obsta

USER MANUAL

Dual colors medium intensity systems

OFD-RW-048 // 114792-048

OFD-RW-240 // 114792-240

www.obsta.com

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **2** sur **25**
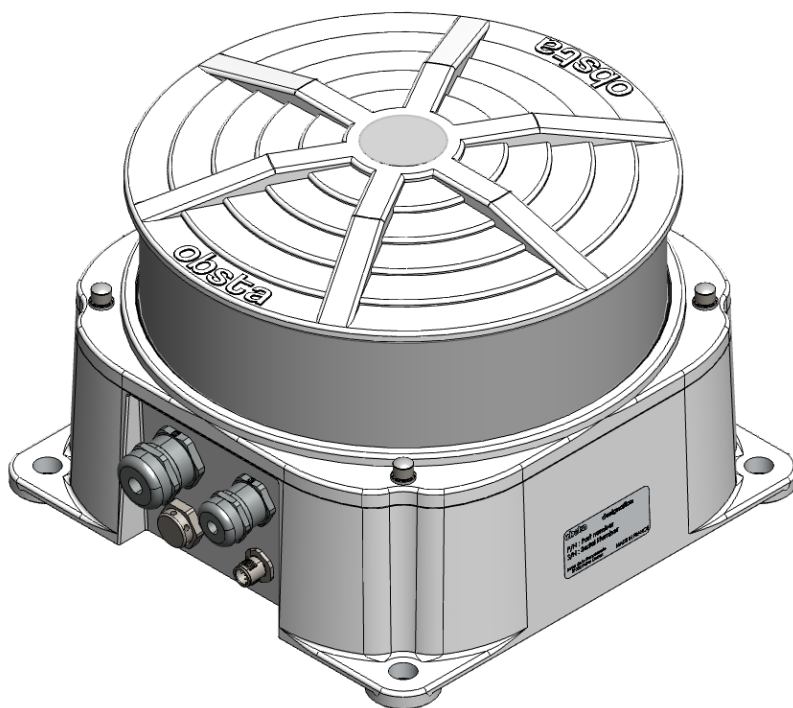
1. Product name and part number

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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **4** sur **25**

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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **5** sur **25**

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 includes:

- The flash head (lamp) comprises 6 lenses, each equipped with a PCB comprising 8 white, 3 red and 1 infrared LED.
- The box contains the PCB (command card) that controls the light output. It is very important to ensure the O-ring is placed correctly while closing the flash-head.
- Power supply (only for OFD-RW-240).
- The command card inside the light ensures the conversion of the power supply input, the control of the current for the 6 led circuits inside the flash-head. Setting of the light (master/slave), synchronization, GPS and alarm.

The attachment of the flash-head is done with 4 M6 screws. Waterproof is done through a 70-shore O-ring between the flash-head and the box (lamp holder). The OFD is IP66 class.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **6** sur **25**

4.3. Operation

The OFD is an LED medium intensity system manufactured to comply with ICAO annex 14 chapter 6 and Federal Aviation Administration Advisory Circular 150/5345-43J.

The operator can configure several parameters depending on how the beacon is used:

- **Master/Slave mode:** The master generates the control and synchronization signal, and the slaves follow this signal to ensure simultaneous and coordinated operation of the equipment.
- **DTN mode**: The lamp can be used day and night with automatic switching between day, twilight and night (DTN) modes.
- **Top synchro**: Trigger signal used to flash several navigation lights at the same time in a perfectly coordinated manner.
- **Flash duration and flash frequence**: set the operation of the lamps: fixed mode or flashing mode, night only or permanent, redundancy or simultaneous.
- **Alarm relay**: Returns real-time tag status information (NO/NC contact available). Alarm will be set when some conditions are met, depending on the configuration and switches. Free contact (relay 10A 250 Vac / 5A 30Vdc max)
- **Data monitoring via a monitoring system.**

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **7** sur 25

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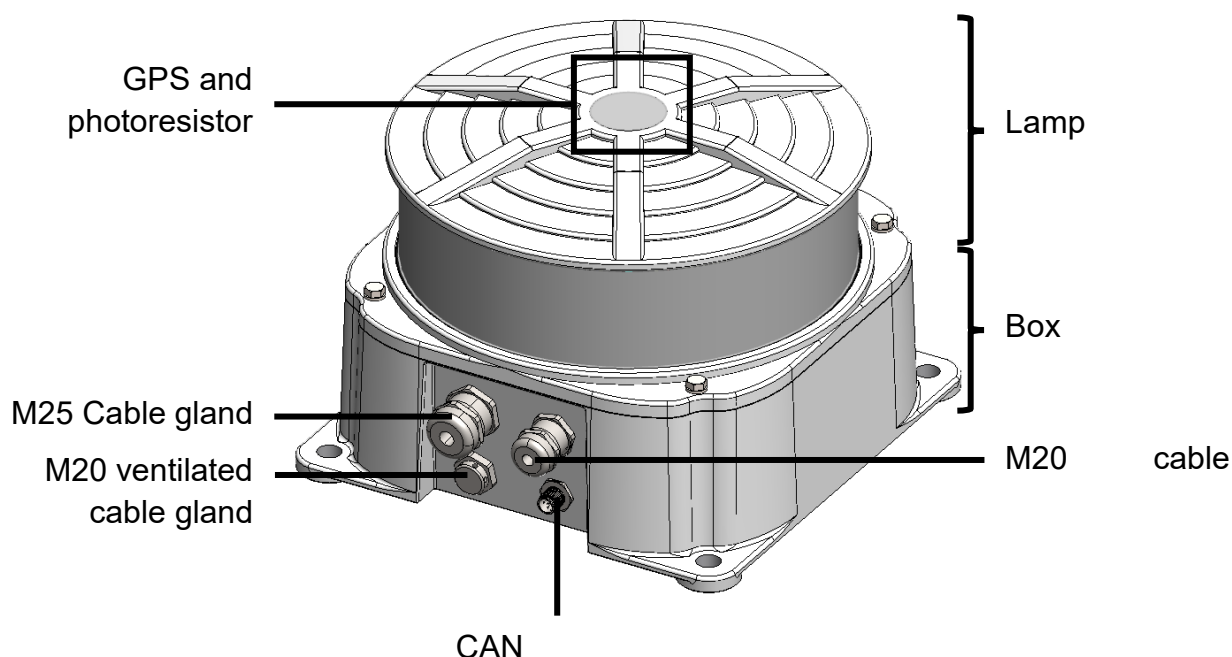
Remark: *The sensor (GPS and photoresistor) above the OFD must never be obstructed or covered*.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **8** sur **25**

5.3.   Mounting
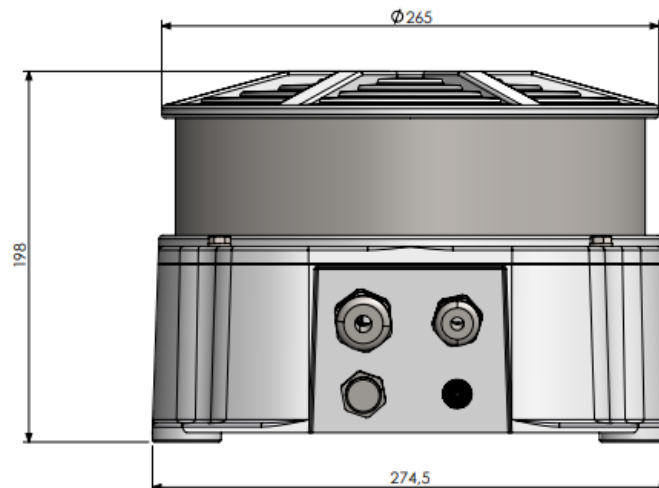
The light assembly fixture must be mounted perfectly on horizontal to meet the optical specification required for Aircraft Obstruction lights. OBSTA recommends using M12 screws with locknuts and a torque of 60Nm for optimum clamping. OBSTA recommend that the metallic base of the light be connected through a grounding kit to the local grounding of the tower.
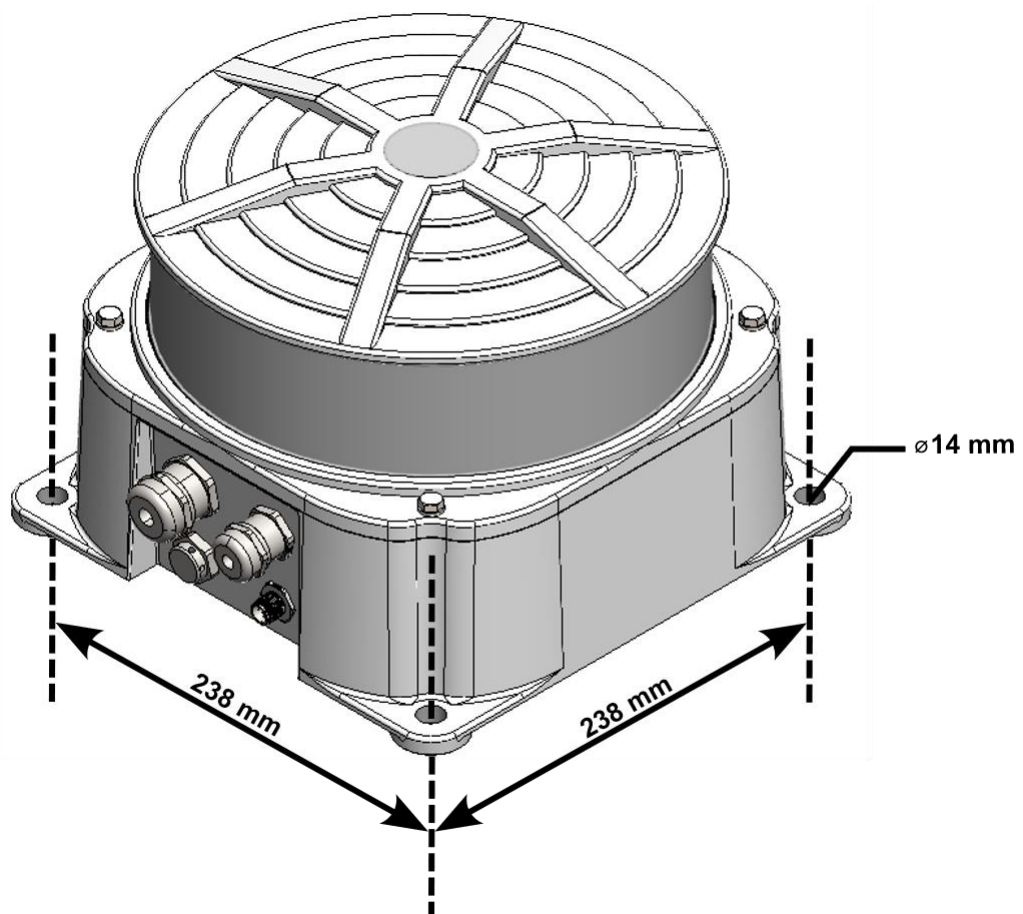
OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **9** sur **25**

6. Wiring

6.1. Caution before wiring

- **Power OFF**: Always ensure the main power supply is completely turned off before starting any wiring work.
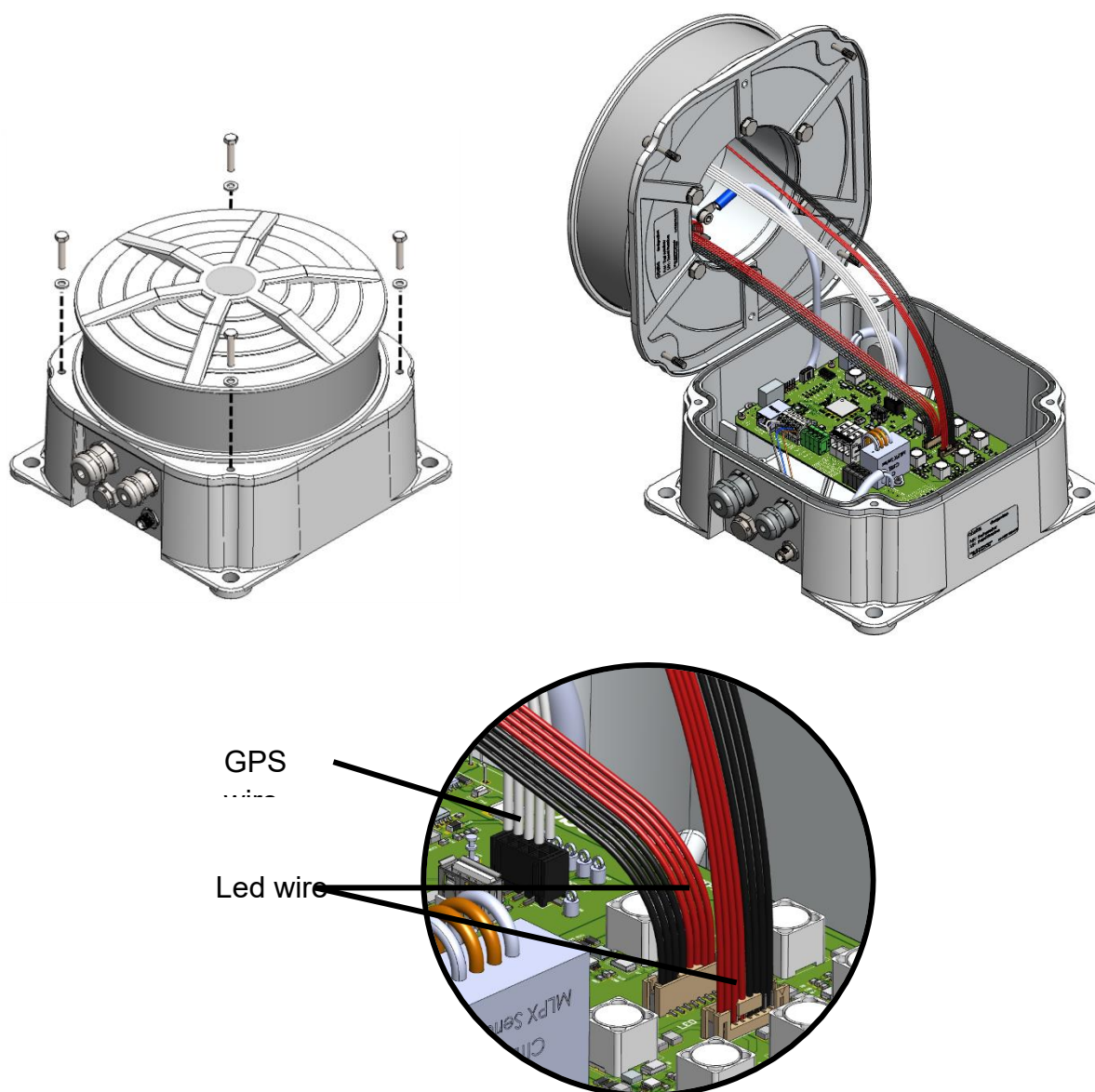- **Verify voltage**: Confirm the voltage level of the circuit. Be aware of high-voltage hazards.
- **Use proper PPE**: Wear personal protective equipment (insulated gloves, safety glasses and safety shoes).
- **Secure the work area**: Ensure the aera below is cordoned off to prevent injury from falling tools or components.
- **Chek 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 2x1.5mm² 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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **10** sur **25**

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.

GPS wire

Led wire

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **11** sur **25**

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.

OFC-RW-   **OFC-RW-**
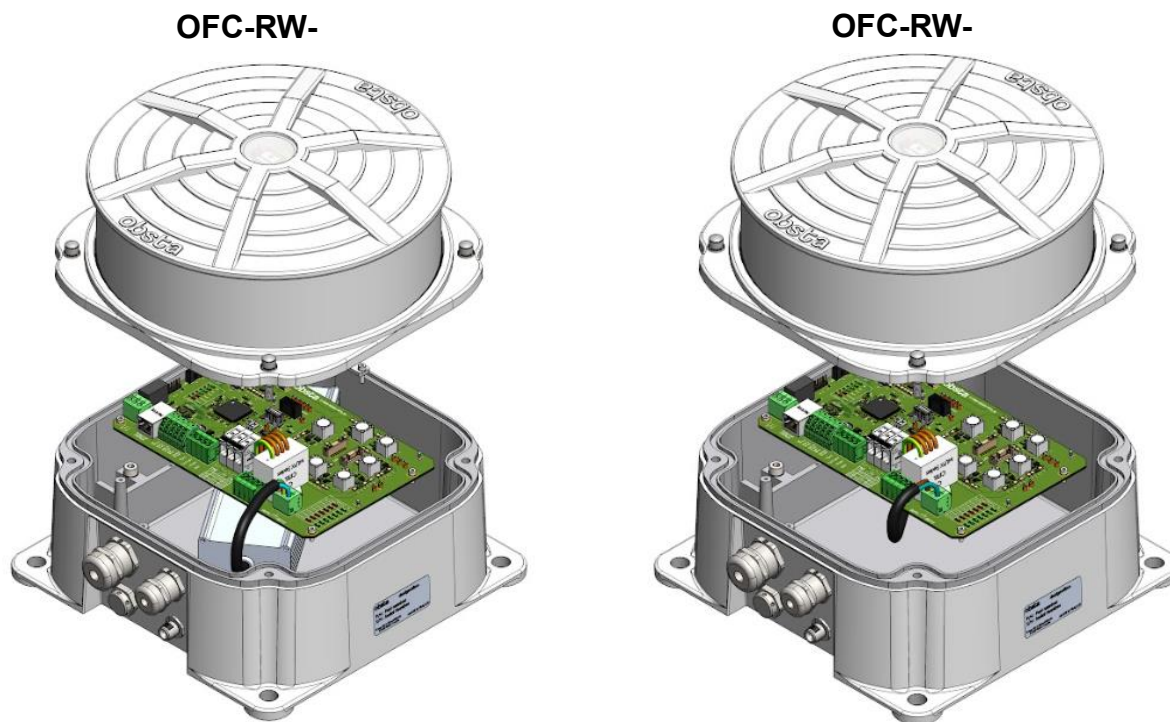
6.3.2. PCB led (lamp)

Inside the flash-head, each optic contains a PCB with a circuit of 8 white, 3 red and 1 infrared led.
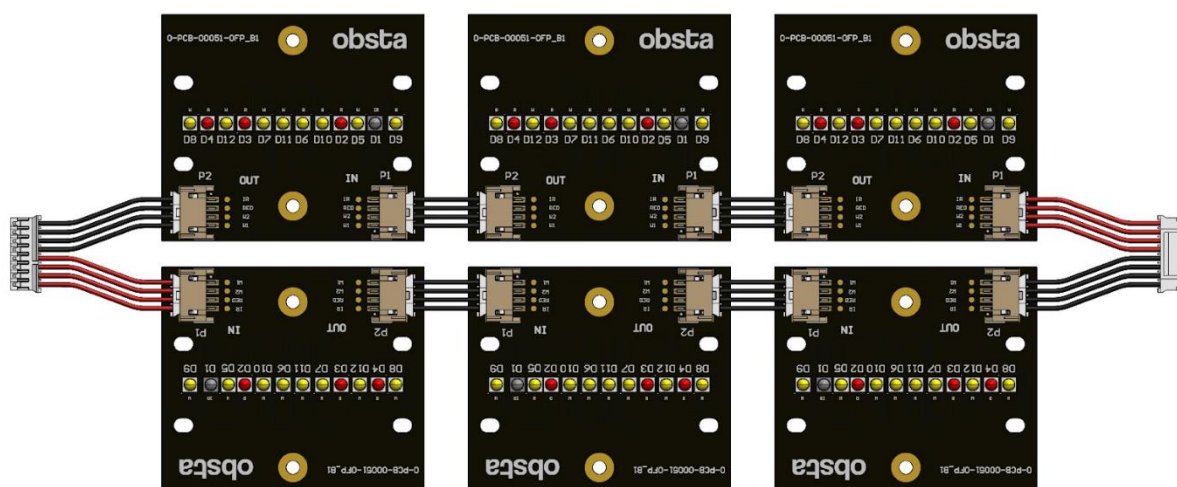
OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **12** sur **25**

6.3.3. Main card (box)

Input for 240 power supply (**only for 114792-240**)

SW

USB

Surge protection

SW

Operation led

Alarm

Beacon led issues

CAN terminal connection

Synchronization terminal connection

Power supply

Output for 240 power supply (**only for 114792-240**)
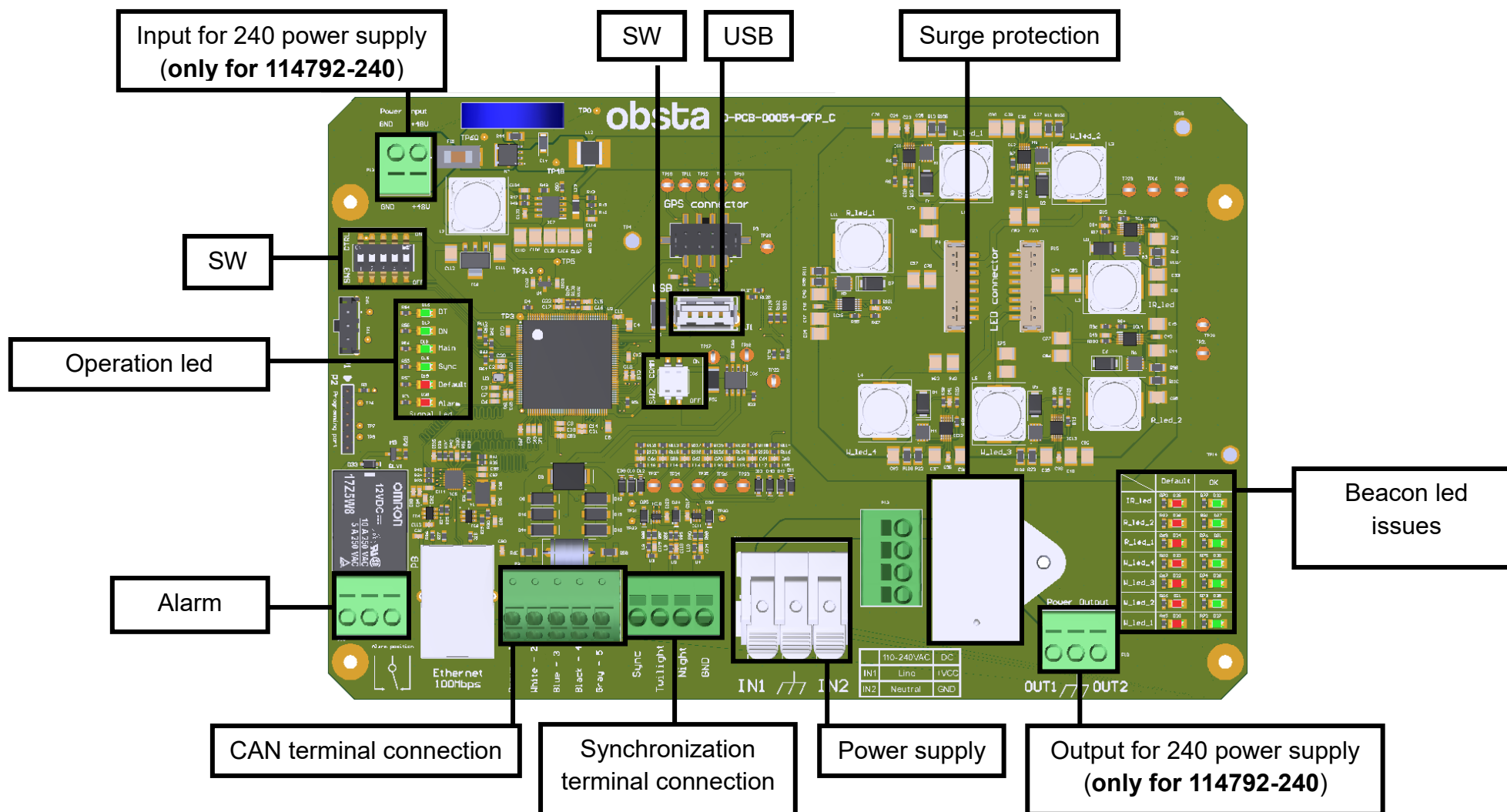
OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **13** sur **25**

6.4. 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.

Tape end to prevent shield removal

15mm
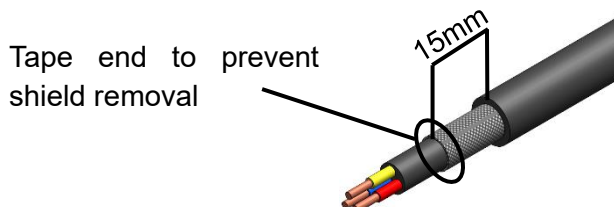
- Thread the cable through the cable gland (the ring is loosened but not removed) so that the shield is in contact with the gland springs.
- The gasket must be correctly positioned flat and in its housing for optimum sealing.

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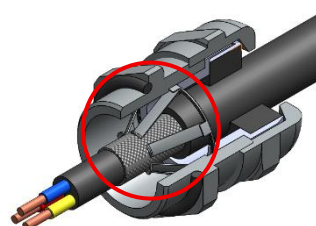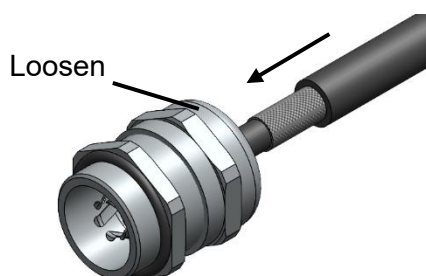
- Tighten the gland ring with the appropriate wrench.
- Once the cable has been clamped in the cable gland, cut and strip the wires to the length required to connect the terminal blocks (don't forget to fit cable ferrules before connection).

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

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **14** sur **25**

6.5.   Typical wiring

The following typical wiring are provided for illustrative purposes only.

OFD 240 Vac
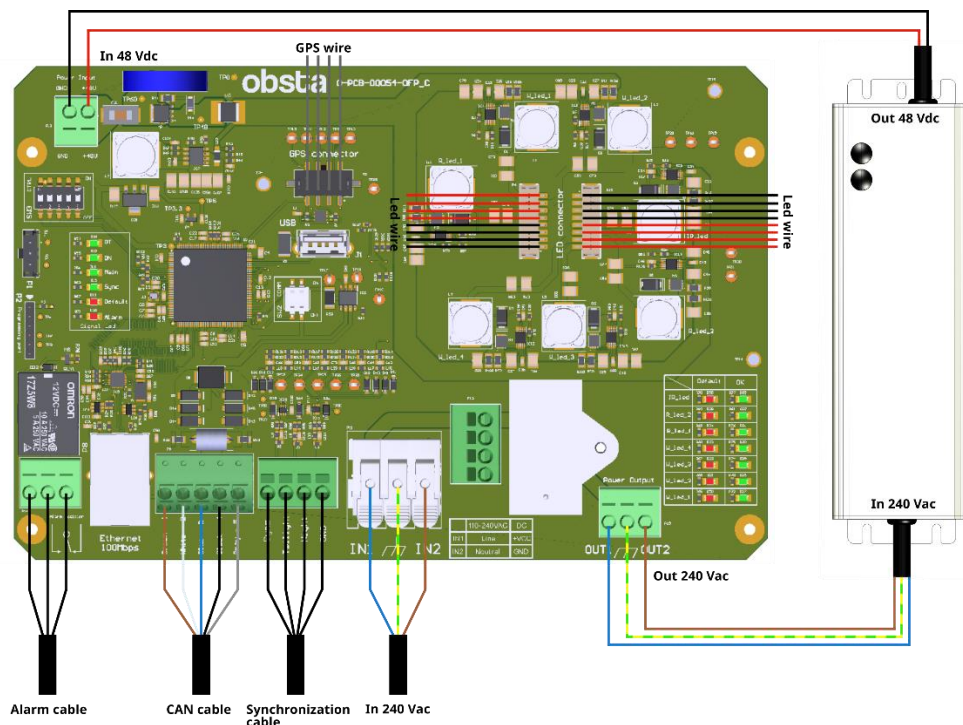
OFD 48Vdc
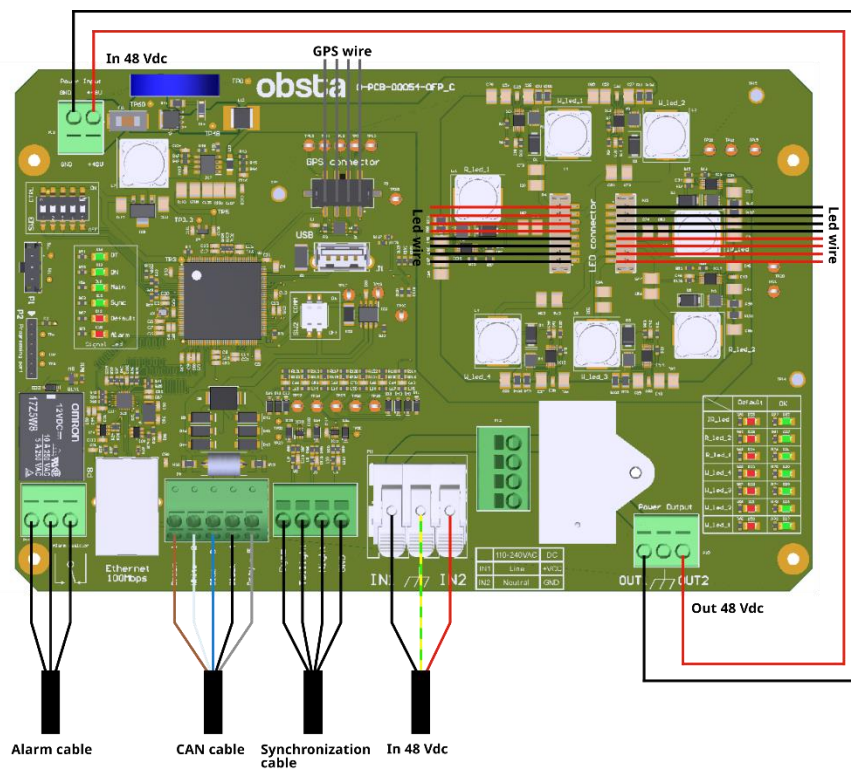
OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **15** sur **25**

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
ON (I)	Nominal	Master	Override	Override	-
OFF (0)	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
ON (I)	-	End of line resistor activated
OFF (0)	-	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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **16** sur **25**

7.3. USB

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

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **17** sur **25**

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.

- **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).
  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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **18** sur **25**

- **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.

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **19** sur **25**

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. "Main" led sequence

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

7.5.2. Operation issues

Led	Bootloader	Init	Normal operation
DT	OFF	Continue	If DTN mode is set to DTN_NIGHT or DTN_TWILIGHT If mode is forced: fast blinking else continuous. Others turned off
DN	OFF	Continue	If DTN mode is set to DTN_NIGHT: If mode is forced: fast blinking else continuous. Others turned off
Main	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
Sync	OFF	Continue	Turn on during 100ms upon each rising edge of TOP_SYNC (whatever the signal is incoming or outgoing). Others turned off
Default	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
Alarm	OFF	OFF	Turned on if relay is powered off (lamp issues)

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **20** sur **25**

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 *Exception: this event will be signaled after USB key removal, during a 10 sec delay.*	— 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

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **22** sur **25**

7.5.4. Default

Default	Condition	Red led signal	Lamp signal
Power supply	Detected if over or under voltage.	· · · · · · · · Short blinking	OFF
Invalid configuration	Means inconsistency in received parameters.	─ · · · 1 long and 3 short	OFF
Light channel error	Number of channels error until default mode for the selected configuration number and for the current light mode.	· · 2 short	-
Light relay error	Number of channels error until activating relay for the selected configuration number and for the current light mode.	· 1 short	-
Slave out of synchronization	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	-
GPS out of synchronization	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
DTN mode unchanged	The DTN mode did not change and has not been forced since the last 48h.	─ 1 long	-
External communication problem	Communication through Ethernet has failure. CAN is activated but "not connected" and the system starts up after more than 30 min	─ ─ 2 long	-
DTN from GPS not available	GPS signal is lost for more than 30 minutes	─ ─ · 2 long and 1 short	-

Page **23** sur **25**

8. Maintenance

8.1.   Annual visit

Test	Frequency	Preventive action	Risk
Aspect (rust, dust…)	Annual	Exterior cleaning Check the condition of the lamp head glass	Malfunction
Clamping	Annual	Checking tightness	Lamp falling Tightness degradation
Wiring	Annual	Visual control Tightening cable glands Tightening PCB wire	Cable damage Poor electrical contact Short circuits
Waterproof	Annual	Lamp visual verification	Water infiltration Short circuit Lamp off
Light performance	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**]

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **24** sur **25**

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 (white day mode)	-	-	5	A
Average power consumption (with 20fpm – 200ms day mode)	-	-	15	W
Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

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 (white day mode)	-	-	0.8	A
DC output voltage for the flash-head	-	48	-	Vdc
Cold starts to inrush current	-	-	65A (500µs)	A
Average power consumption (with 20fpm – 200ms day mode)	-	-	15	W
Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

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	-	-

OBSTA
3, impasse de la blanchisserie
51052 Reims CEDEX – France
This document is the property of OBSTA. It may not be reproduced or communicated to third parties without the written permission of OBSTA
Page **25** sur **25**