

OBELUX HELIPORT BEACON

Heliport light



Manual - Obelux Heliport Beacon

ICAO Annex 14, Volume 2, 5th Edition (2020), Heliport Beacon

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CHANGELOG

Version	Date:	Description:	Author
0.1	07.03.2024	Document created	JSi
0.2	05.11.2024	ICAO reference updated	TRe
0.3	08.04.2025	Product code updated	TRe

1 ABOUT THIS PRODUCT

Heliport beacon provides a long-range visual guidance and identification of the heliport. The heliport beacon is located on or adjacent to the heliport preferably at an elevated position and so that it does not dazzle a pilot at short range.

Heliport beacon light provides up to 2500cd WHITE light and Night Vision Goggle (NVG) compliant infrared light (850nm). Light intensity depends on vertical angle. The light is using LED technology.

The light is Stand-alone and optionally supports Modbus operation. In Stand-alone mode, no external controllers are required to run the product. In most use cases, mounting the standalone aviation obstruction light and connecting power supply cable are the only actions needed to operate. In Modbus operation, the light is controlled with an Obelux controller as a part of an aviation light system.

The models come with built-in photocell that controls the intensity of the light automatically.

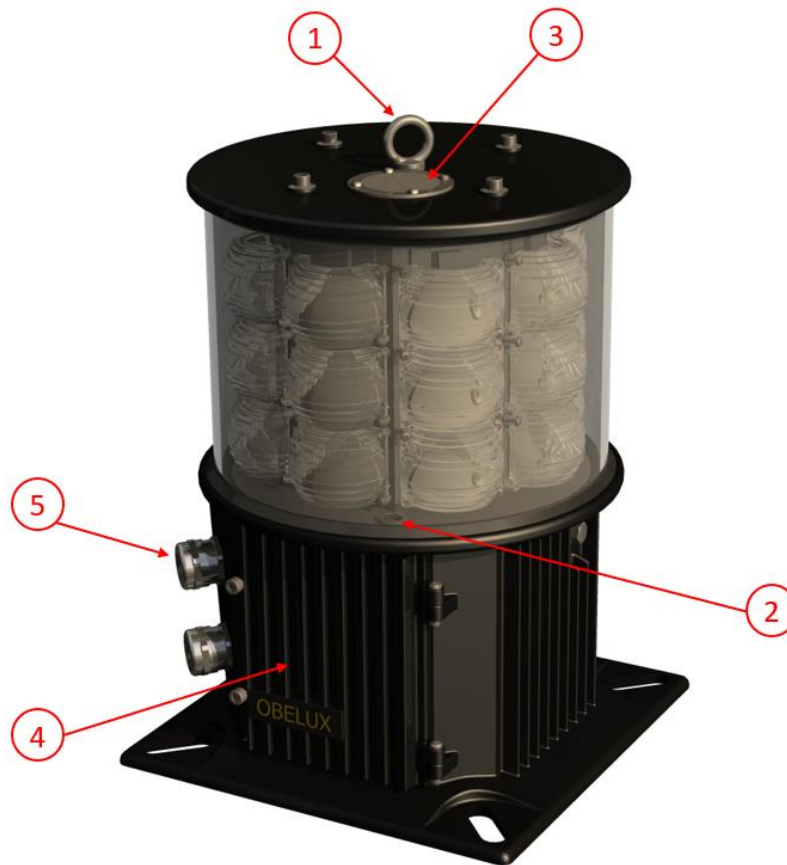


Figure 1: Main functional parts of the light

1. Lug (for lifting the light)
2. Spirit level (for levelling the light during installation)
3. Location of photocell
4. Service access hatch
5. Cable glands

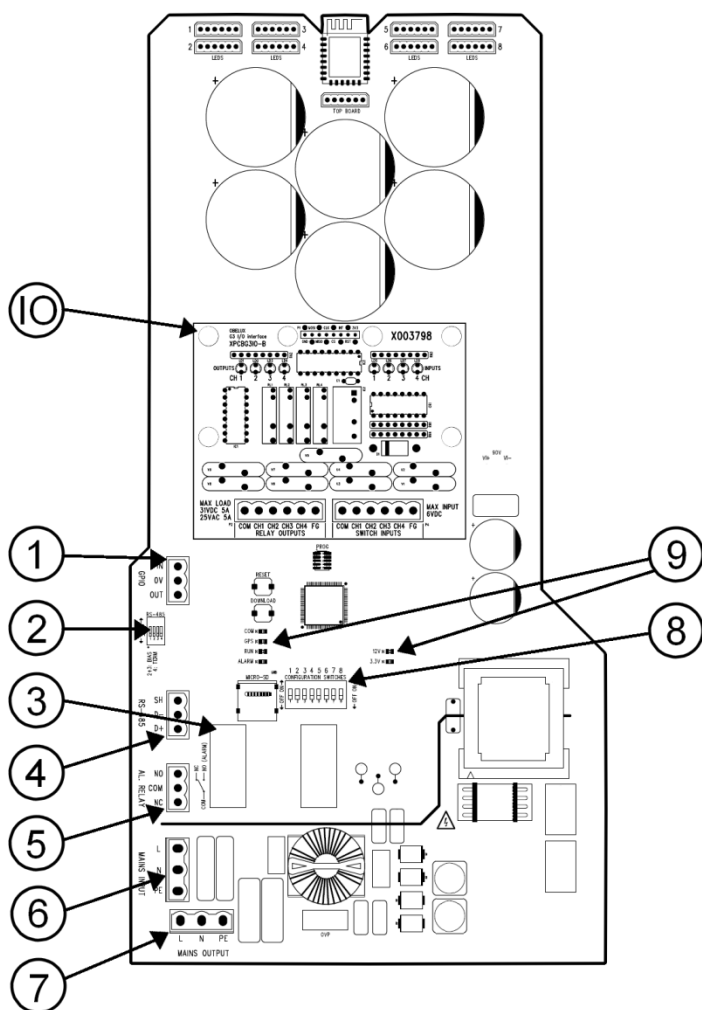


Figure 2: Main circuit board of the light

1. External signal input connector (GPIO)
2. RS-485 termination DIP switch (DIP switch 4)
3. Software version label
4. RS-485 (Modbus) connector
5. Alarm relay connector
6. Mains power input connector
7. Mains power output connector
8. Configuration DIP switches (1-8)
9. Status LEDs
- 10 = I/O card (control relay card)

1.1 Order codes

Order code	Output	ICAO	Op. volt.	GPS synch	Infrared	Packing dimensions
OBX-HB-ACW-001	2500cd	Heliport Beacon	90-265VAC	Yes	Yes	470x340x330mm, 16kg

2 SAFETY INSTRUCTIONS

In this section are general safety instructions for the device. Please read the instructions carefully before installing or using the device to avoid any personal, environmental or material damages.

2.1 General considerations

Install device observing manufactures installation guide.

Use only cables and connectors specified by the manufacturer and in compliance with local electrical code.

Keep your device away from heat sources, dust, smoke or other harmful substances.

Do not modify the device unless otherwise approved by the manufacturer.

If you have any error situation with the device, do not try to fix it by yourself, contact your reseller.

2.2 Environmental considerations

The European Parliament and the Council of European Union issued directive 2012/19/EU to contribute to sustainable production and consumption by, as a first priority, the prevention of WEEE and, in addition, by the re-use, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste and to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials.

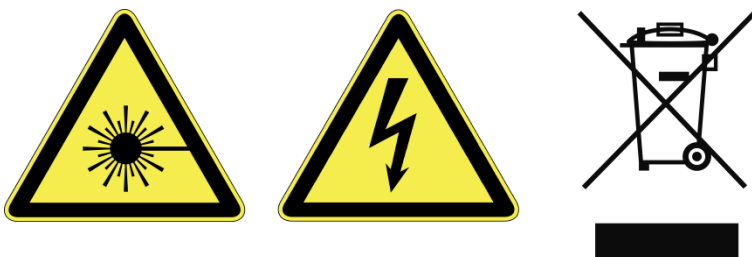
Obelux aviation obstacle light products sold inside European Union can be returned to manufacturer if no local WEEE separate collection and re-use services are available. Please contact Obelux for details.

Obelux does not refurbish returned items but forwards them to authorized WEEE treatment facility.

2.3 Personal considerations

HIGH VOLTAGE! Device contains high voltage which is very dangerous; do not try to service the device when it is powered on.

Obelux aviation obstruction lights are Class 2M LED devices. This class is safe for accidental viewing under all operating conditions. However, it may not be eye-safe for a person who deliberately stares into the LED beam by overcoming their natural aversion response to the very bright light.



3 INSTALLATION

3.1 Device installation

Mount the obstruction light to selected mounting point. The light comes with four bolt holes to mount it securely. One of the mounting points is not painted. This mounting point can be used as additional grounding point. Level the light using spirit level (bubble level) if necessary. Tighten bolts & nuts. Obelux recommends 100 Nm tightening torque for M12 hot-dipped 8.8 steel bolts with suitable washer between bolts and mounting plate. When the service access hatch (door) is open, check that there is no inflow of water (incl. hail and snow) into the light. Photocell is located on top of the light. Photocell should have an uninterrupted view of the sky to work correctly.

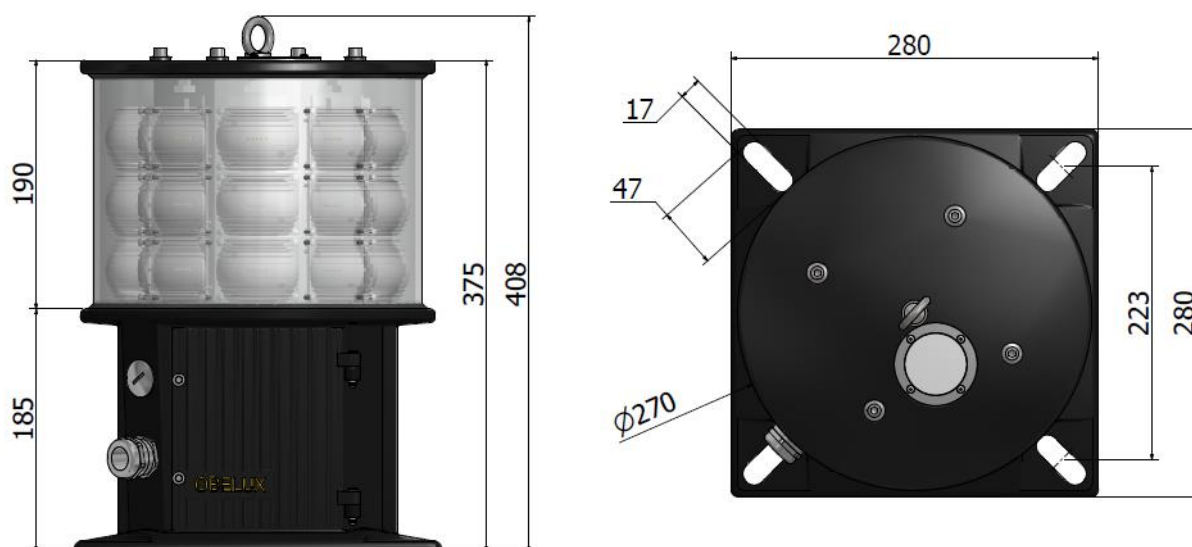


Figure 3: Dimensions in millimeters (mm)

3.2 Wiring

Route cables using cable glands on side of the light. Connect the cable wires securely to appropriate terminal block connectors. Connectors can be disconnected from the terminals on the main circuit board for easier access. Second row of terminals in the Alarm relay / RS-485 connector can be used to distribute alarm and data signals to next light.

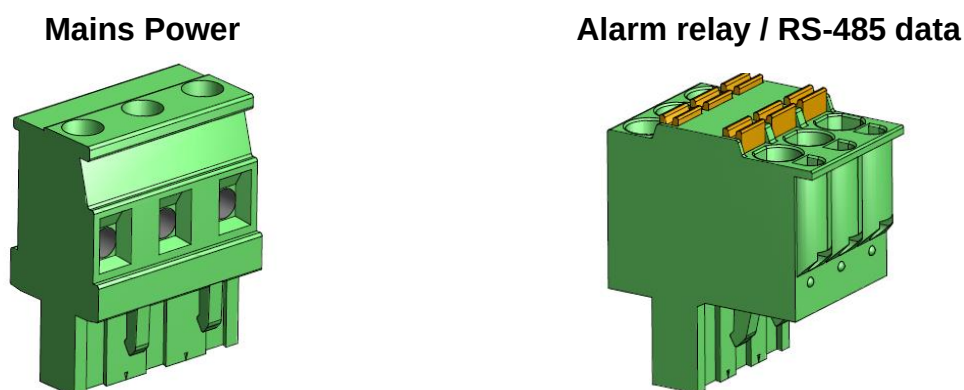


Figure 4: Terminal block connectors

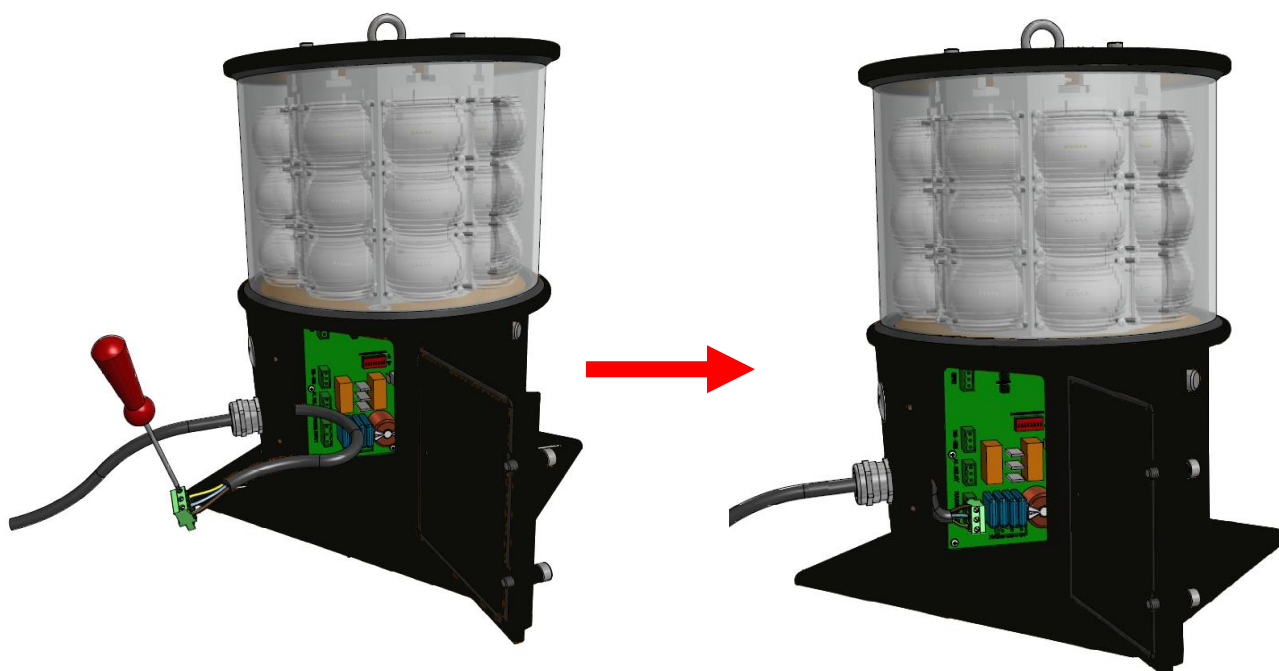


Figure 5: Wiring the Mains Input

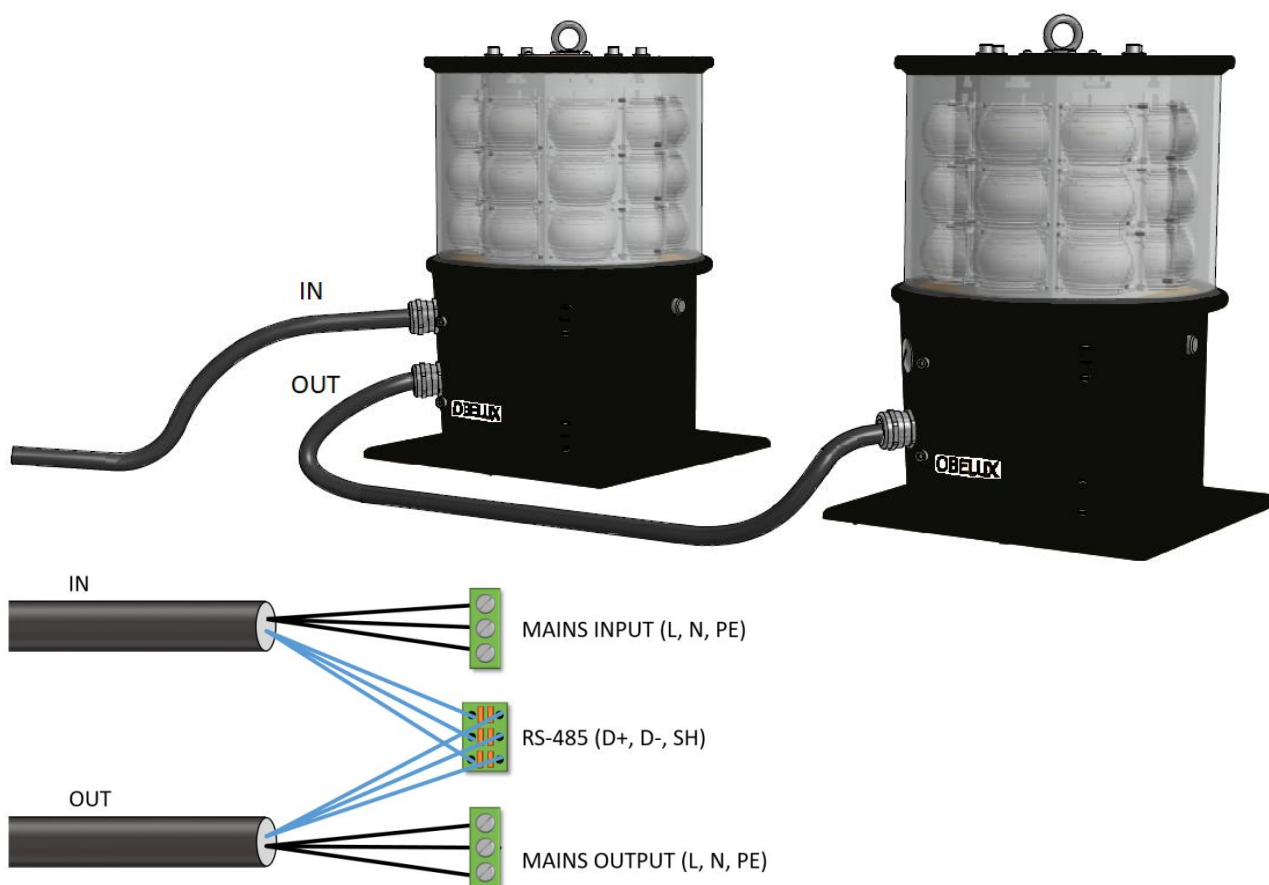


Figure 6: Distributing power and data to next light

Make sure that all unused glands or gland holes are sealed. There are two cable glands on the device. Follow the illustration below to achieve desired EMC protection with the EMC glands:

Cable gland M25 for 11-16 mm cable diameter



Please follow these instructions when routing cable via a cable gland:

1. Partially expose the braided screen by removing the outer sheath of the cable at a length of approx. 10 mm.
2. Insert the cable through the dome nut and the gland body until the contact spring is pressed against the braided screen.
3. Firmly screw on dome nut.

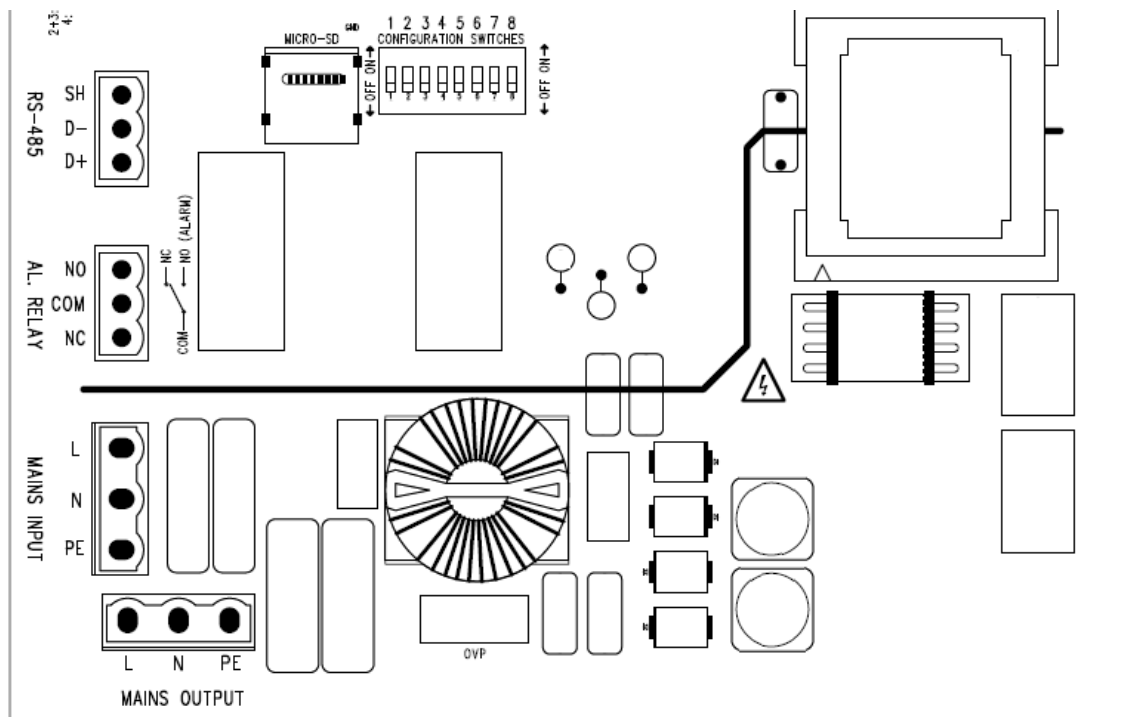


Figure 7: Lights terminals

3.2.1 Mains input

Mark	Description	Information
L	Live terminal	Connect the mains power supply Live (brown) wire into this pole.
N	Neutral terminal	Connect the mains power supply Neutral (blue) wire into this pole.
PE	Protective earth	Connect the protective earth (yellow/green) wire into this pole.

Use single-phase AC supply with Protective Earth. Tighten the connector screws using flat-head (straight) screwdriver.

Conductor cross-section	0.2mm ² - 2.5mm ²
Operating voltage	90-265VAC

3.2.2 Mains output

Mark	Description	Information
L	Live terminal	Connect the mains power supply Live (brown) wire into this pole.
N	Neutral terminal	Connect the mains power supply Neutral (blue) wire into this pole.
PE	Protective earth	Connect the protective earth (yellow/green) wire into this pole.

This terminal is used to distribute power from the light to the next light. Tighten the connector screws using flat-head (straight) screwdriver.

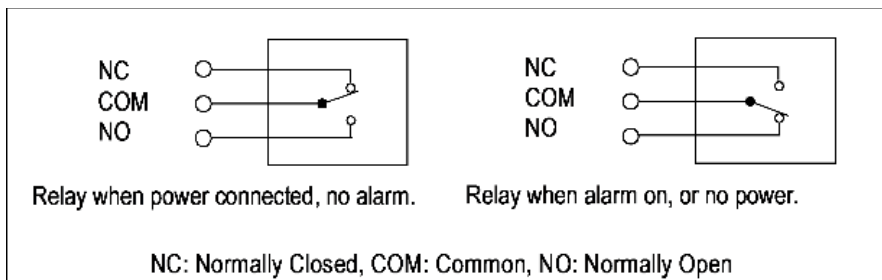
Conductor cross-section	0.2mm ² - 2.5mm ²
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3.2.3 Alarm Relay Output

Mark	Description	Information
NO	Normally Open	In alarm, connected with COM
COM	Common	Common relay contact
NC	Normally Connected	During normal operations, connected with COM

Unused alarm relay connectors can be left floating i.e. no wiring there is required. Push-in spring connection.

Conductor cross-section 0.2mm² - 2.5mm²



Alarm relay operation

3.2.4 RS-485 input

Mark	Description	Information
D+	Data +	RS-485 non-inverting pin
D-	Data -	RS-485 inverting pin
SH	Shield	Shield

The RS-485 network (Modbus) input. Push-in spring connection.

Conductor cross-section 0.2mm² - 2.5mm²

4 OPERATION

Open the two screws that secure the service access door to the chassis using a 5mm hex key. Using the DIP switches visible and accessible via service access opening, configure the desired parameters into the light. DIP switches are numbered 1-8, the lowest number (1) being on the leftmost edge of the red/white DIP switch block looked from service access door. Embedded software in the obstruction light reads configuration switches regularly. Configuration change becomes effective within few seconds.

The light can be configured between two different operating modes. Light reset is needed when changing between the modes.

Stand-alone mode: In this mode, the light operation is configured with DIP switches. No additional controllers are needed.

Modbus mode: In this mode, the light is being controlled with an additional Obelux controller.

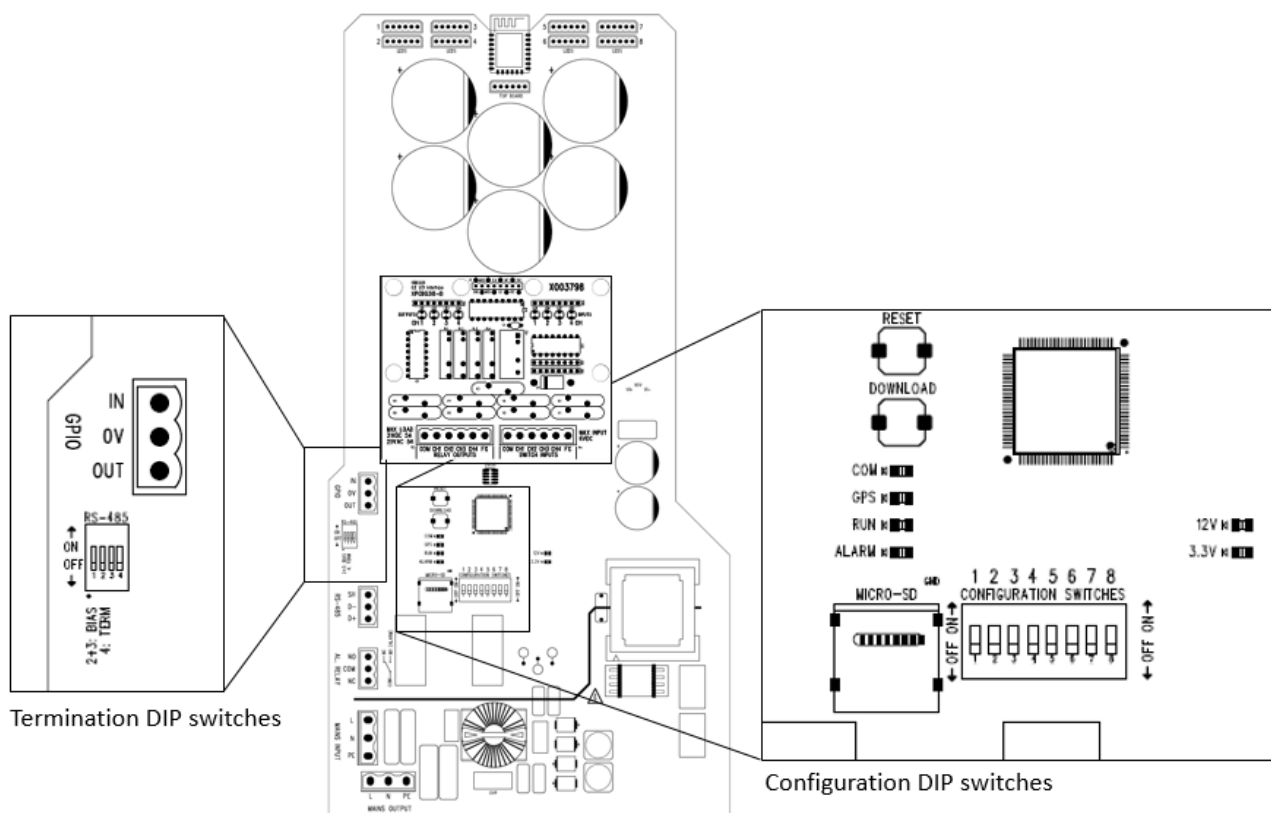


Figure 8: Location of the DIP switches

4.1 Stand-alone mode

In stand-alone operation, the light is configured with the DIP switches. No additional controllers are needed. Light head will use its internal photocell to determine intensity based on ambient lighting. Lights will synchronize their flashing with the built-in GPS module. After light start-up, it will take some time for the light head to acquire a GPS lock.

DIP switches 1, 2 and 3 control the dimming. (External I/O card not in use.)

DIP switch			Dimming
1	2	3	
off	off	off	Manual operation (control by Relay signal)
off	off	on	100% intensity (no dimming)
off	on	off	10% intensity
off	on	on	3% intensity
on	off	off	Auto dimming

Turn off DIP switch 8 for stand-alone operation.

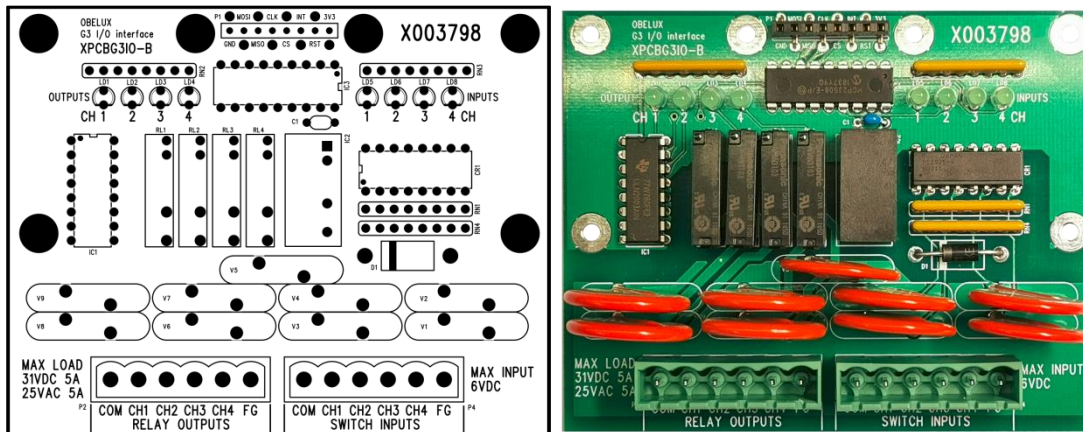
DIP switch	Operating mode
8	
off	Stand-alone *
on	Modbus

RS-485 bus should be terminated with on-board 120 ohm resistors on both ends of this communications bus. Turn on DIP switch 4 from the termination DIP switches.

DIP switch				Reserved
4	5	6	7	

* Factory default

4.2 I/O card and Control Relays



I/O card XG3IO-B

I/O Interface card provides input/output (I/O) functionality for Obelux lights.

The card has on-board LEDs indicate active inputs/outputs.

5000VAC isolated inputs and outputs.

Software configurable operation.

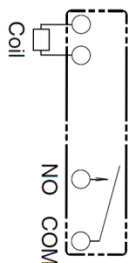
4 switch inputs

- 5V_{DC}, 10mA pull-ups
- Can be used e.g. with open collector outputs, switches, rotary switches or relays
- Over-voltage protection (OVP)

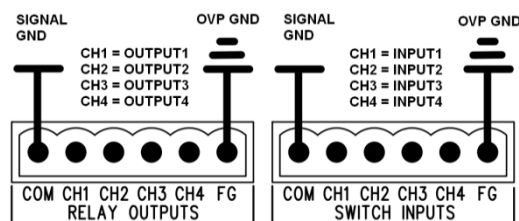
4 relay outputs, NO, dry contact

- Ratings (max load): 31V_{DC} / 5A, 25V_{AC} / 5A
- Normally open (NO) at power off
- Over-voltage protection (OVP)

Inputs and outputs share ground via functional ground (FG) and COM.



Relay operation when powered off.



Connector pin functions.

Control by Relay Signal

DIP switches must be OFF when the I/O card is in use. (DIP switches [1-3] = OFF)

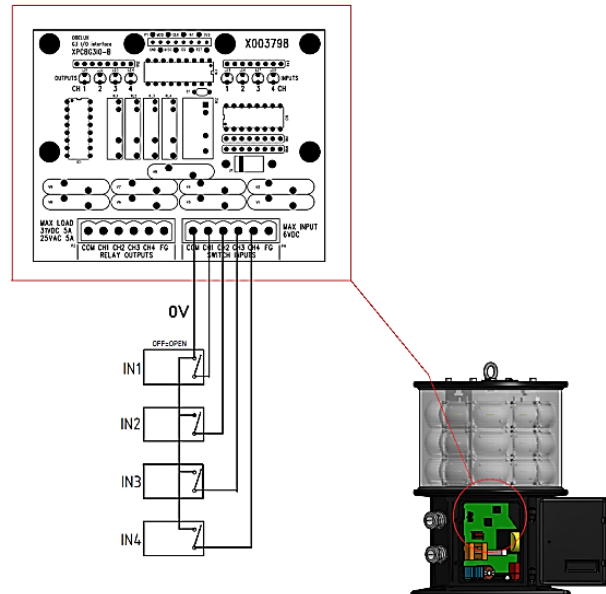
Relay switch input table

Mode	IN1	IN2	IN3	IN4
Light OFF	0	0	0	0
100%	-	-	-	1
10%	-	-	1	0
3%	-	1	0	0
Auto dimming	1	0	0	0

1 = on
0 = off
off=open (=indicator LED is ON)

Auto dimming mode

3% = Night (<50lx)
10% = Twilight (50 - 600lx)
100% = Day (>600lx)



Location of control relays

4.3 Heater operation

All models have a small integrated 5.5W heater element on the main PCB. The heater starts working when the light internal temperature drops below 10°C. Heater reaches 100% operation when temperature drops below 5°C. Heater stops working after the temperature rises above 10°C.

4.4 Causes for ALARM

The following events can cause an ALARM:

- Internal power failure
- Light source failure, including decreased intensity level below rated level of light
- Loss of GPS synchronization signal or GPS module failure
- Incorrect photocell operation

The ALARM led will turn on and ALARM relay will activate.

4.5 Onboard LEDs

Status indication LEDs are located on the controller board. Some of the status indicators have three operating states (off, lit and blinking).

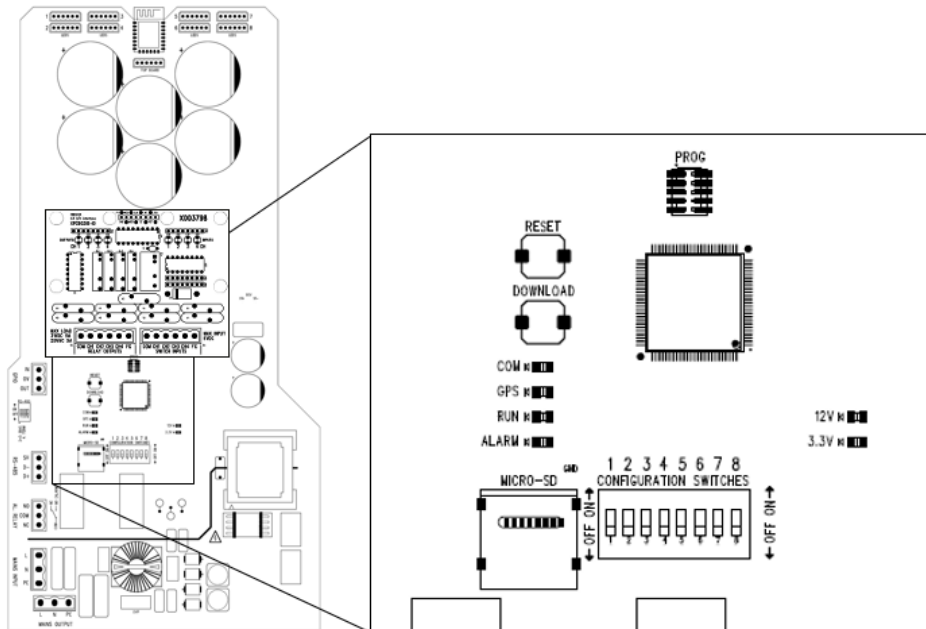


Figure 9: Location of the status LEDs

The light has five status LEDs on the controller board. These status LEDs are visible only when service access hatch is open.

LED	Description
3.3V	Internal operating voltage (GREEN) LED OFF: Power off LED ON: Power on
12V	Internal operating voltage (GREEN) LED OFF: Power off LED ON: Power on
COM	Communication (GREEN) LED OFF: Waiting for external signals LED FLASHING: Master-slave communications occurring on the network
GPS	GPS fix (GREEN) LED OFF: No GPS fix LED FLASHING: Light GPS module has fix on GPS place and time. Light is not yet fully synchronized. LED ON: Light GPS module has fully resolved the UTC time. It may take several minutes for the GPS module to receive the necessary data.
RUN	Synchronization (GREEN) LED OFF: All outputs are off LED ON: At least one output is active. Led is flashing at same time and frequency as the aviation light.
ALARM	Alarm indicator (RED) LED OFF: Normal operation, no alarms LED ON: Active alarm condition

4.6 Troubleshooting

The light doesn't start

- No power (check that the 3.3V status LED is illuminated)
- Incorrect configuration (check DIP switches, make sure Test mode is turned off)
- Loose wires (check that all wires are properly seated in terminal block connectors)
- Do not exceed maximum operating voltage. Mains power supply input is protected with overvoltage protection circuit that is tuned to stated operating voltage range.

No Modbus data connection to Obelux controller

- Check DIP settings. Check that light has a correct Modbus address and that there are no conflicting addresses. Make sure light is configured to Modbus mode (DIP switch 8).
- Too many RS-485 termination resistors (120ohm) on the same RS-485 communication bus. Only the last light on the bus should have the termination resistor in use.
- Check Modbus data wiring

Light does not change modes between day, twilight and night

- Check that the photocell has an uninterrupted view of the sky
- Check that there are no external light sources that interfere with the photocell
- Photocell is sampled once in a minute and read value are averaged to avoid sudden state changes. Unless test mode is enabled, it takes approx. three (3) minutes to change system state between day, twilight and night.

Light does not flash in sync

- GPS antenna is mounted on top of obstruction light. Antenna needs non-blocked view to GPS satellites in orbit. After start-up, GPS receiver may take up to 30min to obtain correct time data from GPS satellites. This operation requires data from several GPS satellites.

4.7 Spare parts

Part code	Description
SSAL20G3PSU	Main board for MID-light
GC-MID17	Glass Cover with gaskets for MID-light