

**ODSL 200**  
Omni-directional LED sector light

**Product Manual**

**Version: 1.06**  
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# 1. Introduction

The ODSL 200 omni-directional sector light is an innovative, compact sector lantern with accurate factory pre-aligned sector borders. It should be mounted on a fixed base. The sectors are fully verified at Sabik photometric range prior to delivery. The lantern is equipped with a replaceable LED optical unit. The range of the lantern, depending on colour and flash character, is between 6 and 10 NM ( $T_c = 0,74$ ). The lantern uses patented omni-directional LED sector light technology.

## 1.1. Standard Features

- The sectors are fully verified at Sabik photometric range prior to delivery
  - The standard sector light is available as a 3 or 6 layer (tier) model
  - Programmable with the wireless Sabik easyProgrammer or USB/IR interface
  - Light (LED) unit easily replaceable (in the field) without interfering with sector alignment
  - Mounting in existing housing or outdoors (external weather cover)
  - Low power consumption, ideal for solar powered systems
  - Field installation is easy thanks to the rotation mechanism in the base
- Precision alignment referring to a landmark at site (with bearing to landmark given to Sabik in advance), can be done with aid of a gun sight (this function has to be ordered separately)

## 1.2. Optional Features

- GSM LightGuard Monitoring & Control
- GPS Synchronization
- Optical Feedback
- Night time reduction if operated day and night
- Weather cover for outdoor installations
- Sighting scope

## 1.3. Options Matrix

Type	Description	Product Code
Optical Feedback System	Integrated LED performance measurement	OPT1
GPS sync	Integrated GPS sync excluding GPS antenna	OPT4
External GPS	External GPS antenna for OPT 4	OPT7
LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/GPS antennas	OPT9
LightGuard GSM	Integrated GSM based monitoring including GSM antenna	OPT10

## 1.4. Product Codes

ODSL 200 3 LAYERS	ODSL 200 6 LAYERS	ODSL 200 3 LAYERS With Weather cover	ODSL 200 6 LAYERS With Weather cover
ODSL 200-3	ODSL 200-6	ODSL 200-3WC	ODSL 200-6WC

Every lantern has also a type specific customer code, which is needed if you have to order a replacement or similar lantern.

## 2. Technical Details

High intensity precision range light Intensity adjustable from 5% to 100%

Factory assembled light module fully waterproof, IP67, with PTFE vent for pressure equalization. Precision laser cut sector unit ensuring a very small area of uncertainty between the sectors, typically less than 0,5°.

Every lantern is labelled according to the customer's code, ensuring easy ordering of duplicate units or spare parts.

Standard IALA colours Red, Green, White and Yellow. Flasher with daylight switch is integrated in lantern. Integrated 16 ampere PWM solar panel regulator

### 2.1. Main Technical Specification

Type	Description
<b>Lens visual/Mechanical diameter</b>	200mm
<b>Lens material</b>	UV stabilized Acrylic
<b>Light source</b>	Light Emitting Diodes (LEDs)
<b>Vertical divergence</b>	2° @ 50% ( $\pm 1^\circ$ ) of peak intensity (FWHM)
<b>Unit lifetime</b>	Up to 10 years
<b>Weight (lantern only)</b>	3-tier: 10,5kg, 6-tier: 12,4kg
<b>Weight (with weather cover)</b>	3-tier: 14kg, 6-tier: 16,9kg
<b>Operating temperature range</b>	-40°C to +60°C
<b>Supply voltage</b>	9VDC to 30VDC
<b>Solar panel charger</b>	16A PWM charger
<b>Power consumption</b>	Max 3,5W / tier
<b>Degree of protection</b>	IP67

### 2.2. Optical Performance

#### Typical Maximum Fixed Luminous Intensity

	Power	Red	Green	White
<b>Intensity per tier</b>	<b>3,5W</b>	<b>250 cd</b>	<b>250 cd</b>	<b>600cd</b>

The actual visual range of the lantern is depending on the effective intensity, flash length and intensity setting of lantern. The effective intensity and hence the range of a single flash character should be calculated by means of Schmidt-Clausen as recommended in the IALA recommendation E-200 Part 4.

## 2.3. Power Consumption

The lantern is designed for a wide range of power supplies including solar power, primary battery and other DC supplies. A high overall efficiency is maintained over a wide range of supply voltages, and daytime idle consumption and consumption between flashes is minimized. You can calculate the total energy consumption using the values from the table below.

Specification	Value per Tier
<b>Standard configuration</b>	
Input voltage range	10VDC to 32VDC
Power consumption/tier	3,5 W ( $\pm 10\%$ ) at full intensity
Daytime idle consumption	5 mW (less than 0.4mA @ 12 VDC)
Consumption between flashes	12 mW (less than 1.0 mA @ 12 VDC)
<b>With options</b>	
<b>Add to the above values</b>	
GPS module installed	+ 12 mW (less than 1.0 mA @ 12 VDC)
GSM module installed	+ 12 mW (less than 1.0 mA @ 12 VDC)
OFBS module installed / tier	+ 25 mW (less than 2.0 mA @ 12 VDC)
Standby battery card installed	+ 12 mW (less than 1.0 mA @ 12 VDC)

**The lantern intensity and hence power consumption can be adjusted between 5% and 100% depending on range required.** The overall daily power consumption is depending on duty cycle of character, intensity setting and setting of daylight sensor (when to turn on/off).

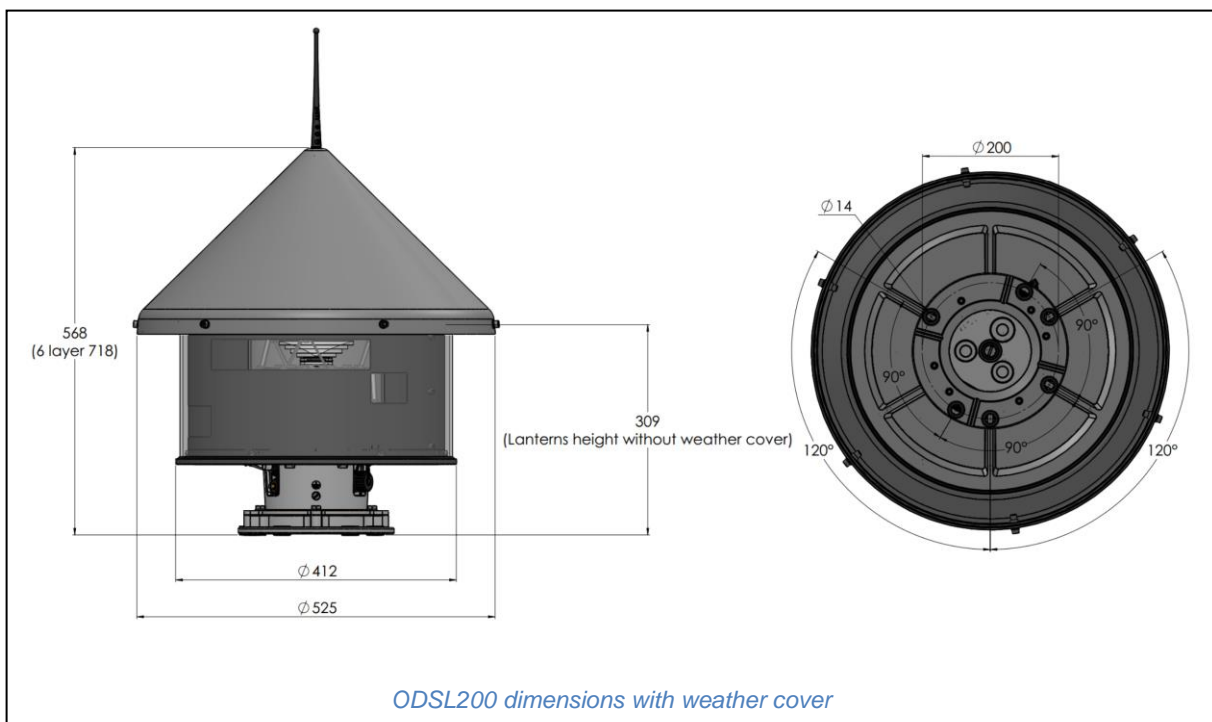
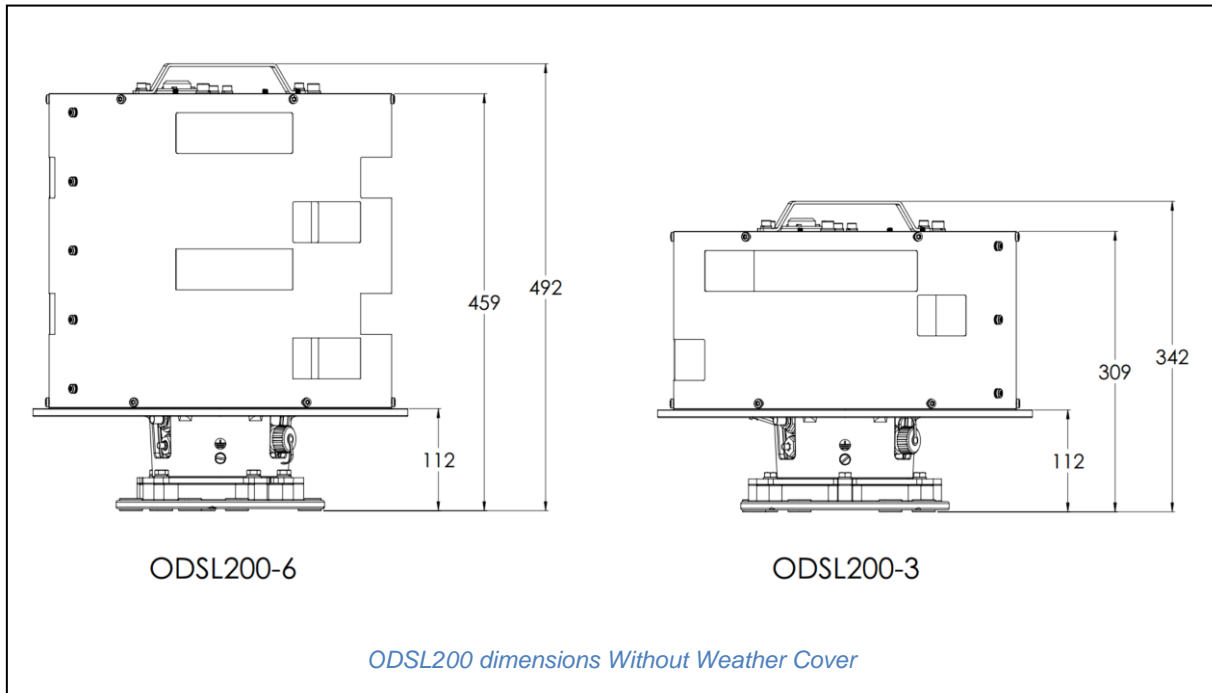
When calculating the daily power consumption also the consumption between flashes and the consumption of any of the options installed should be considered.

**Example** of daily power consumption, 1 tier, no options:

**Q:** Lantern set to 50% intensity and a FI 3s (0.3+2.7=3s), 14 hours daily operation.

**A:** Active consumption =  $50\% \times 12W \times (0.3/3s) \times 14h = 8.4 \text{ Wh}$   
 Idle consumption =  $[(3-0.3)/3s \times 0.012W \times 14h] + [0.005W \times 10h] = 0.1512 \text{ Wh} + 0.05 \text{ Wh} = 0.2\text{Wh}$   
**Total daily consumption = 8.4Wh + 0.2Wh = 8.6 Wh**

## 2.4. Dimensions and Mechanical Properties



The ODSL200 unit has a very narrow beam and is therefore suitable only for fixed applications. The mounting flange is designed to be compatible with the 3 or 4 (M12) bolt mounting pattern at a bolt spacing diameter of 200mm, a common mounting arrangement for Marine Navigation Lanterns. Plastic insulators should be used to prevent galvanic contact with the mounting platform, as well as protect the painting on the mounting flange during installation.

The optical unit (including possible GPS/GSM modules) is replaceable without de-attaching the lantern from its base. This arrangement makes the lantern very service friendly.

The optical unit is fully waterproof and pressure tested at factory before shipment. Breathing is arranged through a PTFE membrane mounted on the underside of the assembly, enabling the lantern to equalize pressure without the risk of letting moisture into the lantern. If the lantern is to be mounted outdoor, it must be fitted with a (optional) weather cover. The cover roof design also protects the lantern from bird excrement. There is no need for bird deterrent spikes.

**There are no serviceable parts inside the lantern.** If the lantern is equipped with Sabik LightGuard, and you must install/change the SIM card – please contact Sabik for instructions.



*Weather Cover*

## 2.4.1. Mechanical properties

Specification	Value
<b>3 tier and 6 tier</b>	
<b>Weight</b>	10,5kg single 3 tier version 12,4kg single 6 tier version 14kg 3 tier with weather cover 16,9kg 6 tier with weather cover
<b>Base material</b>	Marine grade die cast aluminium, anodized and powder painted grey RAL 70
<b>Total height</b>	3 tier: 342mm 6 tier: 492mm
<b>Total height (including weather cover)</b>	3 tier: 586mm 6 tier: 736mm
<b>Lantern diameter</b>	412mm, weather cover: 525mm
<b>Mounting base</b>	3 or 4 M12 bolts at radius of 200mm. The base has 12 equally spaced slots accepting up to M14 bolts

## 2.5. Environmental

The lantern is designed for the marine conditions including exposure for high UV radiation and salt spray. The robust aluminium housing and the special polycarbonate lens is designed to survive the harsh conditions present in the marine environment. See the appendix regarding disposal and recycling.

The lantern is fully waterproof and pressure tested at factory before shipment.



*PTFE breathing vent*



### 3. Electrical

The ODSL 200 lantern can be operated on primary battery, solar system or on mains power system using an AC/DC converter. The built-in solar panel regulator makes it easy to use solar power for the lantern. In section 5.1 the connection of various type of power supplies are explained. To utilize the solar facility a 3 wire system is required. The ODSL 200 comes fitted with a standard protection degree IP 68 (Phoenix contacts) power connector fitted on the optical unit.

#### 3.1. Solar Charger

A fully programmable solar panel regulator capable of handling up to 16 amperes is integrated in the lantern, enabling the lantern to control solar panel charging directly without the need to install external chargers. The charger settings are programmable by the user enabling the lantern to be connected to various types of batteries and power supplies.

The solar panel charger is a series charging regulator with temperature compensation (built-in sensor). The solar panel output is controlled by Pulse Width Modulation (PWM) in order to optimize the charging process.

In the table below you can find the typical settings for both lead acid and open cell nickel cadmium types of batteries in 12 volt systems. For other types of batteries and other types of nominal voltages, please consult your battery manufacturer for the corresponding values:

Recommended charger settings for a 12 V system

Charger settings	VR Lead Acid	Nickel Cadmium
Cut In Voltage	13.8 V	14.8 V
Cut Out Voltage	14.4 V	15.2 V
Temperature compensation	-10 mV/°C	-30 mV/°C

Attn: Because the built-in charger is fully programmable, other types of battery chemistry's, like Nickel Metal Hydride, can also be charged safely by the lantern.

#### 3.2. PWM Charging

##### Minimum Battery Voltage (9 to 32 volts)

The minimum battery voltage is set to protect the battery from excessive discharge. If this point is reached the function will switch the lantern off but continue to monitor battery voltage. The lantern will stay in idle mode until the batteries are replaced or recharged to the reconnecting level (see below).

##### Reconnecting Voltage Hysteresis (0.1 to 26 volts)

When the battery voltage drops below the set minimum battery voltage, the beaconing is disabled. The reconnecting voltage hysteresis set point controls the amount by which the battery voltage must rise before the flasher switches the lantern back on.

The setting will vary depending on the characteristics of the battery or the needs of the user.

#### 3.3. Other DC Power Supply

When using AC/DC main operated power supplies, special attention should be paid to make sure that the power supply selected is capable of powering the unit. Especially the ripple, the transient current capability and inductance should be checked against the requirement of the lantern.

## 3.4. Cable Synchronization

The lantern comes with a cable sync port as standard. The sync line is a two-way signal enabling multiple lanterns to be synchronized to flash simultaneously or in sequences by connecting all lanterns to the same sync line.

The user needs to enable this function in the lantern if he wants to utilize this function. The user can set sync offsets in order to enable running light patterns or alternating lights.

### 3.4.1. Lantern Synchronizing

Synchronizing can be done by means of cables or GPS sync unit. Please refer to the installation chapter for information regarding connecting the cable synchronization.

Synchronizing offset is used to program a delay in the lantern to make it flash a set period after the master. This is particularly useful in complex fairways where a pattern of running lights enables the mariner to see the fairway against conflicting lights. Other common special effects as flip-flop (alternating lights) etc. is also possible to configure.

This offset can be programmed from 0.1 to 325 seconds. The synchronizing period must not exceed the flash character period.

## 3.5. Flasher

### Led Lantern Intensity (5 to 100%)

The lantern intensity and hence power consumption can be adjusted between 5% and 100% depending on range required.

The microprocessor controls the intensity by means of pulse width modulation. The frequency has been set at 125 Hz to eliminate any flicker and the output is a square wave with an RMS (Root Mean Square = effective) value of the programmed set point.

### Character Settings (1 to 10 time pairs)

The characters are set as time pairs. A time pair is the flash and eclipse time in one period. These are stored as lamp ON/OFF time values. There can be up to 10 of these time pairs making up the character of the lamp. The minimum length of one setting is 0.05 seconds and the maximum time is 650 seconds.

To enable fast and easy programming of characters, a set of standard characters are programmed in the memory of the various programmers.

## 3.6. Light Sensor and Light Automation

The combined light sensor and IR transceiver are located at the base of the lantern as shown in the picture.

### Light Automation

Normally the lantern works with a photo sensor that switches the lantern on at night and off in the daytime. However, this feature can be overridden to force the lantern to idle or active (flashing) mode. The lantern can in addition be programmed to Day-lantern mode. When programmed to Day-lantern mode it will flash with 100% intensity during day-time and revert to the programmed intensity level during night-time.

### Photocell Threshold Level (5 to 250 lux)

The flasher measures the illumination level through the photo sensor. The range of the photocell is from 5 lux to 250 lux. The threshold level can be set in steps of 1 lux.



### Photocell Hysteresis (5 to 250 lux)

The range of the photocell is adjustable from 5 lux to 250 lux. The hysteresis level can be set in steps of 1 lux. The maximum allowed setting depends on the Photocell Threshold Level.

The light sensor threshold is configured to ambient luminance level (lux) and the user can also program the hysteresis between turning ON and turning OFF the light.

The factory default setting is to switch on the light at 15 lux and off at 60 lux. The built-in light sensor can also be utilized even if the lantern is set to fixed light, as it is not exposed to the light emitted by the unit itself.

## 3.7. Dated Shut-down

The dated shut-down feature is a software dependent option, which can be enabled with the Sabik Programmer Lite. By setting a shut-down date and a start-up date in the controller, the lantern can be switched off to save power during times when channels/fairways are closed.

For detailed instructions on how to enable this function please refer to the Programmer manuals.

## 4. Optional features

### 4.1. LightGuard SMC MKII Monitoring & Control

The LightGuard module Remote Monitoring and Control features are integrated in the lantern. A SIM card will be required. All the important configuration values needed for the remote monitoring section are stored in the non-volatile memory area of the SMC.

More information is provided in the LightGuard SMC MKII user manual.



The following key monitoring features are available:

- **Alarm and Status reporting** – The LightGuard Module can be setup to report on Day/Night change or at a certain time of day e.g. at midnight. The report is sent automatically to LightGuard Monitor and includes all data available from the lantern e.g. battery voltage, consumption, production, error status, temperature, operating hours, daylight-sensor status. In case of a fail: low battery voltage, collision etc. the LightGuard module will report immediately.
- **Light On Demand** – By command the light can be activated remotely independent off the daylight sensor.

In combination with the optional GPS module additional features becomes available:

- **Out of Position Alarm** – LightGuard will monitor the GPS position and report if the buoy moves outside the position. An acceptable moving radius of the buoy can be defined. Normally not required for fixed stations.
- **High Accuracy Position Determination** – Once per day LightGuard will determine the actual position with an accuracy of down to +/- 1 meter and add the result to the status report. Normally not required for fixed stations.
- **Synchronizing** - the light can be synchronized with other lights equipped with same option.

The LightGuard unit is fully integrated in the design of the lantern. For detailed information on the LightGuard functionality and configuration please refer to the “LightGuard MKII” user manual.

## 4.2. GPS synchronization

The GPS synchronization feature is an additional hardware and a software dependent option. By adding the GPS module and an external GPS antenna and by enabling the synchronization with the Sabik PDA Programmer in the controller, lanterns can be synchronized via satellite. By altering the synchronization offset parameter in the controller, a running light or sequential light pattern can be created. If LightGuard remote monitoring option is installed, the GPS will also be utilized for the position monitoring.

## 4.3. Optical Feedback

The Optical Feedback feature is a hardware dependent option. Light sensors are installed in the lantern and calibrated at the factory. If the LEDs are degrading or the LEDs fails, a value in % of initial intensity can be read. When the light output falls below a pre-defined level, an alarm will be set.

### **Optical Feedback System threshold level (0 to 100%)**

The Optical Feedback System (OFBS) is a standard feature in ODSL 200. This is an external microcontroller device integrated in the lantern and works as an external monitoring unit checking the performance of the LED's. The intensity level of the LED's are checked continuously and compared to the original intensity level when supplied from the factory, and deviation is reported back to flasher as an analogue signal on the "A" terminal of the flasher.

When supplied from factory the lantern will have 100% intensity, but as the LED's degrade when aging (or some LED's are lost) the intensity level measured by the OFBS unit will also decrease. With this setting, the user can set up the OFBS level when lantern should report failure (error state is initialized).

## 4.4. Event Log

The lantern can be configured to also store main events which can be retrieved by service technician using a Sabik programmer. All day / night transitions as well as any malfunction will be stored in the lantern, and can be download over the infrared port at any point. The lantern has room for a about three years of events. The data is stored in a non-volatile memory independent on external power supply.

## 4.5. Back-up Battery Interface

In some installations, a dual battery system may be desired. One main battery acting as the primary power supply source and a second battery, only to be utilized in case of main battery failure. For these applications an optional back-up Battery interface is available, enabling the connection of a second battery to the lantern.

With the back-up battery module inserted, the lantern controller will automatically switch to the back-up battery when the main battery fails or voltage drops below pre-set value. If powered by solar system, the controller will still keep on charging the main battery while consuming from the back-up battery. As soon as the main battery has recovered or the battery has been replaced, the controller will switch back to the main battery. The lantern also logs separately how many hours of operation have been consumed from the secondary battery, in order to determine if the secondary battery needs to be replaced. By using for example Lithium primary batteries with a very low self-discharge rate the secondary battery can have a useful lifetime of many years, if no power is consumed by the light.

A second cable entry or a 5 core cable needs to be fitted to the lantern for this functionality. The lantern detects when the back-up battery is present and enables this functionality automatically.

## 5. Commissioning

This chapter describes how to install, configure and test the lantern.

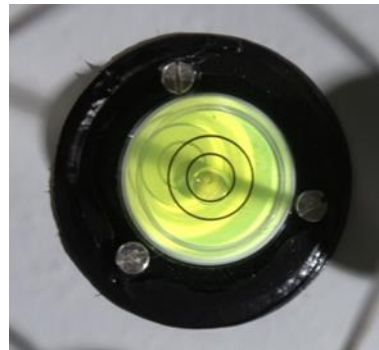
### 5.1. Levelling and Aligning

Each lantern is adjusted and tested at Sabik's photometric range prior to delivery. The lantern has a very uniform horizontal beam, which has to be properly aligned towards the horizon. When tested at the factory, the lantern's internal bubble level indicator is also calibrated. **Do not try to adjust the bubble level indicator**

(Explosive diagram can be referred to Appendix 11.1)



*Aligning Aids*



*Precision Bubble Level Indicator*

It is recommended that the lantern is installed using three bolts. The levelling is then much easier than trying to level the lantern with four bolts. Very precise alignment is possible using the (optional Product 821030) telescopic sight and a fixed landmark.

1. Place the lantern on 3 or 4 studs.
  2. Remove the weather cover to access the alignment aides.
  3. Adjust the horizontal level. Use the precise built-in level to aid the adjustment. **Do not loosen the telescopic sight!** When the level bubble is inside the smaller circle on the level indicator, the lantern is levelled to the horizon equal to or better than  $\pm 0.2^\circ$ . When the bubble is inside the larger circle, the lantern is levelled equal to better than  $\pm 0.4^\circ$ .
  4. Loosen the 6 sector alignment bolts (Part no 5) at the base of the lantern. Do not remove the bolts or collars (Parts no 4)!
  5. Using the telescopic sight, aim it at the predefined fixed landmark. The sectors are precisely crafted at the factory according to this landmark. **Do not use the telescopic sight for turning the lantern!**
- Note that removing the bolts and collars makes the lanterns balance unstable.**
6. Align carefully and tighten the bolts.
  7. Check, that the alignment is OK, if not re-align.
  8. Replace the roof and check that the weather-cover is clean.

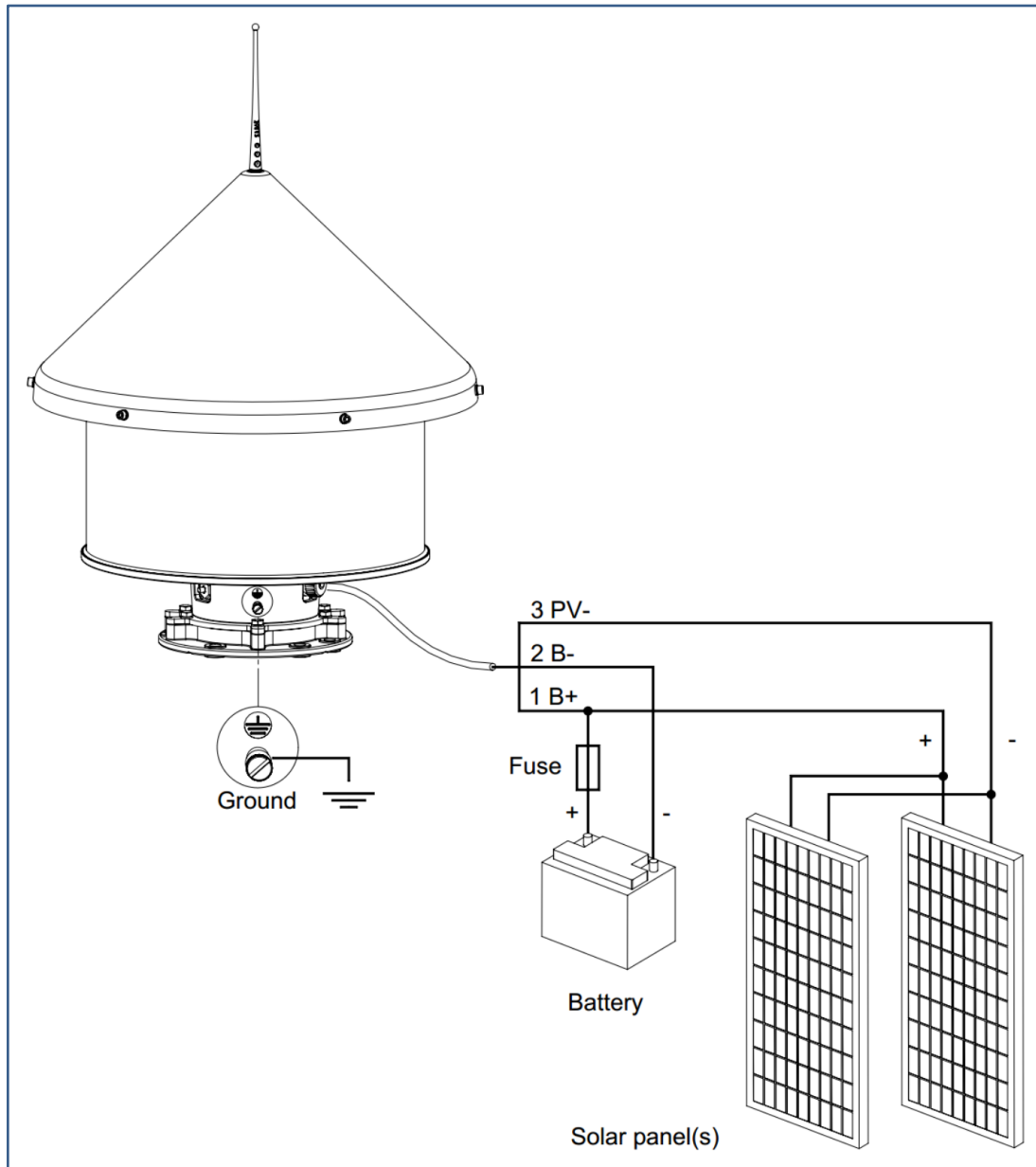


*Sector Alignment Bolts*

## 5.2. Electrical installation

This section describes a number of application examples to assist choosing the right configuration.

### 5.2.1. Solar powered system



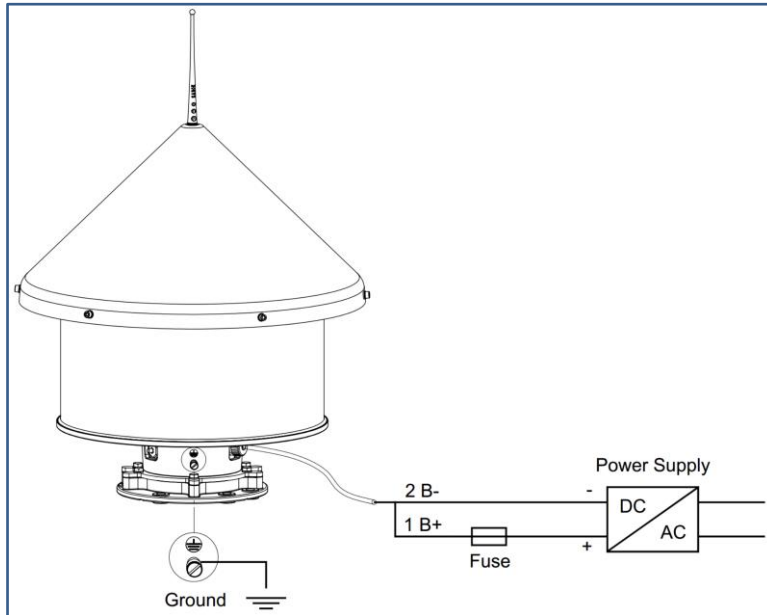
*Solar Power with Photovoltaic*

#### Common guidelines

- The maximum allowed solar panel current is 16A and must not be exceeded. In a standard 12V system 250W is the maximum size solar panel.
- It is recommended to install a 16 A fuse as close to the battery as possible.
- Long cables will result in power loss due to the voltage drop in the cable.

For correct charging functionality, the corresponding solar panel charging parameters should be set in accordance with the battery technology used. See chapter 3.1 for recommended values for lead acid and Nickel Cadmium batteries.

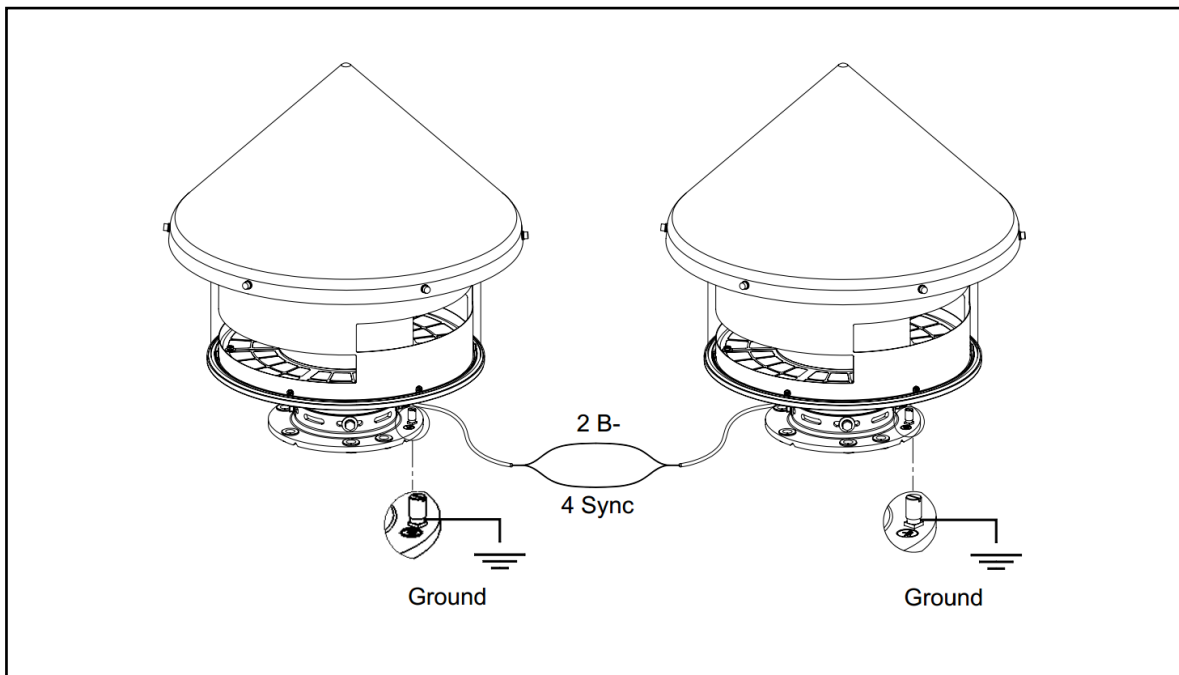
### 5.2.2. DC Power Supply



*DC Power Supply*

When using AC/DC main operated power supplies, special attention should be paid to make sure that the power supply selected is capable of powering the unit. Especially the ripple, the transient current capability and inductance should be checked against the requirement of the lantern.

### 5.2.3. Cable-synchronization



*Cable Synchronization*

The cable synchronization is based upon a self-organized 1-wire synchronization network. Any lantern in the network can act as a sync -master or -slave as soon as the “Cable sync” setting is enabled. Even though the sync signal is a bidirectional 1-wire sync, the units need to share common battery minus as shown in the picture below. A maximum number of 20 lanterns can be connected to the same cable-synchronization network.



### 5.3. EMC and Grounding

The lantern is tested for EMC in accordance with 89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC.

The lantern has good protection against interference, but in order for the protection to work as designed, the lantern needs to be properly grounded. **On the lantern base there is a grounding screw, which is the preferred grounding point of the lantern.**

Attach a cable from this grounding point to metal structure of the site. In installations where it is not possible to arrange for a direct grounding, the PE wire (green/yellow) in the power supply cable can be used.

**It is not recommended to have both grounding connections connected.**

On high structures that may attract lightning, additional lightning arresters should be considered to further protect the lantern installation.





## 5.4. Insert SIM Card (only lanterns with a GSM Module)

The GSM modem is installed inside the base of the lantern. The lantern base can be opened by opening the 6 hex screws that mount the base flange to the lantern base (part nr. 11 in section 11.1).

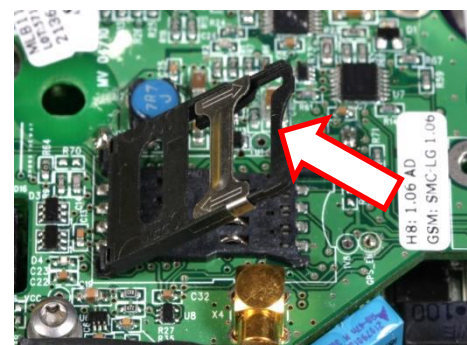
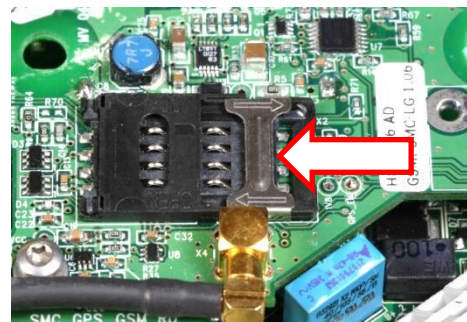
When the base is opened, the GSM modem is visible as shown in pictures below.

Attach a grounding strap and connect the clip to the protective earth (**green-yellow wire connector**) before touching the circuit board!

This is important, because static electricity could damage the sensitive electronics. If you don't have a grounding strap, please touch a grounded part of the circuit board (grounding connector) before touching any other parts.

Slide the SIM card holder metallic part to **OPEN**

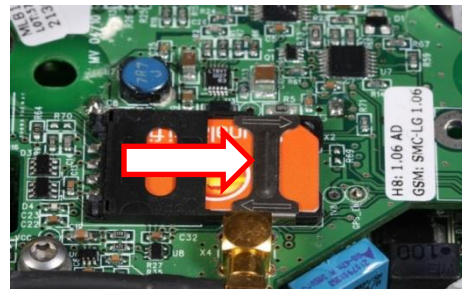
Lift up the holder



Insert/replace the card.

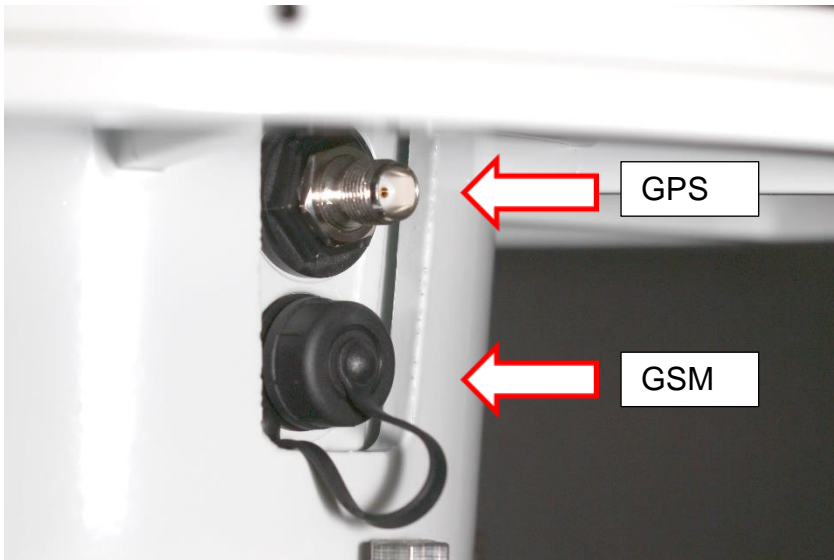


Press the holder down and slide the SIM card lock in order to secure the SIM card.



Complete the procedure by carefully assemble the lantern.  
Make shure not to damage the gaskets or sealing rings

## 5.5. GSM and GPS Sockets (optional)



*GPS and GSM Sockets*

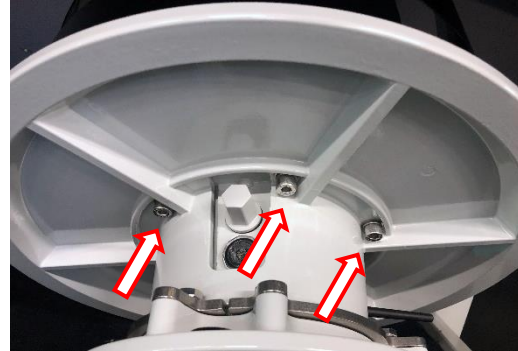
## 6. Replacing the light unit

Replacing of the light source does not require re-alignment of the lantern.

**Do not loosen the 4 sector alignment bolts at the base of the lantern!**

To replace the light unit you have to disconnect the power cord and, if the unit is equipped with GSM/GPS, the antennas

1. Remove the 6 Hexagon socket head cap screws M8x20 at the base of the unit (Part no 20).



2. Remove the roof (if equipped with it) and unscrew the three M8 Hexagon bolts (Part list no 9).



3. Carefully lift out the lamp unit.



4. The new light source will be delivered without the (optional) telescopic sight.

5. Lift carefully in the new unit aligning it according to the alignment marks and tighten the upper hex screws.  
6. Replace the 6 M8 Hex screws at the base.  
7. Connect the antennas (if needed) and the. Please use electrical insulation rubber tape to protect the antenna connectors. Fit the roof (if needed).



## 7. Programming

The lantern is programmable using Sabik easyProgrammer and smart phone (Android and iPhone) Bluetooth. Referred to Sabik easyProgrammer and Bluetooth manuals for more information. Both manuals can be found in Extranet at: [www.sabik-marine.com](http://www.sabik-marine.com)

## 8. Periodic Maintenance

The ODSL200 is a robust lantern designed to withstand heavy abuse and requires no maintenance, except for periodical lens cleaning. To maintain a good light output and achieve a long service life, it is advisable to visually inspect the lantern whenever visiting the site.

### **Mechanical inspection and maintenance:**

- Check that the lantern turns on by covering the photocell
- Check visually that the LEDs are equal and uniform intensity when lit
- Check that the lantern turns off by removing the cover
- Read controller values with the programmer and check the status
- Check battery voltage with the programmer. If battery voltage is low, replace the battery

## 9. Recycling and Disposal of products

### NOTICE!

**Incorrect handling or improper disposal can cause danger to the environment!**



There can be serious damage to the environment if substances hazardous to the environment are handled incorrectly and if they are disposed of incorrectly.

- Separate waste and dispose of it separately.
- Observe the disposal instructions on containers/packaging and safety data sheets.
- Have dangerous waste disposed of by companies specialising in disposal.
- Immediately take appropriate action if substances hazardous to the environment are accidentally released into the environment. If in doubt, inform the responsible local authority of the damage.

### Disposal

- Have electronic scrap, electronic components, lubricants and other auxiliary materials disposed of by specialist disposal companies.
- If in doubt, obtain information on environmentally-friendly disposal from the local authority or specific disposal specialists.

## Guidelines

Below you will find some guidelines:

### Electronic components

Electronic components and electronic scrap are classified as special waste and may only be disposed of by authorised specialist disposal companies.

### Metals, plastics, paper

Unless there is a return or disposal contract, the dismantled components must be sent for recycling: Scrap metals.

Send plastic elements and paper for recycling.

Dispose of the remaining components according to their material compositions.

### Greases, oils and other floating chemicals

Greases and oils contain toxic substances. They may not enter the environment. They must be disposed of by a company specialising in disposal.

### Batteries

The batteries contained in the back-up power supply contain toxic substances. They may not enter the environment. They must be disposed of by a company specialising in disposal.

## The Dismantling process

Proceed as follows to dismantle a device:

Unless there is a return or disposal contract, the dismantled components must be sent for recycling:

- Scrap metals.
- Plastic elements.
- Sort the remaining components and dispose of them according to their material compositions.

## 10. Troubleshooting

**Q:** I covered the photocell, but the lantern does not turn on.

**A1:** Read controller values with the programmer and check status. The battery voltage is below the minimum programmed value. Replace the battery.

**A2:** The dated shut-down feature may be enabled. Re-programme to disable shut-down feature

**A3:** Read controller values with the programmer and check status. The day light sensor setting or read value is abnormal. Re-programme if setting is wrong. Return the lantern for service if the read value is wrong.

**A4:** Read controller values with the programmer and check status. There is a LED failure error. Return the lantern for service.

**Q:** I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer.

**A:** Check the battery cables for damage or short-circuit. Replace the battery.

**Q:** I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer even though I replaced the battery.

**A:** Return the lantern for service.

**Q:** The lantern seems to work normally, but I cannot read it with the programmer.

**A1:** Locate the IR on your programmer and on the lantern. Face them against each other.

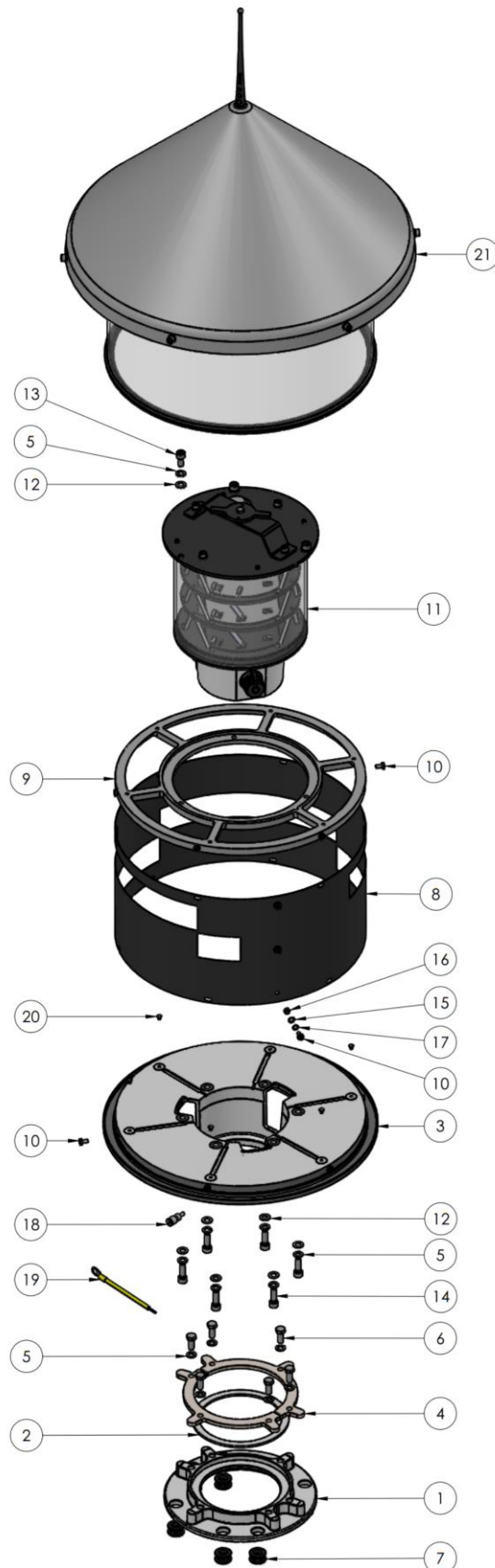
**A2:** Try to shade out the sun and put the programmer close to the lens during read process.

**A3:** Try different angles when reading, the light beam might block out the IR sensor.



## 11. APPENDICES

### 11.1. Explosion diagram



## 11.2. Part List

Part	Document Number	Sabik code	Title	Material	Qty
1	M101264		Rotateable Attachment flange	Al-6082-T6	1
2	M101265		Teflon flange 146-124x3	Teflon	1
3	M101263		Rotateable Lantern Base		1
4	M101266		Locking Flange	AISI 316 Stainless Steel Sheet (SS)	2
5	M100132	634395	Spring lock washer M8 DIN127 A4	A4	15
6	M100336	619227	Hexagon head bolt M8x20 DIN933	A4	6
7	M100046	644940	Bottomplate grounding bushing		12
8	M100767		Sector plate		1
9	M000936		Hat		1
10	M100054	618010	Torx screw M5x10 DIN7985 A4	A4	15
11	M000934		Light unit		1
12	M100097	634394	Washer M8 DIN125	A4	9
13	M100171	619287	Hexagon socket head cap screw M8x16 DIN912	A4	3
14	M100566		Hexagon socket head cap screw M8x25 DIN912 A4	A4	6
15	M100240	634326	Washer M5 DIN125	A4	3
16	M100253	631425	Hexagon nut M5 DIN934	AISI 316	3
17	M100057	636382	Spring lock washer M5 DIN127	A4	3
18	M100766	630132	Wego 11-MG M5		1
19	M100983		ODSL 200 PE-Wire		1
20	M101693		Barrel Plug LDPE Nat 4.6x5mm		6
21	M100986		ODSL 200 3 WC		1