

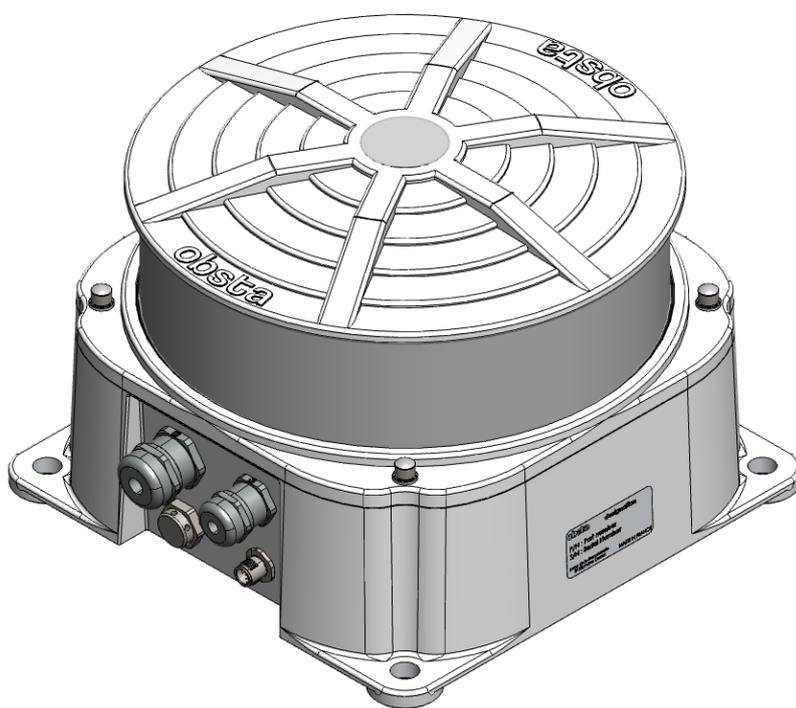


## USER MANUAL

Dual colors medium intensity systems

OFD-RW-048 // 114792-048

OFD-RW-240 // 114792-240



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## 1. Product name and part number

Description	Part number (P/N)	Power supply	QR code
OFD-RW-048	114792-048	48 Vdc	
OFD-RW-240	114792-240	110-240 Vac	

## 2. Caution



- Do not proceed with any maintenance job when the product is under operation.
- Power supply must be shut down when opening the flash-head or the cabinet.
- Installation must be performed only by an electrically skilled operator and National electrical installation rules must be respected.
- Always wear appropriate Personal Protective Equipment (PPE) when installing, maintaining or servicing the system.
- Any installation or maintenance operation performed at height must be carried out in strict compliance with fall-protection procedures.
- Do not look directly at the projector while it is in operation: Led projectors produce brilliant flashes of lights which can result in temporary or permanent eye damage.
- OBSTA products may be affected by ESD, use state of the art precaution before manipulation.
- Unless otherwise specified, all cables must be shielded, and the shielding must be connected to ground.
- All cables connected to PCBs and terminal blocks must be equipped with a cable connector to prevent false contacts when connecting devices.



### 3. Warranty

OBSTA warrants the equipment described in the instruction manual and sold to purchasers to be free from defects in material and workmanship at the time of shipment. OBSTA's liability under this warranty being limited to repairing or replacing, at OBSTA's option, items which are returned to it prepaid within twenty-four (24) months from shipment to the original Purchaser, or twelve months from commissioning, and found, to OBSTA's satisfaction, to have been defective. In no event shall OBSTA be liable for consequential damages. NO PRODUCT IS WARRANTED AS BEING FIT FOR A PARTICULAR PURPOSE AND THERE IS NO WARRANTY OF MERCHANTABILITY.

This warranty applies only if: (I) the items are used solely under the operating conditions and in the manner recommended in OBSTA's instruction manual, specifications, or other literature; (II) the items have not been misused or abused in any manner or repairs attempted thereon; (III) written notice of the failure within the warranty period is forwarded to OBSTA and the directions received for properly identifying items returned under warranty are followed; and (IV) such return notice authorizes OBSTA to examine and disassemble returned products to the extent OBSTA deems necessary to ascertain the cause of failure. The warranties stated herein are exclusive.

THERE ARE NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, BEYOND THOSE SET FORTH HEREIN, and OBSTA does not assume, nor does OBSTA authorize anyone else to assume for it, any other obligation or liability in connection with the sale or use of said products. OBSTA's liability on any claim of any kind, including negligence, for loss or damages arising out of or connected with the manufacture, sale, delivery, repair or use of any equipment or services provided by OBSTA shall in no case exceed the price allocable to the item or service or part thereof which gives rise to the claim.

The integrity and reliability of OBSTA aviation obstruction lighting systems is dependent on the use of OBSTA parts and components. To ensure the optimum performance and reliability of your OBSTA system, it is strongly advised that only components and modules manufactured by OBSTA be used.

## 4. Introduction

### 4.1. General information

This manual provides information about the installation, operation and maintenance of the OFD Dual color intensity obstruction lighting systems manufactured by OBSTA. The lighting systems described in this manual are medium intensity type A, B, C and FAA type L-864 and L-865 obstruction lights.

### 4.2. General description

The OFD OBSTA aerial beacon is a medium-intensity, dual-color-lead obstacle light that complies with Type A and Type B requirements. It provides white flashing light during the day and red flashing light at night, and is designed to mark aerial obstacles such as pylons, wind turbines, buildings, or tall infrastructure.

The beacon operates autonomously thanks to its integrated power supply (voltage depending on the model). It incorporates all control, monitoring, and alarm generation functions, which are available on a connection terminal block for transfer to an external system.

The flash head consists of six optical lenses, each equipped with a printed circuit board incorporating:

- Eight white LEDs
- 3 red LEDs
- 1 infrared LED

The lamp support housing contains a control board, which converts the power supply, controls the current of the various LED circuits, and manages advanced functions (synchronization, GPS, alarms).

The flash head is mechanically secured using 4 M6 screws. The seal between the flash head and the housing is provided by a 70 Shore O-ring, ensuring an IP66 protection rating. It is essential to ensure that this seal is correctly positioned during any installation or maintenance work.

The beacon can be integrated into a larger beaconing architecture by adding a control box and/or battery box downstream, depending on the site's requirements.

### 4.3. Operation

All management, monitoring and control functions are handled by the internal control board which controls led power supply, lighting mode selection and synchronization and alarm signal generation.

#### **Settings and operating modes:**

The operator can configure several settings depending on the application and site architecture. The operating scenario is defined by a file transmitted via a USB key and dipswitches (SW2 and SW3). The main modes and functions available are as follows:

- **Master/Slave mode:**  
A beacon configured in master mode generates control and synchronization signals. Beacons configured in slave mode follow these signals to ensure simultaneous, coordinated and perfectly synchronized operation of the entire beacon system.
- **DTN (Day/Twilight/Night) mode:**  
The beacon can operate day and night with automatic switching between day, twilight and night modes, ensuring lighting intensity and color adapted to ambient conditions and regulatory requirements.
- **Top synchro**  
The top synchro signal is used to trigger the flashing of several lights simultaneously, ensuring precise and consistent synchronization across the entire site.
- **Flash duration and frequency**

The light operating parameters can be adjusted, including:

- Fixed or flashing mode
- Night-time only or permanent operation
- Simultaneous or redundant mode operation

The electronic board has an Ethernet socket. This allows status information to be transmitted to an external supervision system.

These settings allow the beacon to be adapted to regulatory requirements and the specific needs of the installation.

### **Monitoring and alarms**

The OFD incorporates a continuous monitoring system for its operating status. Defaults (power supply, led, synchronization) trigger alarms.

An alarm relay is available for status reporting: Sends real-time information on the status of the beacons (NO/NC contact available). An alarm will be triggered when certain conditions are met, depending on the configuration and switches. Free contact (relay 10A 240Vac / 5A 30Vdc max).

Status and default information can also be transmitted to a supervision system via Modbus TCP or CAN network communication interfaces.

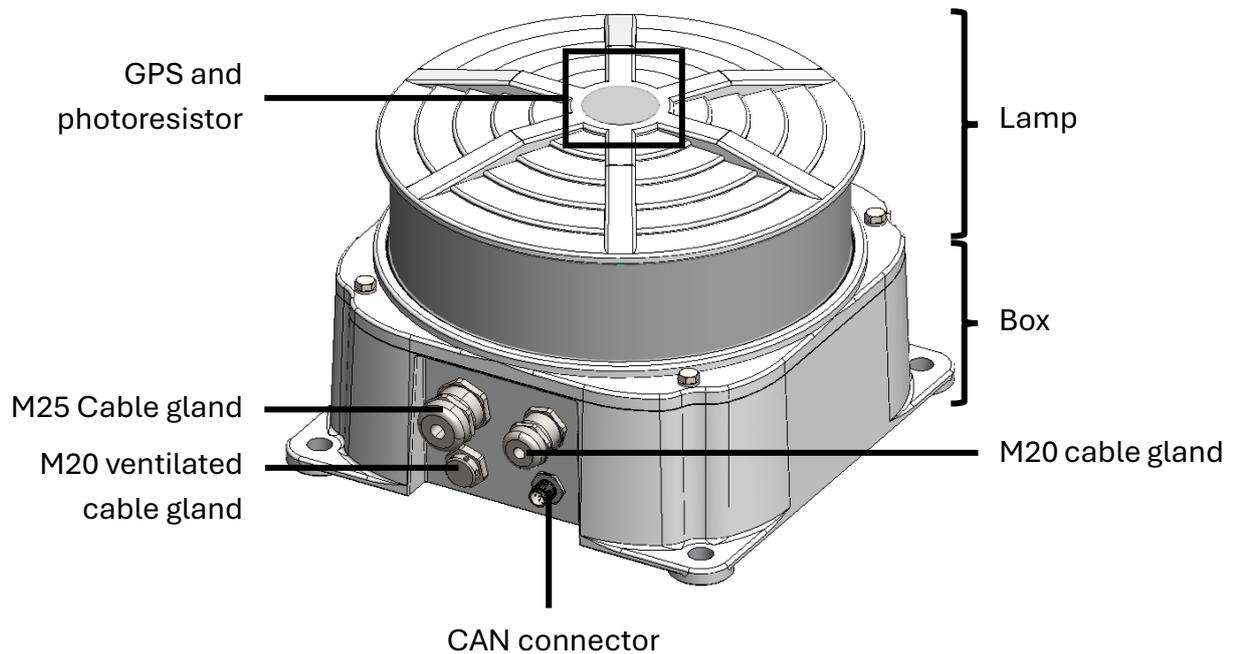
## 5. Installation

### 5.1. Unpacking

Carefully unpack the product and remove any internal packing material. Examine each item for obvious physical damage. Immediately report any claims to the carrier.

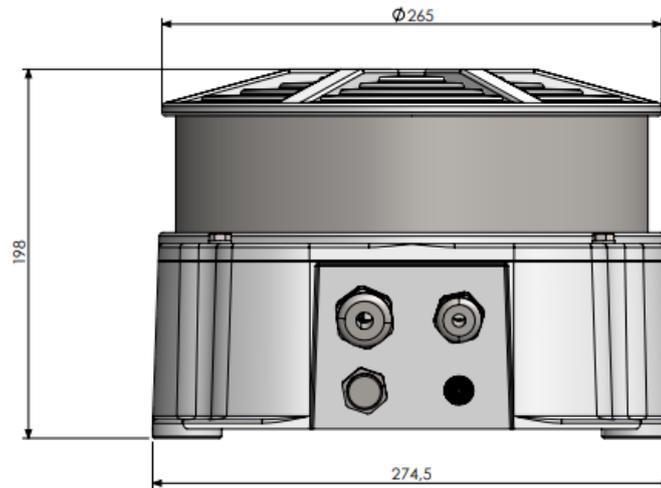
It's strongly recommended to supply the product and verify that it's working properly at ground level before final installation.

### 5.2. Overview

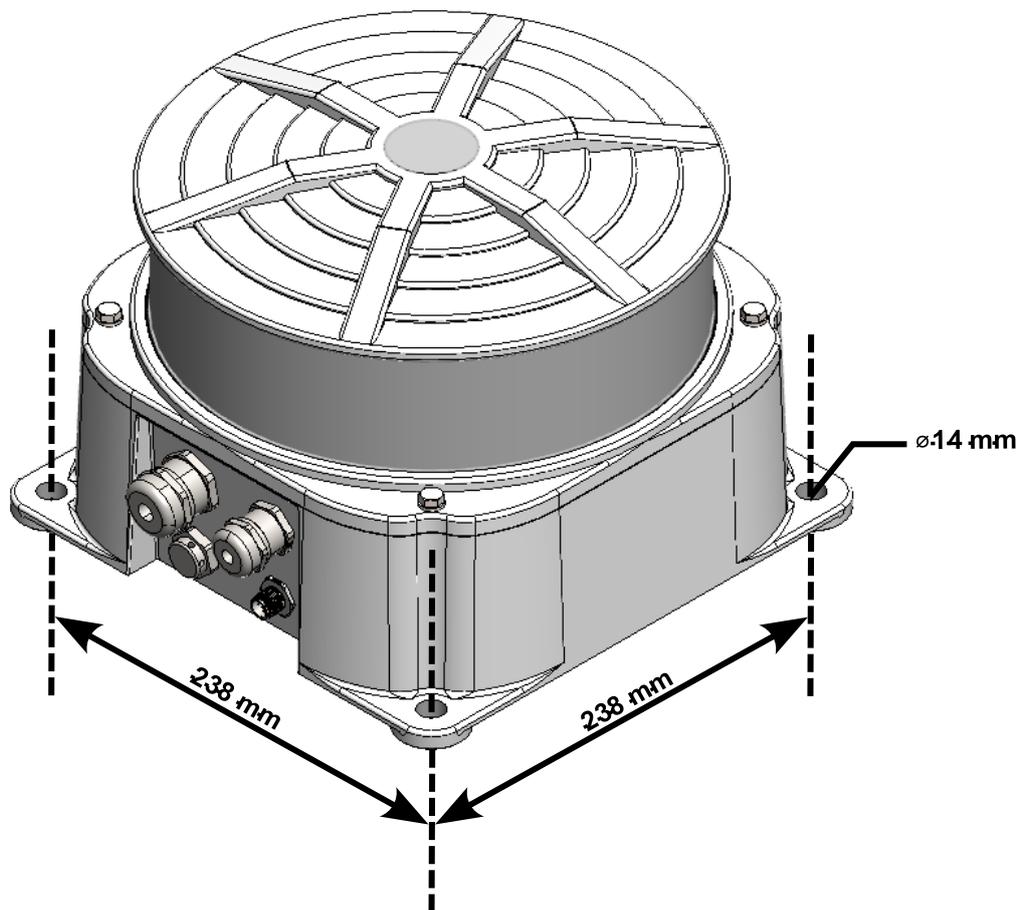


**Remark:** The sensor (GPS and photoresistor) above the OFD must never be obstructed or covered.

### 5.3. Mounting



The light assembly fixture must be mounted perfectly on horizontal to meet the optical specification required for Aircraft Obstruction lights. OBSTA recommends using M12 screws with locknuts and a torque of 60Nm for optimum clamping. OBSTA recommend that the metallic base of the light be connected through a grounding kit to the local grounding of the tower.



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## 6. Wiring

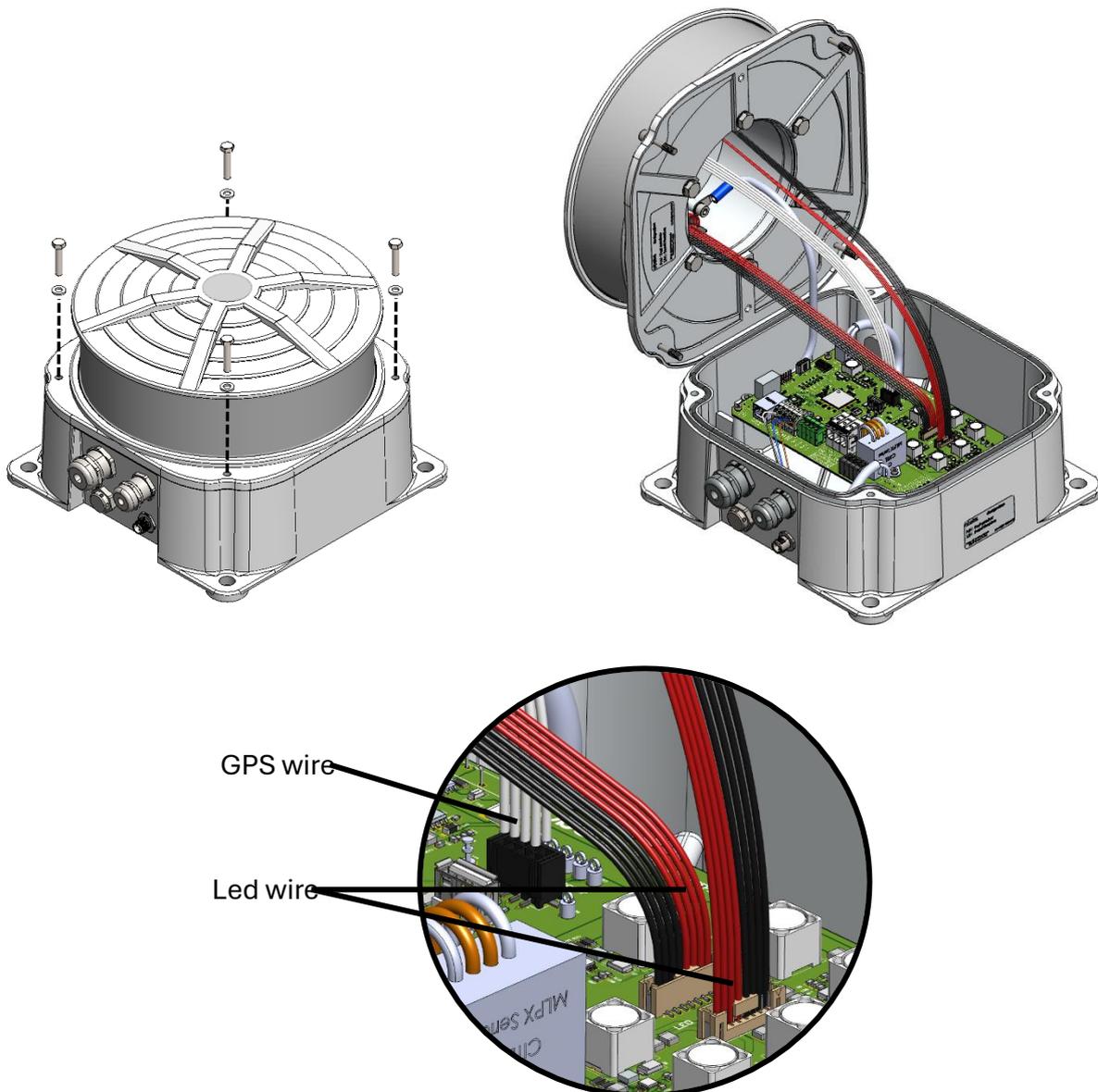
### 6.1. Caution before wiring

- **Power OFF:** Always ensure the main power supply is completely turned off before starting any wiring work.
- **Verify voltage:** Confirm the voltage level of the circuit. Be aware of high-voltage hazards.
- **Use proper PPE:** Wear personal protective equipment (insulated gloves, safety glasses and safety shoes).
- **Secure the work area:** Ensure the area below is cordoned off to prevent injury from falling tools or components.
- **Check equipment ratings:** Confirm the product's voltage and current ratings match the installation circuit.
- **Inspect components:** Examine all parts (wires, connectors, terminals) for damage before wiring.
- **Proper tools:** Use insulated tools appropriate for electrical work.
- **Follow wiring diagram:** Refer to the OBSAT's schematic to ensure correct connections.
- **Grounding:** verify proper grounding/earthing for all metal parts and enclosures.
- **Secure wiring:** Fasten cable properly to prevent strain, chafing, or accidental disconnection.
- **Verify before powering:** Double check all connections before restoring power.
- **Shielded cable:** Cables must be shielded when used in electromagnetic fields.
- **Position:** The lamps shall be installed as close as possible from the command box from it using a 2x1.5mm<sup>2</sup> cable.
- **Number of lamps:** If more than 1 lamp is connected, all lamps must be wire in parallel.
- **Polarities:** The polarities must be correctly positioned on the DC power. If reversed, the printed circuit board may be seriously damaged.
- **Configuration:** Do not forget to set the dipswitches as required by the warning lights: Unless specified, dipswitch settings configurations are factory preset.

## 6.2. Card access

Unscrew the four M6x30 screws located at the four corners of the “lamp” block. Be very careful when opening the product. The interior contains wiring connecting the electronic board to the light head. Do not pull abruptly on the parts you are separating to avoid damaging these sensitive connections. Handle with care to ensure the product functions properly.

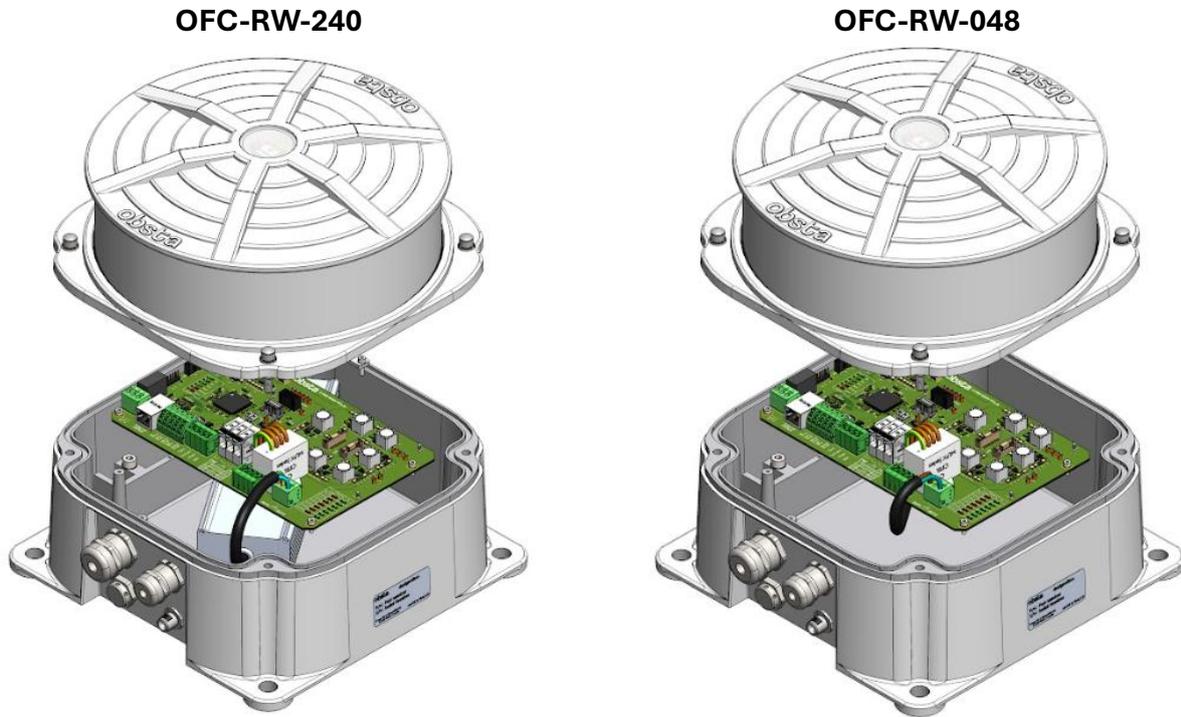
Before closing the flash head: Check the position of the O-ring in the light body before closing the flash-head. Check tightening of the four screws that close the flash-head with a torque spanner (10Nm). Incorrect tightening or positioning of the gasket can alter the tightness and cause irreversible damage to the OFD. Use a spirit level to check the light is perfectly horizontal.



### 6.3. Overview

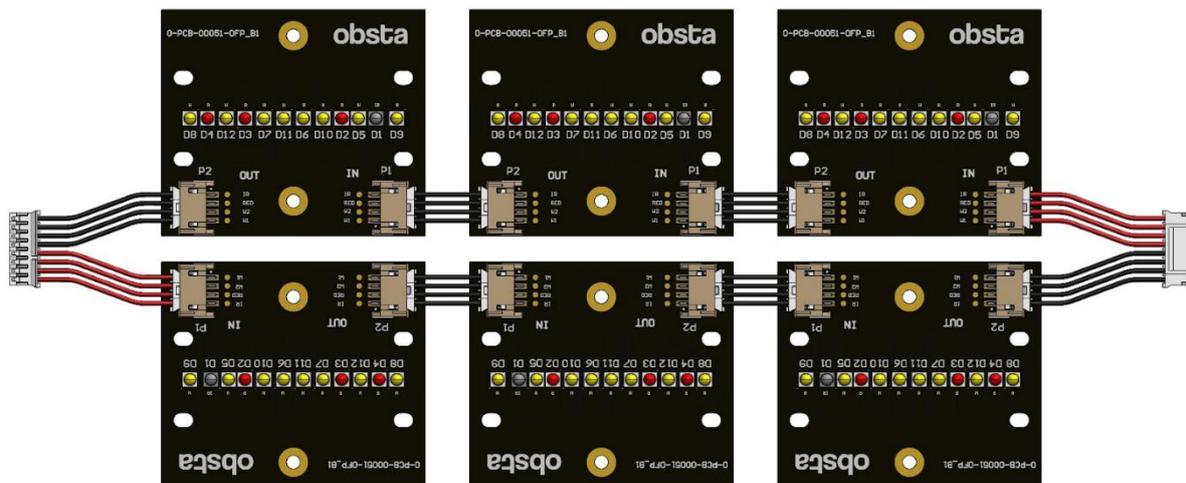
#### 6.3.1. OFD 048 and 240

The OFD 240Vac is equipped with a power supply directly integrated and connected into the product casing.



#### 6.3.2. PCB led (lamp)

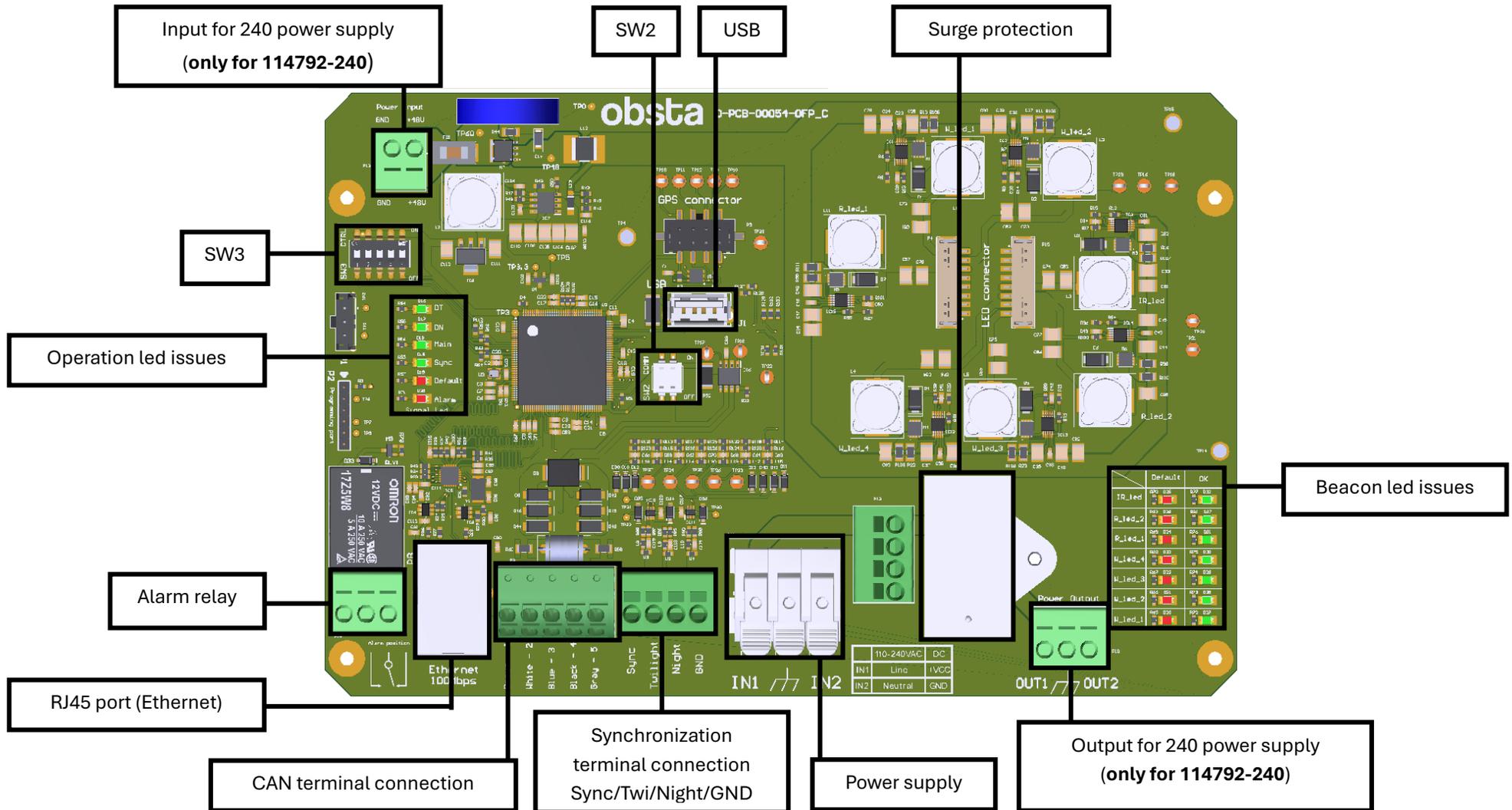
Inside the flash-head, each optic contains a PCB with a circuit of 8 white, 3 red and 1 infrared led.



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6.3.3. Main card (box)



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#### 6.4. Alarm relay

This connector is used as a relay to send status information from the beacon to an external control system. The use of this terminal block must be specified when configuring the OFD.

#### 6.5. Synchronization terminal connection

Input terminal block for receiving 48Vdc control and external synchronization signals. It enables the beacon to synchronize flashes and switch between day/twilight/night modes between beacons. The use of this terminal block must be specified when configuring the OFD.

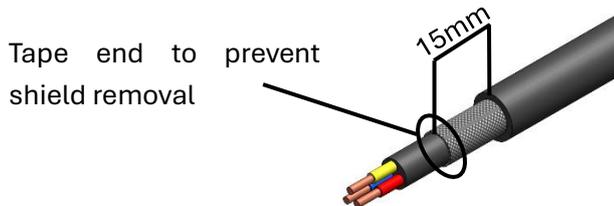
#### 6.6. CAN terminal connection

Terminal block for integrating the tag into a network via the CAN bus. It enables real-time data exchange between the tag and a monitoring system. The use of this terminal block must be specified when configuring the OFD.

### 6.7. Cable gland installation

**As a reminder, all shielded cables must be earthed at both ends. It is the installer's responsibility to check that OBSTA cabinets and lamps are correctly wired.**

- Strip excess cable length to expose shielding.
- Leave 15mm of shielding, strip the rest.



- Thread the cable through the cable gland (the ring is loosened but not removed) so that the shield is in contact with the gland springs.
- The gasket must be correctly positioned flat and in its housing for optimum sealing.



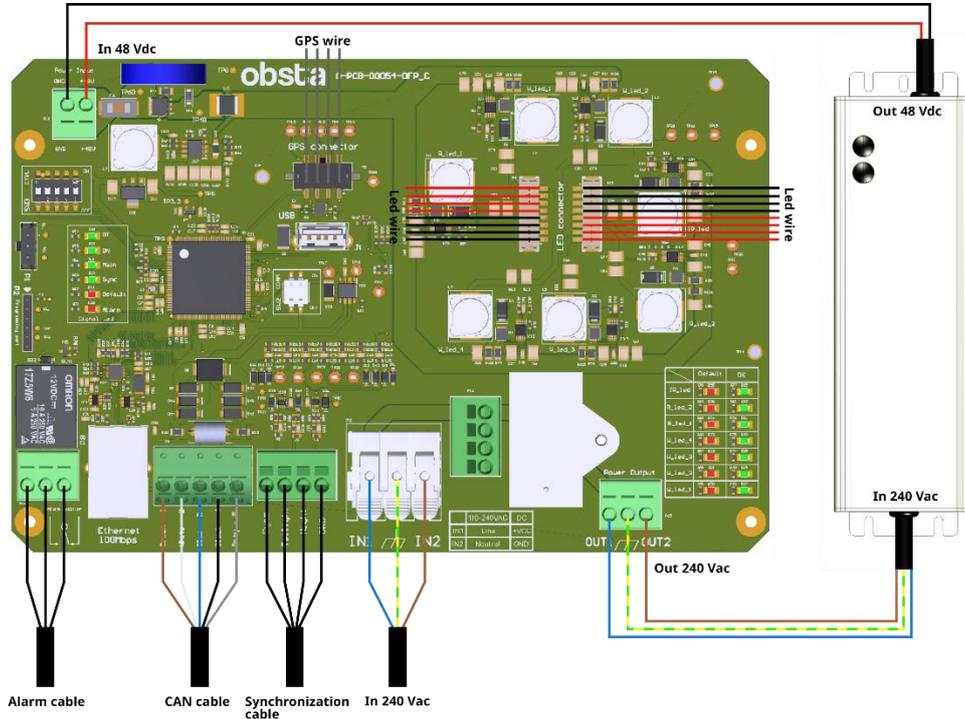
- Tighten the gland ring with the appropriate wrench.
- Once the cable has been clamped in the cable gland, cut and strip the wires to the length required to connect the terminal blocks (don't forget to fit cable ferrules before connection).

CEM	Cable diam min (mm)	Cable diam max (mm)	Pressure nut wrench	Locknut wrench
M20	7	13	24	24
M25	9	17	29	29

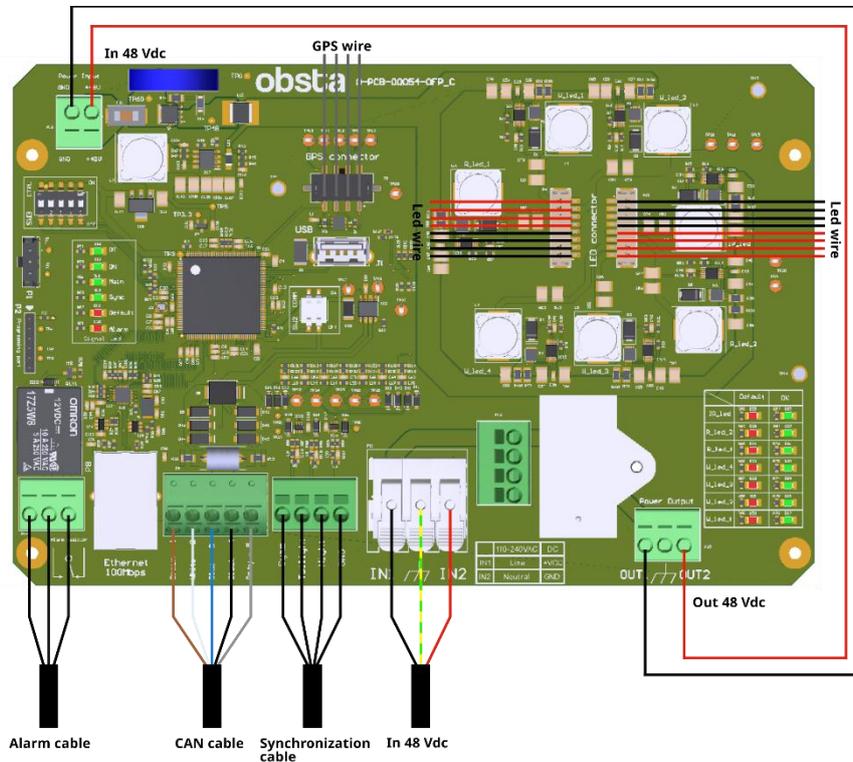
6.8. Typical wiring

The following typical wiring are provided for illustrative purposes only.

**OFD 240 Vac**



**OFD 48Vdc**



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## 7. Startup and configuration

### 7.1. Power-up

**Before turning on the power, ensure that all electrical connections are properly made and that the supply voltage matches the product specifications. Check that the wiring is secure and that there are no bare wires or conductive elements that could cause a short circuit.**

### 7.2. Configuration

**All switches are factory set to use NAVILITE in “fixed” mode (no flashing for RED or IR) or according to user requirements. Any change in the position of the dip switches must be made with the agreement of OBSTA.**

#### 7.2.1. SW3

SW3 setting					
	1	2	3	4	5
<b>ON (I)</b>	Nominal	Master	Override	Override	-
<b>OFF (0)</b>	Reset	Slave	Override	Override	-

Override setting		
SW3.3	SW3.4	
0	0	Do not force mode
0	I	Force night light mode
I	0	Force day light mode
I	I	Force twilight light mode

#### 7.2.2. SW2

SW2 setting		
	1	2
<b>ON (I)</b>	-	End of line resistor activated
<b>OFF (0)</b>	-	End of line resistor disactivated

**End of line resistor:** for BUS communication with smart controllers, end of line resistor is required for the last beacon connected. The last beacon is defined by the one with the longest communication distance from the controller.

## 7.3. USB

The USB port is the device's maintenance and configuration interface. It is mainly used to configure the beacon, update the system and extract logs.

### 7.3.1. Technical requirements

To ensure compatibility with the OFD, USB storage devices must meet the following criteria:

- **Hardware/File System:** The USB drive must be provided by OBSTA.
- If not, the device must be formatted in FAT32.
- **Device state:** The USB drive must be free of any pre-existing data.
- **File Naming:** File names are case-sensitive. Any variation in naming may cause the operation to fail.
- **Security responsibility:** The use of unsecured devices is the sole responsibility of the user

### 7.3.2. Implementation procedure

1. If the USB drive is not provided by OBSTA, format and erase the USB drive using FAT32
2. Insert the USB drive into the appropriate port.
3. Power on the device (lamp)
4. Wait 2 minutes for stabilization and detection
5. The beacon should display the following led sequences, depending on the operation in progress:
  - a. Diagnostic and incident recovery: fast flashing red led
  - b. Loading settings and network configuration: alternating red/green led flashing
  - c. Software update: fast flashing green led
6. If an error code appears instead of the led sequences, refer to section "USB error".
7. Disconnect the power supply to the beacon
8. Wait 2 minutes before powering it again
9. Reconnect power to the beacon
10. The device should be operational in 2 minutes

## 7.4. USB interface function (configuration)

- **Loading parameters:** This function allows importing specific configurations into the OFD card memory.

After creating a `param.cfg` file, its content on the USB stick must be structured as follow:

```
N # DTN MODE SOURCE ***** 1=Photosensor; 2=DT/DN input; 3=GPS; 4=CAN bus
N # TOP SYNCHRO SOURCE ***** 1=Internal clock; 2=SYNC input; 3=GPS; 4=CAN bus
N # CONFIG NUMBER***** an existing config number
N # RELAY USED***** 0=not used; 1=used
N # TOP SYNCHRO SHIFT ***** 0=second 0; 1=1/13 of period; 2=3/13 of period; 3=second1
N # FAA ENABLED ***** 0=not enabled; 1=enabled
```

Each line represents a configurable parameter. Replace the character “N” with the digit corresponding to the chosen configuration.

Example: If a photosensor is used for Day/Twilight/Night detection, replace N with 1 on the corresponding line.

After modifying the parameters, follow the procedure from step 3 to finalize the operation. The led sequence confirming successful file reception is alternating red/green led flashing.

**Configuration number** (third line of the `param.cfg` file):

Enter the configuration number (N° config.) in the file according to the intended use of the OFD.

N° Config	Parameter	Norm	Type
0	MI A/B (W/IR) 20FPM	ICAO	A/B
1	MI A/B (W/R) 20 FPM	ICAO	A/B
2	MI (IR/R-IR) 30 FPM	ICAO	CUS/B
3	MI A/B (W/IR) 40 FPM	ICAO	A/B
4	MI A/A (W/W) 20 FPM	ICAO	A/A
5	MI A/A (W/W) 40 FPM	ICAO	A/A
6	MI A (W) 20FPM	ICAO	A
7	MI A (W) 40 FPM	ICAO	A
8	MI A/C (W/IR) 20 FPM	ICAO	A/C
9	MI A/C (W/IR) 20FPM	ICAO	A/C
10	MA A/B (W/IR) 20 FPM-1000ms RED	ICAO	A/B
11	MI A/B (W/IR) 30FPM – 666ms RED	ICAO	A/B
12	MI A/B (W/IR) 30 FPM	ICAO	A/B

- **User data extraction:** this function allows the procedure from step 3 to finalize the operation. The led sequence confirming successful file reception is alternating red/green led flashing.  
In case of a major system failure or during maintenance, this feature allows event logs to be extracted to identify the source of the malfunction.  
Once the empty `mi_log.bin` file is created, insert the USB drive into the card's port (fast flashing red LED).
- **Network configuration:** This allows the registration of a TCP/IP address on the card to enable remote management and monitoring.

After adding a file named `ip.cfg`, include the subnet mask, OFD IP address and gateway IP address:

X.X.X.X	→	IP address
Y.Y.Y.Y	→	Subnet Mask
Z.Z.Z.Z	→	Gateway IP Adress

- **Software update:** Reserved for qualified personnel, the OFD beacon can be updated via the USB port.

Place the encrypted binary file and rename it `MIdual.bin`, placing it at the root of the USB drive. Insert the USB drive into the OFD card. After the USB is read and removed from the OFD card (fast flashing green led), the system initiates a reboot with the new software version.

***Access to these files is restricted and requires prior authorization from OBSTA.*** This procedure must be performed by qualified personnel due to the encrypted nature of the data. Strict adherence to these procedures ensures optimal data integrity and reliable device operation.

## 7.5. Troubleshoot - malfunction

Two led circuits are present to indicate the status of the system (led operation issues and beacon led issues). If a default is found, those leds are activated and allowed to identify a permanent default to the operator. The alarm relay is also activated to indicate remotely the status of the light.

### 7.5.1. Operation issues

Led	Bootloader	Init	Normal operation
<b>DT</b>	OFF	Continue	If DTN mode is set to DTN_NIGHT or DTN_TWILIGHT If mode is forced: fast blinking else continuous. Others turned off
<b>DN</b>	OFF	Continue	If DTN mode is set to DTN_NIGHT: If mode is forced: fast blinking else continuous. Others turned off
<b>Main</b>	Display error code otherwise OFF	Continue	If USB key is plugged: If TCP/IP config and / or USB param has just been read, alternate with Default led for 12 times, Then if the program buffer has been filled (update), it will blink fast. Else turned-on during flashes
<b>Sync</b>	OFF	Continue	Turn on during 100ms upon each rising edge of TOP_SYNC (whatever the signal is incoming or outgoing). Others turned off
<b>Default</b>	Continue	Continue	If USB key is plugged: If a default has been detected during firmware update or log event writing or TCP/IP config reading, associated signal sequence If no default and log event has been retrieved, fast blinking. Upon default detection, associated signal sequence Else turned off
<b>Alarm</b>	OFF	OFF	Turned on if relay is powered off (lamp issues)

### 7.5.2. "Main" led sequence

	Bootloader error	Action after error display
— <b>1 long</b>	After startup, flash memory operations are not possible (memory locked or in error)	Reset microcontroller
· <b>1 short</b>	Firmware is corrupted: size or checksum verification failed	Start program
· — <b>1 short and 1 long</b>	After flash sectors unlocking, flash operations are not possible (memory locked or in error)	Start program
· — — <b>1 short and 2 long</b>	Impossible to erase current program version flash sectors	Start program
· · <b>2 short</b>	Error when writing a new program to flash memory	Reset microcontroller
· · · <b>3 short</b>	Unexpected error	Undefined

7.5.3. USB error

Upon USB firmware update or log retrieval, problems may occur and shall be signaled through Default led while USB key is still plugged (in this order of priority):

Error condition	Default led sequence
Error when mounting USB file system	— · — 1 long, 1 short and 1 long
The USB key is empty, with no log file, no firmware, no IP config, no param detected.	· 1 short
Error when opening MIDual.bin file	— · 1 long and 1 short
Error when waiting for flash memory write access availability	— · · 1 long and 2 short
Error when reading MIDual.bin file	— · · · 1 long and 3 short
Error when decrypting MIDual.bin file to flash memory	· — 1 short and 1 long
Error when writing MIDual.bin file to flash memory	· · — 2 short and 1 long
Incorrect CRC result (may be consequence of a bad encryption key)	· · · — 3 short and 1 long
Error when encrypting mi_log.bin file	· · 2 short
Error when writing mi_log.bin file	· · · 3 short
Error when writing param.cfg file	· · · · 4 short
Error when unmounting USB file system <i>Exception: this event will be signaled after USB key removal, during a 10 sec delay.</i>	— 1 long
Error when USB parameters are composed of at least one bad value in param.cfg	· · — — 2 short and 2 long
Error when parsing a detected ip.cfg	— · · · 2 long and 2 short
Error when processing USB events: unexpected event.	— — 2 long

**7.5.4. Default**

Default	Condition	Red led signal	Lamp signal
<b>Power supply</b>	Detected if over or under voltage.	..... Short blinking	OFF
<b>Invalid configuration</b>	Means inconsistency in received parameters.	-... 1 long and 3 short	OFF
<b>Light channel error</b>	Number of channels error until default mode for the selected configuration number and for the current light mode.	.. 2 short	-
<b>Light relay error</b>	Number of channels error until activating relay for the selected configuration number and for the current light mode.	. 1 short	-
<b>Slave out of synchronization</b>	Light is configured as slave (SW3.2 is OFF), current configuration sequence is not a continuous flash, and no top synchro signal has been received in the last 10 seconds.	-.. 1 long and 1 short	-
<b>GPS out of synchronization</b>	If GPS is ON, Master is ON and the GPS timing signal is lost for more than 15 minutes.	-... 1 long and 2 short	15 FPM
<b>DTN mode unchanged</b>	The DTN mode did not change and has not been forced since the last 48h.	- 1 long	-
<b>External communication problem</b>	Communication through Ethernet has failure. CAN is activated but "not connected" and the system starts up after more than 30 min	-- 2 long	-
<b>DTN from GPS not available</b>	GPS signal is lost for more than 30 minutes	---. 2 long and 1 short	-

## 8. Maintenance

### 8.1. Annual visit

Test	Frequency	Preventive action	Risk
<b>Aspect (rust, dust...)</b>	Annual	Exterior cleaning Check the condition of the lamp head glass	Malfunction
<b>Clamping</b>	Annual	Checking tightness	Lamp falling Tightness degradation
<b>Wiring</b>	Annual	Visual control Tightening cable glands Tightening PCB wire	Cable damage Poor electrical contact Short circuits
<b>Waterproof</b>	Annual	Lamp visual verification	Water infiltration Short circuit Lamp off
<b>Light performance</b>	Annual	External verification Clean beacon Check lamp default	Poor brightness Lamp in fault mode

### 8.2. Spare part

- Main board **[770347]**
- Power supply 48Vdc **[208222]**
- Surge protection 240Vac **[MLPX1-240L-W]**
- Surge protection 48Vdc **[MLPX1-48DC-W]**
- Flash head **[Contact OBSTA]**

## 9. Technical specifications

### Light output (standard configuration)

Designation	Min	Nominal	Max	Unit
Flash rate	20	30	60	FPM
Beam pattern (horizontally)	-	360	-	°
Beam pattern (Vertically)	3	-	-	°
Day luminosity ± 25%	-	20 000	-	Cd
Twilight luminosity ± 25%	-	20 000	-	Cd
Night luminosity ± 25%	-	20 000	-	Cd
Flash duration day	200		Continuous	ms
Flash duration twilight	200		Continuous	ms
Flash duration night	200		Continuous	ms

### Electrical input for 48 Vdc

Designation	Min	Nominal	Max	Unit
DC power input voltage	43	48	53	Vdc
Max current	-	-	5	A
Average power consumption*	-	-	30	W
Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

\*This value is the minimum ICAO, but it depends on the configuration chosen.

### Electrical input for 120-240 Vac

Designation	Min	Nominal	Max	Unit
AC power input voltage	110	120 / 240	264	Vac
AC frequency	47	50 / 60	63	Hz
Max current	-	-	1	A
DC output voltage for the flash-head	-	48	-	Vdc
Average power consumption*	-	-	30	W
Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

\*This value is the minimum ICAO, but it depends on the configuration chosen.

### Mechanical properties

Designation	Min	Nominal	Max	Unit
Mass of the flash head (240 version)	-	9.3	-	kg
Mass of the flash head (048 version)	-	8.3	-	kg
Max wind force under 320 km/h	-	227	-	N
Box dimension	-	198 x 292.5 x 275	-	mm
Lamp dimension	-	270 x 270 x 105	-	mm

### Operating environment

Designation	Min	Nominal	Max	Unit
Working temperature	-40	20	55	°C
Relative humidity	5	-	95	%
IP class	-	66	-	-