:** Dusk to Dawn
- **Flash Code:** 000
- **Intensity:** ICAO Type A

**Valid intensity settings:**
- ICAO Type A (10cd)
- ICAO Type B (32cd)
- FAA L810 (32.5cd)

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Example Command Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>get</td>
<td>Type</td>
<td>Gets the light hardware type</td>
<td>Get type</td>
</tr>
<tr>
<td></td>
<td>Version</td>
<td>Gets the light’s software version</td>
<td>Get version</td>
</tr>
<tr>
<td></td>
<td>Operation Mode</td>
<td>Gets the light’s operational mode</td>
<td>Get Mode Get Op</td>
</tr>
<tr>
<td></td>
<td>Fc Flashcode</td>
<td>Gets the light’s flash code</td>
<td>Get fc Get flashcode Get flash code</td>
</tr>
<tr>
<td></td>
<td>Flash code</td>
<td>Note: the light will respond to any of the options shown to the left.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intensity</td>
<td>Gets the Light’s current intensity setting</td>
<td>Get intensity</td>
</tr>
</tbody>
</table>

All telephone numbers must be presented in international format – ie/ In Australia ‘0402123456’ becomes ‘+61402123456’. In the United Kingdom, ‘07791234567’ becomes ‘+447791234567’.
GSM Cell-Phone Monitoring & Alarm System

The set Command

The “set” command is used to enter or “set” information on the light.
Information that can be set by the user includes

- Operation Mode
- Flash Code

Only users listed in the Access List are able to use the “set” commands

To set a new flash code, the following command would be sent

“All fc 83” or “Set Flashcode 83” or “Set Flash Code 83” (the flash code used was 8,3 (0.3On, 0.7Off)

A successful reply would result in an SMS text message reply:

Lantern Config
Mode: Dusk to Dawn
Flash Code: 083
Intensity: ICAO Type A

Note: The 0x indicates the number is in Hexadecimal Format
Note: The 51 indicates the flash code as it relates to the sequence found in the Avlite Flash Code Tables

The default values for the light are:
- Operation Mode – Dusk to Dawn.
- Flash Code – is factory set to 00 via the Rotary Switches.
- Intensity – is factory set to 100% via the DIP Switches.

<table>
<thead>
<tr>
<th>Command</th>
<th>Parameter</th>
<th>Function</th>
<th>Example Command Format</th>
</tr>
</thead>
</table>
| set     | Mode      | Sets the light’s operation mode.  
|         |           | • Dusk to Dawn, on  
|         |           | • Standby, off        | Set mode Dusk to Dawn  
|         |           | Set mode Standby      | Set fc 51  
|         | Fc Flashcode Flash code | Sets the light’s flash code  
|         |           | Note: the light will respond to any of the options shown to the left. The flash code set by this command will remain active until either a new command is received or the Rotary Switches are changed. | Set flashcode 51  
|         |           | Set flash code 51     |

All telephone numbers must be presented in international format – ie/ In Australia ‘0402123456’ becomes ‘+61402123456’. In the United Kingdom, ‘07791234567’ becomes ‘+447791234567’.
CREATE A GSM ACCOUNT

After daily web reporting has been enabled via SMS text message command and your GSM light, access to historical data and graphs about individual light installations is available via the Avlite website.

Follow the steps below to access your light operational data;

1. Go to www.Avlite.com on the internet, select the Technical tab, then select CREATE GSM ACCOUNT.

For light data to be updated daily in the Avlite GSM Web Reports, users must first send the SMS text message command “add alarm web” to the designated light(s).
2. Complete the details on the **GSM System Account Creation** screen including your contact details and valid Avlite GSM Product Serial Number, and click **Submit**.

3. Check your email account for confirmed secure login details.
LOG INTO YOUR GSM ACCOUNT

4. Go to www.Avlite.com on the internet, select the Technical tab, then select AVLITE GSM PORTAL.
5. Complete your login details
Once logged in, you will come to the **GSM Dashboard** page.

This page has menus you can use to navigate your way around Avlite’s GSM Web Portal where you can perform a variety of tasks such as adding or removing GSM lights, viewing your light installations on a map, view critical light data or request help.

You can easily return to this page at any time by selecting **Dashboard** in the menu on the left of the page.
**CONFIGURATION**

The **Configuration** menu of the **GSM Dashboard** enables you to do the following:

- See critical light data in summary table view
- Drill down on each light to view all data
- Add or remove GSM lights
- Enable & configure alarm email messaging
- Enable & configure daily email reports
Add GSM Lights

To register your light with Avlite’s secure online web reporting system you need to add it to your account:

1. Select **Configuration Table** from the **GSM Dashboard** or select **Configuration Table** in the menu on the left of the page.

2. Click on **ADD+**
   This can be found at the bottom right of the table.

For light data to be updated daily in the Avlite GSM Web Reports, users must first send the SMS text message command “add alarm web” to the designated light(s).
3. The following page will appear on your screen.

4. Fill in the details of your light:
   
   **Identify:** Enter the light’s individual cell-phone number and identifying name. It is suggested that the name of the light be descriptive for easy identification.
Configure: ENABLE ALARM EMAILS
Check this box if you wish to receive an email if this light triggers an alarm.
Enter the email addresses of the personnel that you wish to receive alarm messages.
You can enter the email addresses of up to 2 additional recipients.
If an alarm is triggered an email will be sent to these addresses.

When ENABLE ALARM EMAILS is selected, the following message will appear.
Please see ??? for instructions to add Avlite’s gateway phone number to the internal “alarms” list of your GSM product.

For light alarm data to be sent to the Avlite GSM Web Portal when triggered, users must first send the SMS text message command to the light to set up the particular alarm required.
Configure: ENABLE REPORT EMAILS

Check this box if you wish to receive an email report from this light daily.
Enter the email addresses of the personnel that you wish to receive daily reports.
You can enter the email addresses of up to 2 additional recipients.

2. Configure

Enabling alarms will cause you to receive an email if this unit triggers an alarm.
Alarms can be sent to up to 3 email addresses.
ENABLE ALARM EMAILS

Enabling reports will cause you to receive an email report from this unit daily.
Reports can be sent to up to 3 email addresses.
ENABLE REPORT EMAILS

☑
REPORT EMAIL 1 (default email for this account, see "My Details")
jodieadore@gmail.com

REPORT EMAIL 2

REPORT EMAIL 3

Process:  Click the Submit button to register your light.
Data for your light will be available approximately 24 hours from the time the light is put
into actual service or powered up.

3. Process  Submit  Cancel
The following page will be displayed confirming successful registration of your Avlite GSM light. If required, you can edit the information entered for the light by selecting **EDIT**. You are also able to register another light if required by selecting **ADD+**.
**Edit GSM Light Information**

To modify the lights information:

1. Select **Configure** from the **GSM Dashboard** or select **Configuration Table** in the menu on the left of the page.

2. Locate the light you wish to modify and click on **EDIT** (this appears to the right of the light).

3. Modify the light details and click the **Submit** button at the bottom of the page.
4. The following screen will appear to inform you that your update was processed successfully.
Remove GSM Lights

To remove a light:

1. Select Configuration from the GSM Dashboard or select Configuration Table in the menu on the left of the page.

2. Locate the light you wish to remove and click on EDIT (this appears to the right of the light).

3. Click the Delete button at the bottom of the page to remove the selected light.
See Critical Light Data in Summary View Table

This will take you to a new page with a summary listing of all your GSM lights registered in the system.

1. Select **Configuration** from the **GSM Dashboard** or select **Configuration Table** in the menu on the left of the page.

2. The following table summary will appear:

![Configuration Table](image)

3. The background colour of a particular light will change to a red colour if an alarm condition is present.
Drill Down on Each Light to View All Data

This will take you to a new page showing detailed information for the GSM light selected.

1. Select **Configuration** from the **GSM Dashboard** or select **Configuration Table** in the menu on the left of the page.

2. The following table summary will appear:

![Configuration Table](image)

3. Click the cell-phone number of the light you wish to view in more detail.

4. The following detailed report for the light will appear in a new window.
   
   Breaks in the data represent periodic absence of data transmission or removal of light for servicing.
5. For help viewing detailed information about Charts, Data and Email Reporting click on the ‘i’ button to the left of the screen:
DEPLOYMENT MAP

The Deployment Map section of the GSM Dashboard enables you to do the following:

• See entire GSM light network in map view
• Click on items to see summary data
• Drill down on each light to view all data
This allows you to view the location of your GSM Light installations via map.

1. Select **Deployment Map** from the **GSM Dashboard** or select **Deployment Map** in the menu on the left of the page.

2. A map of your GSM lights will appear with the Avlite Logo indicating the location of your installation(s). Use the zoom in/out tool bar at the top left of the page to navigate around the map.

3. To see summary data for a specific light, click on the Avlite icon on the map. A call-out box appears on the map with the summary data of the light.

4. The Avlite Logo will be highlighted as a warning symbol if an alarm condition occurs.

5. To drill down on the light to view all data, click on **View Full Details** in the call-out box and a new window will open displaying detailed information about the light.
REQUEST HELP

The Request Help menu of the GSM Dashboard enables you to submit a form to Avlite to request assistance from an Avlite GSM expert.
1. Select **Request Help** from the **GSM Dashboard** or select **HELP!!** in the menu on the left of the page.

2. The following form will appear.

3. Complete the details.

4. Click **Submit**
CHANGE PASSWORD

The Change Password menu of the GSM Dashboard enables you to change your password:
1. Select **Change Password** from the **GSM Dashboard** or select **Change Password** in the menu on the left of the page.

2. Complete the details.

3. Click **Submit**

**REMEMBER TO LOG OUT WHEN YOU HAVE FINISHED VIEWING YOUR GSM LIGHT DATA**

(click “Log Out” in the menu on the left of the page)
Light Installation Location

The light must be installed in a location where there is adequate GSM and if fitted GPS signal coverage from your service provider.

Final GPS location of your light can be obtained via SMS text message once it is installed and the power is connected.

Data will not be available from the GSM Monitoring and Alarm System for a minimum of 1 minute after the power has been connected.

**GSM MONITORING AND ALARM LIGHTS: DESIGNATED LIGHTS SIM CARD NUMBERS**

<table>
<thead>
<tr>
<th>Light Name (eg. Channel Light 1)</th>
<th>Installation Location</th>
<th>Cell phone Number (eg. +61432123456)</th>
<th>Master Telephone Number (eg. +61456123456)</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>Light Name</td>
<td>Contact Name</td>
<td>Cell phone Number (eg. +61432123456)</td>
<td></td>
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</tr>
</tbody>
</table>
## REMOTE REPORT CELL PHONE NUMBERS & EMAIL CONTACTS

<table>
<thead>
<tr>
<th>Light Name</th>
<th>Contact Name</th>
<th>Cell phone Number (eg. +61432123456)</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Initial Setup

The most important step in the process of setting up your GSM monitoring and alarm module is to ensure desired cell phone numbers are programmed into the access list.

Use the list access command (see “Sending Commands” on page 20) to confirm cell phone numbers are correctly entered. Re-enter from a correctly listed cell phone the numbers required.

If the initial access list number(s) are incorrectly entered, lost, or if the light’s cell phone number will not respond, power up the light and email Avlite technicians (info@Avlite.com) the following details:

- Designated Light SIM Card Number
- Country Code
- Light Serial Number **

** Please Note: A charge may be levied for this service

Web Reporting

If no data is available from your secure web login after following the outlined procedure:

- Send the SMS text message “list alarm” to check that the alarm to the web has is enabled
- If the alarm has been enabled, then re-send the SMS text message “add web +61416906478” to ensure the gateway is open.
### Trouble Shooting Table

<table>
<thead>
<tr>
<th>Problem</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Light will not activate. | • Ensure light 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. |
| Timing codes will not change. | • Turn rotary switches several times to ensure contacts are clear. |
| Light will not operate for the entire night. | • Expose light to direct sunlight and monitor operation for several days.  
Avlite products typically require 1.5 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.  
• 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. |
| My light won’t respond to the 1st message I send on setup. | • Ensure SIM card is active, has credit, and is fitted correctly.  
• Ensure there is no PASSWORD on the SIM card account and the SIM Card is unlocked. |
| My SMS reports are sometimes showing N/A or reports that “no data” has been received. | • This indicates that the GPS or battery charge at night is not available. Otherwise the light may have failed therefore responding with a reading of “N/A” (not available). Contact Avlite for further help. |
| When I send an SMS there is no SMS response from the light within 5-20 minutes. | • The cell phone monitoring system is reliant on cell phone coverage and gateway traffic, and may suffer from occasional drop outs, or the light may be located in a marginal GSM coverage area (check with your local network provider for coverage details). One or all of these parameters affect the performance of your monitoring system.  
• The GSM implements a sleep cycle to save power. Under normal conditions the GSM will be put to sleep for 3 hours at a time. |
| When I send an SMS there is no response. | • Check the number you are ringing from is listed in the access list or the report list.  
• Try sending the SMS from a different phone using a different network. |
**Light Board Indicator / Status LED’s**

All Avlite light boards are fitted with two Indicator LED’s. These are positioned on the edge of the board, near the Flash Code Rotary Switches. Use the table below to help determine operational status.

<table>
<thead>
<tr>
<th>Yellow Status LED</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Daylight, Standby</td>
</tr>
<tr>
<td>Quick Flashing</td>
<td>Day to Night transition</td>
</tr>
<tr>
<td>2 Quick Flashes</td>
<td>Night Operation, Not Synchronized</td>
</tr>
<tr>
<td>1 Quick Flash</td>
<td>Night Operation, Sync in Progress</td>
</tr>
<tr>
<td>Slow Flashing</td>
<td>Night Operation, Synchronized</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Red Status LED</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady</td>
<td>Flat Battery cutoff is in effect (Below 10.0V)</td>
</tr>
<tr>
<td>Slow</td>
<td>High Voltage (Above 13.5V)</td>
</tr>
<tr>
<td>Off</td>
<td>Optimal Voltage (12.5V to 13.5V)</td>
</tr>
<tr>
<td>1 Quick</td>
<td>Ok Voltage (12.0V to 12.5V)</td>
</tr>
<tr>
<td>2 Quick</td>
<td>Low Voltage (11.5V to 12.0V)</td>
</tr>
<tr>
<td>3 Quick</td>
<td>Poor Voltage (10.0V to 11.5V)</td>
</tr>
<tr>
<td>4 Quick</td>
<td>Flat Voltage (Below 10.0V)</td>
</tr>
</tbody>
</table>
Phone Module Indicator / Status LED’s

The GSM board is fitted with a number of Indicator LED’s. Use the diagram below to help determine operational status.

To view Indicator LED’s follow the steps shown on in the “Installing a SIM Card” section of this manual.

<table>
<thead>
<tr>
<th>LED Combinations</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steady</strong></td>
<td>Off</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td><strong>Steady</strong></td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Off</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The setup of the GSM module has failed. Check that the module is present. Reset the unit and try again. Note: The unit will automatically reset within 1 hour and try again.</td>
</tr>
<tr>
<td><strong>Slow</strong></td>
<td>Steady</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Steady</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The GSM module is in the process of being setup. The SIM card has failed. Check that the SIM card is present and inserted correctly.</td>
</tr>
<tr>
<td><strong>1 Quick</strong></td>
<td>1 Quick</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Steady</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The GSM module setup is complete. The SIM card is ready for operation. The signal is not detectable. Check that the antenna is present and connected to the GSM module.</td>
</tr>
<tr>
<td><strong>1 Quick</strong></td>
<td>1 Quick</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The GSM module setup is complete. The SIM card is ready for operation. The network is NOT ready.</td>
</tr>
<tr>
<td><strong>1 Quick</strong></td>
<td>1 Quick</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td>1 Quick (Low) 2 Quick (OK) 3 Quick (Good) 4 Quick (Max)</td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>The GSM module setup is complete. The SIM card is ready for operation. The network is ready. The yellow status LED indicates signal strength.</td>
</tr>
<tr>
<td><strong>2 Quick</strong></td>
<td>Off</td>
</tr>
<tr>
<td><strong>Red LED</strong></td>
<td>Off</td>
</tr>
<tr>
<td><strong>Yellow LED</strong></td>
<td>Off</td>
</tr>
<tr>
<td><strong>Condition</strong></td>
<td>GSM Module setup is complete and the GSM module is asleep.</td>
</tr>
</tbody>
</table>
Activating the Warranty
Upon purchase, the Avlite Systems warranty must be activated for recognition of future claims. To do this you have two (2) options:

1. **Postal Registration**
   Please complete the Avlite Systems Warranty Registration Card and return to Avlite within 30 days of your purchase.

2. **Online Registration**
   Please complete the Online Registration Form at: www.avlite.com

**Avlite Systems 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 Avlite freight prepaid.**

**Warranty Terms**

1. Avlite Systems warrants that any Avlite aviation 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. Avlite Systems warrants that any rotationally-moulded products (“Roto-Moulded Products”) and accessory products (“Accessory 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. Avlite Systems warrants that any Avlite aviation products other than the Telemetry Products, Roto-Moulded Products and Accessory Products (“Avlite 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.

4. Avlite Systems will repair or replace, at Avlite’s sole discretion, any Telemetry Products, Roto-Moulded Products, Accessory Products or Avlite 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.

5. If any Telemetry Products or Avlite Products are fitted with a rechargeable battery, Avlite Systems 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 Avlite;
   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 Avlite or authorised Avlite repair personnel.
3. The customer must give Avlite Systems 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 Avlite shall be made without written approval of Avlite Systems.

6. Avlite 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 Avlite Systems by the customer at his or her sole expense. Avlite Systems 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, Avlite Systems will assess the product and advise the customer as to whether the claimed defect is covered by this warranty.

8. Avlite Systems 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 Avlite or any other person who is an agent, employee, or other representative or affiliate of Avlite, 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 Avlite Systems under this Warranty will be, at the option of Avlite Systems, limited to either the replacement or repair of any defective product covered by this Warranty. Avlite Systems will not be liable to Buyer for consequential damages resulting from any defect or deficiencies in accepted items.

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
Avlite Systems 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, Avlite Systems will fulfil the conditions of the warranty. Such product must be returned at the owner’s expense to the Avlite Systems 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.

Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor. Avlite products are subject to certain Australian and worldwide patent applications.

Latest products and information available at www.avlite.com
Other Avlite Products Available

Solar Aviation Lighting

Obstruction Lighting

Helipad Lighting

Airfield Markers & Accessories

Area & Sign Lighting

Typical Applications

• Temporary & permanent airfield lighting
• Remote, emergency & defence airfield lighting
• Barricade, hazard & perimeter lighting
• Helipad lighting
• Obstruction lighting

For a complete list of product compliances including ICAO & FAA, please contact Avlite today

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