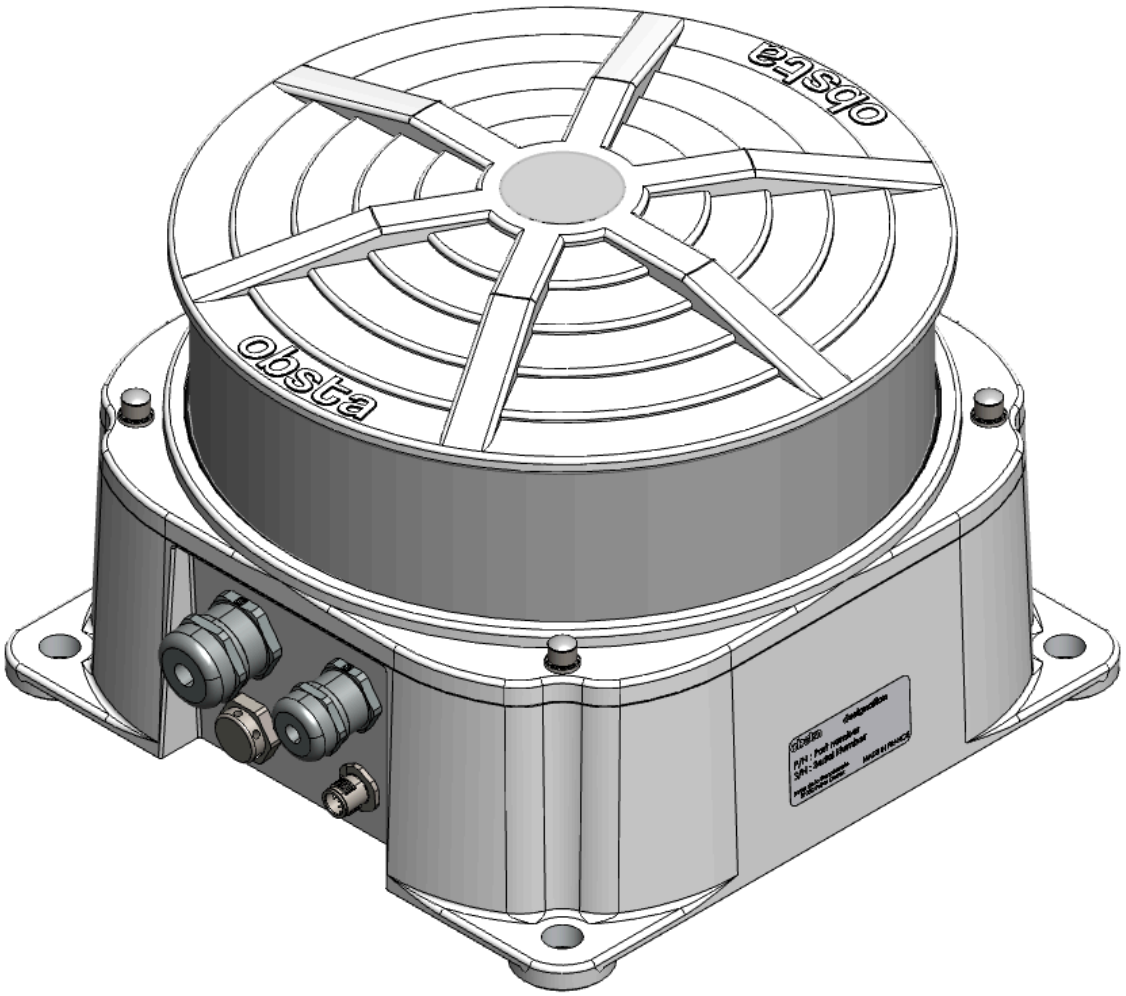
RELIABILITY IN OBSTRUCTION LIGHTING
BALISAGE AÉRIEN

OFD-RW-048 // 113792-048
OFD-RW-240 // 113792-240



Obsta
3, impasse de la blanchisserie
51052 Reims CEDEX - FRANCE

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3, impasse de la blanchisserie
51052 Reims CEDEX - FRANCE

1. Product name and part number

Description	Norm	Article code	Power supply	QR code
OFD-RW-048	Medium intensity ICAO type A,B and C	114792-048	48 Vdc	
OFD-RW-240	Medium intensity ICAO type A,B and C	114792-240	110-240 Vac	

2. Be careful

- Do not proceed 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
- 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.
- Otherwise specified all cable must be shielded.
- 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. General information

4.1 Scope

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

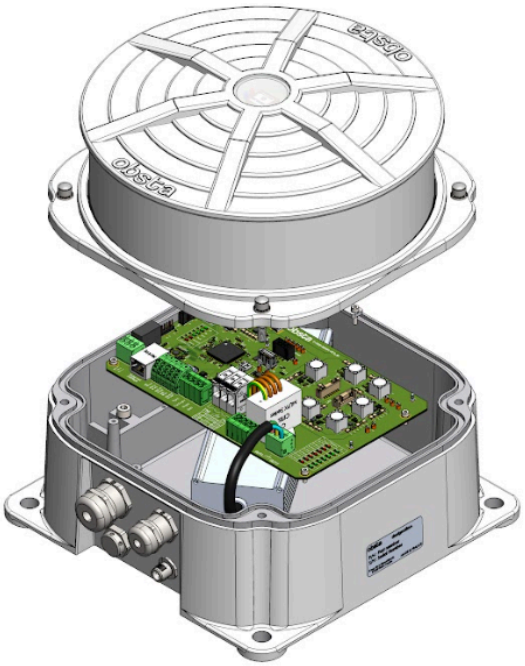
The OFD includes:

- A light flash-head with 6 luminous parts.
- A lamp and an interface (Cable gland + terminal connection on the PCB).
- Power supply (only for OFD-RW-240).
- Cards |Commande
  |GPS
  |Led card
- Wire harness |Led pcb
  |Main board
  |GPS

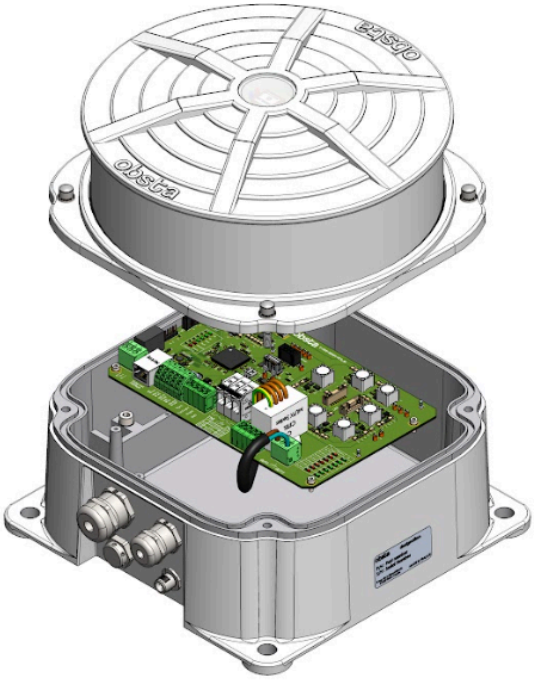
The attachment of the flash-head is done with 4 M6 screws. Waterproof is done through a 70 shore O-ring between the flash-head and the box (lamp holder). The OFD is IP66 class.

4.3 OFD 048 and 240

OFD-RW-240

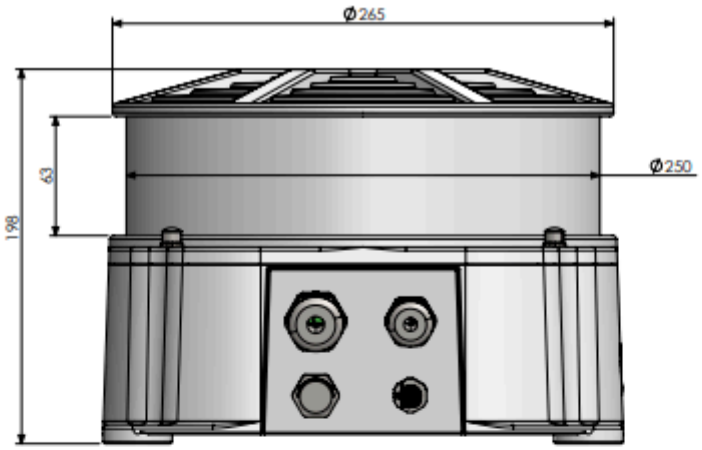


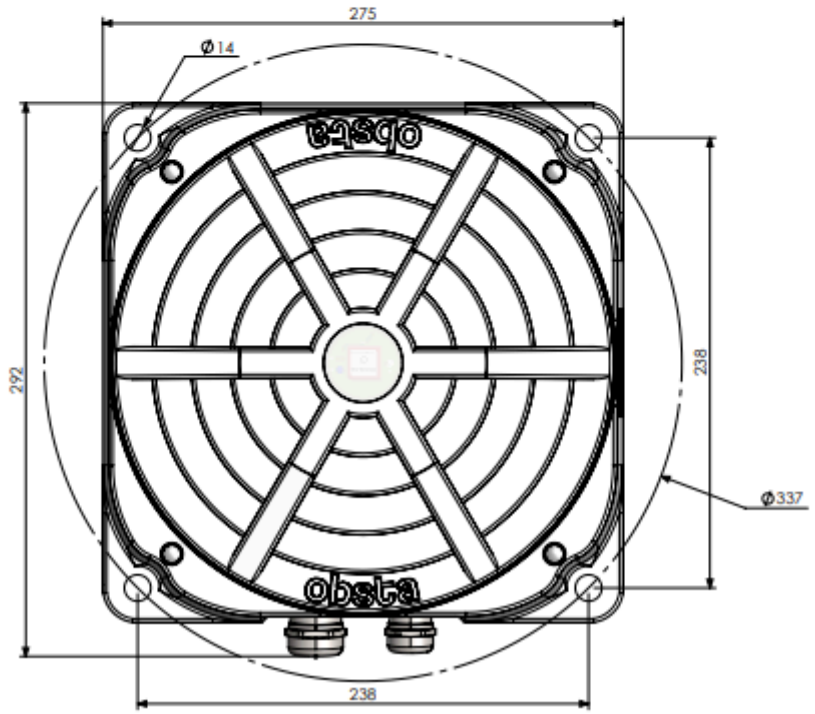
OFD-RW-048



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

4.4 Size of the light





5. Technical specification

5.1 Light output (standard configuration)

Name	Parameter	Min	Nominal	Max	Unit
FL_{rate}	Flash Rate	20	30	60	*FPM*
B_{pat}	Beam pattern				
BP_{h}	Horizontally	-	360	-	°
BP_{v}	Vertically	3			°
LUM_{day}	Day luminosity +- 25%	-	20 000	-	*Cd*
LUM_{twi}	Twilight luminosity +-25%	-	20 000	-	*Cd*
LUM_{night}	Night luminosity +-25%	-	2 000	-	*Cd*
FD_{day}	Flash duration day	200	-	Continuous	*ms*
FD_{twi}	Flash duration twilight	200	-	Continuous	*ms*
FD_{night}	Flash duration night	200	-	Continuous	*ms*

5.2 Alarm

Alarm will be set when some conditions are met, depending on the configuration and switches. Free contact (relay 10A 250Vac max / 5A 30Vdc max)

5.3 Electrical input for 48 Vdc

Name	Parameter	Min	Nominal	Max	Unit
V	DC power input voltage	43	48	53	Vdc
P_{avc}	Average power consumption *(with 20fpm - 200ms day mode)*	-	-	15	W
V_{logic}	Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

5.4 Electrical input for 120-240 Vac

Name	Parameter	Min	Nominal	Max	Unit
V	AC power input voltage	110	120 /240	264	Vac
F	AC frequency	47	50/60	63	Hz
V	DC output voltage for the flash head	-	48	-	Vdc
P_{avc}	Average power consumption *(with 20fpm - 200ms day mode)*	-	-	15	W
V_{logic}	Voltage for signal (synchro, night, twilight)	30	48	55	Vdc

5.5 Mechanical properties

Name	Parameter	Min	Nominal	Max	Unit
M_{fh240}	Mass of the flash head (240 version)	-	9.3	-	kg
M_{fh048}	Mass of the flash head (048 version)	-	8.3	-	kg
F_{wind}	Max wind force under 320 km/h (Flash-head)	-	227	-	N
DIM_i	**Dimension w/h/d**				
DIM_{cab}	Cabinet	-	198 x 292.5 x 275	-	mm
DIM_{fl}	Flash-head	-	270 x 270 x 105	-	mm

5.6 Operating environment

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

6. Operation

6.1 System components

6.1.1 light

6.1.2 Flash-head

The flash head (lamp) comprises 6 lenses, each equipped with a pcb comprising 8 white, 3 red and 1 infrared LED.

6.1.3 The box

The box contains the PCB (command card) that contrôle the light output. It is very important to ensure the O-ring is placed correctly while closing the flash-head.

6.1.4 Command card (PCB)

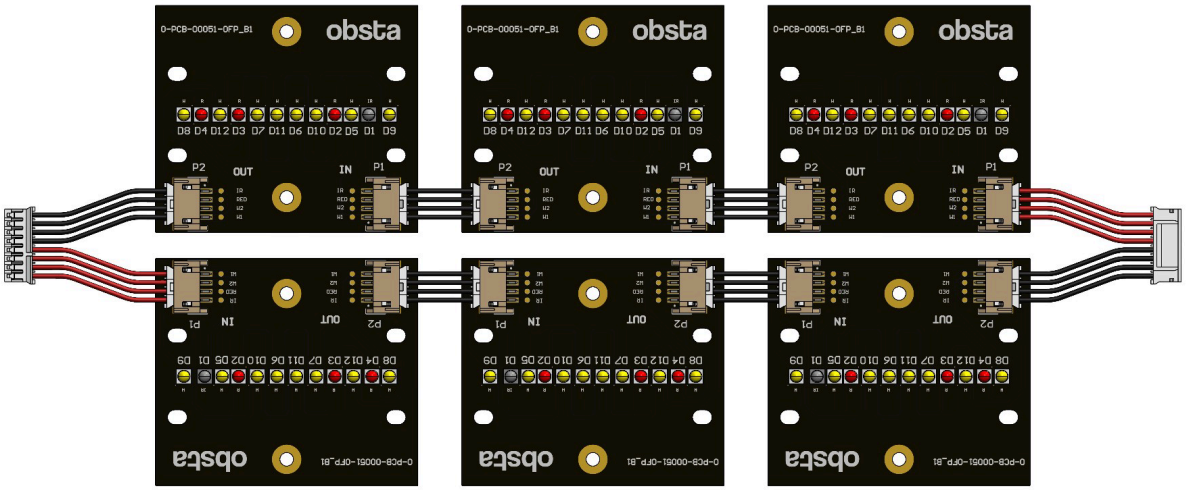
The command card inside the light ensures the conversion of the power supply input, the contrôl of the current for the 6 led circuits inside the flash-head. Setting of the light (master/slave), synchronisation, GPS and alarm.

6.1.5 Shunt braid

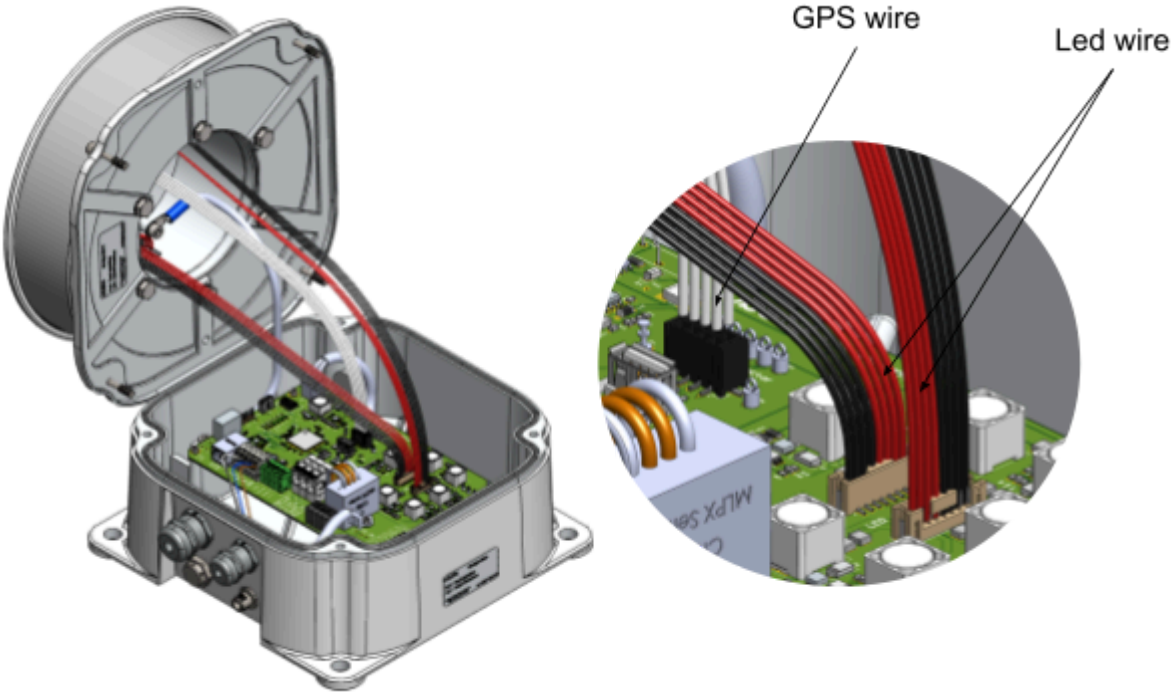
The flash-head is attached to the light body through a shunt braid. The shunt braid ensures the grounding of the light and prevents losing the flash -head during installation.

6.1.6 PCB led of the lamp

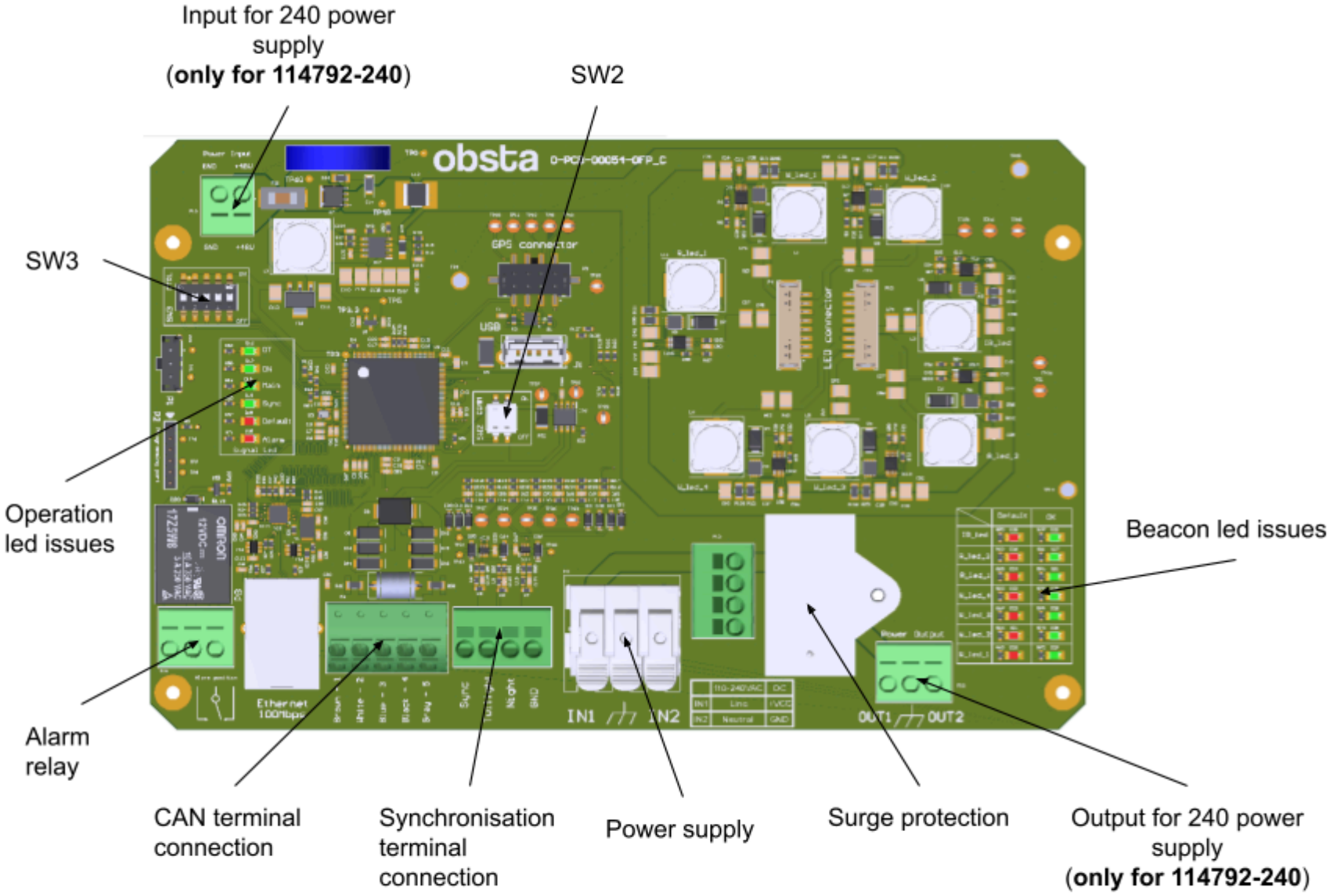
Inside the flash-head, each optic contains a PCB with a circuit of 8 white, 3 red and 1 infrared LED.



6.1.7 Connection between the PCB Led (flash-head) and the command card



6.2 Card feature



6.3 Configuration

6.3.1 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

6.3.2 SW2

SW2 setting		
	1	**2**
ON (I)	-	End of line resistor activated
OFF (0)	-	End of line resistor desactivated

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. Installation

7.1 Unpacking

Carefully unpack the light and remove any internal packing material. Examine each item for obvious physical damage. Immediately report any claims to the carrier. Installation drawings are included in the power supply carton.

7.2 Mounting and preparation

7.2.1 Installation of the light

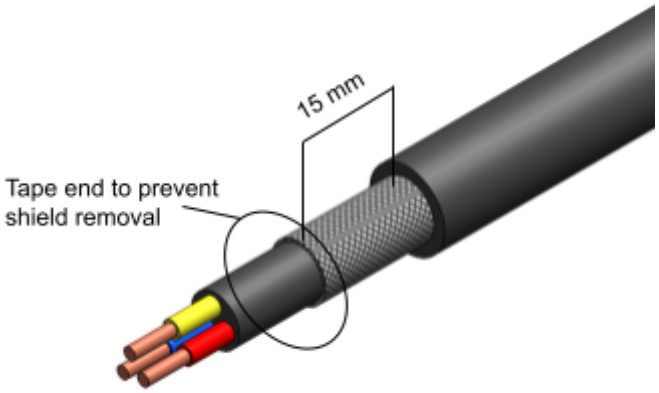
The light assembly fixture must be mounted perfectly horizontally to meet the optical specification required for Aircraft Obstruction lights. If mounted in another position, the fixture will not be considered as an Aircraft Obstruction lights.
We recommend that the metallic base of the light be connected through a grounding kit to the local grounding of the tower.

We strongly recommend taping the cable glands through which the connection cables pass after tightening.

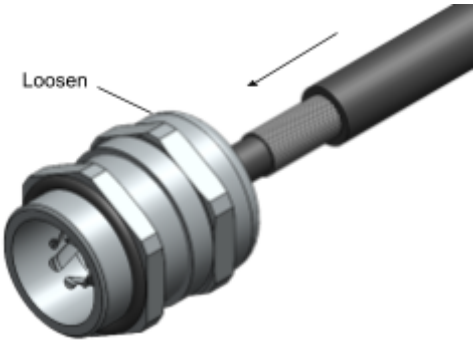
7.2.2 Cable gland

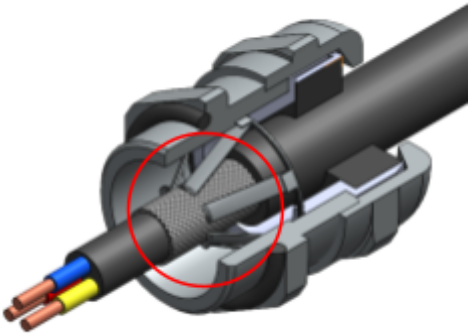
As a reminder, all shielded cables must be earthed at both ends. It is the installer's responsibility to check that OBSTA cabinets and lamps are correctly wired.

- 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

7.2.3 Electrical wiring inside the light

- Alimentation : (6mm²)
  - 240Vac : IN1 = Line
Earth
IN2 = Neutral
  - 48Vdc: IN1 = +48Vdc
IN2 = -48Vdc (GND)

- Alarm: (1.5mm²)
  - Dry contact (relay 10A 250Vac max / 5A 30Vdc max)

- Synchronisation: (1.5mm²)
  - Master mode: Not used .
  - Slave mode: Connect the « + » and « - » of the master unit to the the « + » and « - » of the same terminals of all slave units so that flashes are synchronized Note : In this case, check carefully the wiring diagram after installation.

- DTN : (1.5mm²)
  - Five light modes are defined: Day, Twilight, Night, Default1 and Default2. The three first ones (DTN) are activated when light is operating in acceptable conditions, when the corresponding DTN mode is active

7.3 Checking during and after the installation

- Tightening of the cable glands
  It is the responsibility of the person involved during the installation to correctly tighten the cable glands according to the cable used: too much tightening can cause a leakage, too little tightening can cause water inside

- Wiring:
  Use wire end ferrules
  Check the power cable on the terminal connection
  Check the ground is connected on the terminal connection
  Check the synchronisation cable (if used)
  In option, add black shrinking ‘or 3M scotch) on the cable glands

- 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 closes 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.

It is very important to check the wiring and the above points to ensure a good operation of the light and waterproof.

8. USB

8.1 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.

8.2 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 (beacon)
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 10.3.
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 after 2 minutes.

Refer to section 10.3 for USB-related error codes.

8.3 USB interface function

1. **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 (DTN MODE SOURCE, TOP SYNCHRO SOURCE, etc.).
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.

2. **User data extraction:** This function allows for retrieving data recorded on the card for analysis or duplication.

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.

3. **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 Address

Where X, Y and Z are integers between 0 and 255. Insert the USB drive into OFD card port (alternating red/green LED flashing).

4. **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.

9. Maintenance

9.1 Annual visit

Test	Frequency	Préventive 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 wires	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

9.2 Spare part

- Main board []
- Flash head []
- Power supply []

10. 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.

10.1 Operation issues

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

10.2 “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	Erreur lors de l'écriture d'un nouveau programme dans la mémoire flash	Reset microcontroller
··· 3 short	Unexpected error	Undefined

10.3 USB error

Upon USB firmware update or log retrieval, problem 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, 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 unmountingUSB 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 ad 2 short
Error when processing USB events: unexpected event.	—— 2 long

10.4 Default

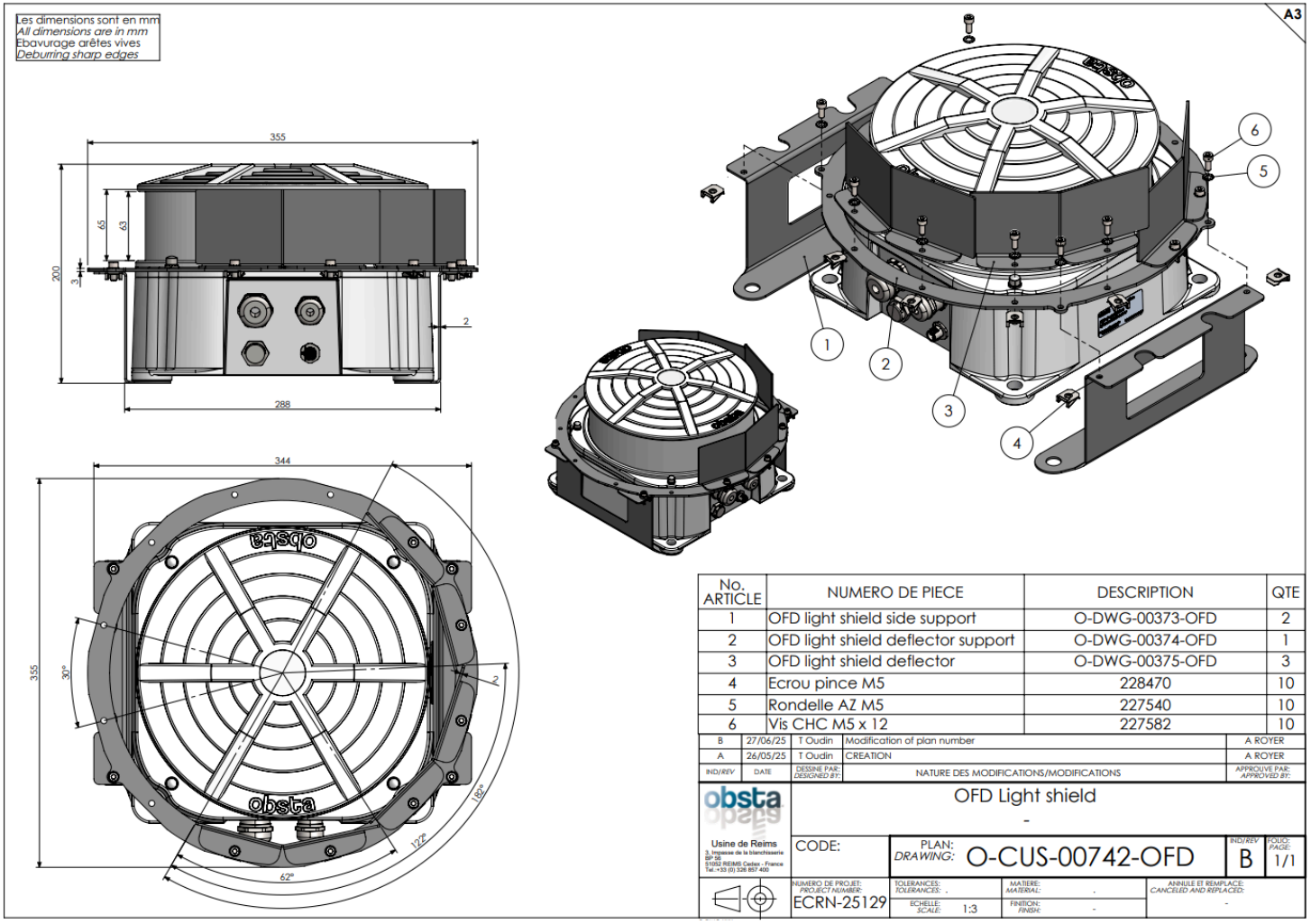
Default	Condition	Red led signal	Lamp signal
Power supply voltage	Detected if over or under voltage.	····· Short consciously blinking	OFF
Invalid configuration	Means inconsistency in received parameters.	—··· 1 long and 3 short	OFF
Light channel error	Number of channels error until default mode for the 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 é"top synchro signal" has been received in the last 10 seconds.	—· 1 long and 1 short	-
GPS out of synchronisation	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 FMP
DTN mode unchanged	The DTN mode did not change and has not been force since the last 48h.	— 1 long	-
External communication problem	Communication through Ethernet as failures. 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	-

- The “seq impact” column indicates if the activation of a given default modifies the current sequence of currently activated mode (When “OFF” is specified, it means no flash shall occur).

- During initialization after start-up, the GPS chip waits for a precise signal. When preliminary signals are received, the GPS status LED may blink or light up (Operation led issues).
  Once the preliminary signals have been received, it may take up to 15 minutes for the card to receive a complete, valid signal, enabling the product to synchronize correctly. During this phase, synchronization may not be fully valid and a GPS fault may occur. We recommend waiting at least 20 minutes before considering the synchronization valid. If a GPS default led is still activated after 20 minutes, the product is not receiving signals correctly.

11. Accessories

11.1 Shield



No. ARTICLE	NUMERO DE PIECE	DESCRIPTION	QTE
1	OFD light shield side support	O-DWG-00373-OFD	2
2	OFD light shield deflector support	O-DWG-00374-OFD	1
3	OFD light shield deflector	O-DWG-00375-OFD	3
4	Ecrou pince M5	228470	10
5	Rondelle AZ M5	227540	10
6	Vis CHC M5 x 12	227582	10

IND/REV	DATE	DESSINE PAR: DESIGNED BY:	NATURE DES MODIFICATIONS/MODIFICATIONS	APPROUVE PAR: APPROVED BY:
B	27/06/25	T Oudin	Modification of plan number	A ROYER
A	26/05/25	T Oudin	CREATION	A ROYER

obsta
Usine de Reims
3, impasse de la blanchisserie
BP 58
51052 REIMS Cedex - France
Tel.: +33 (0) 326 857 400

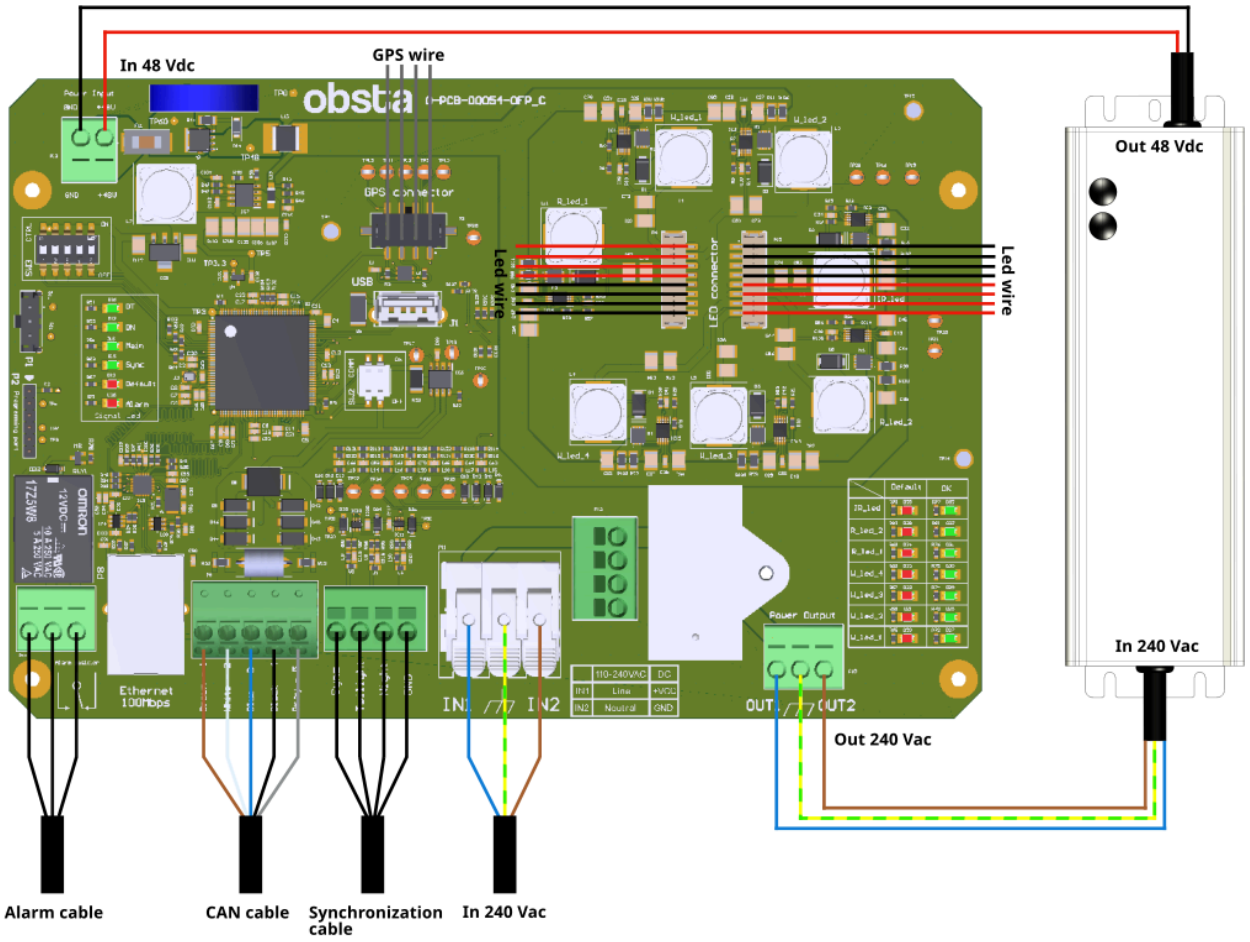
OFD Light shield
-

CODE:
PLAN: DRAWING: O-CUS-00742-OFD
IND/REV: B
FOLIO: PAGE: 1/1

NUMERO DE PROJET: PROJECT NUMBER: ECRN-25129
TOLERANCES: TOLERANCES: .
ECHELLE: SCALE: 1:3
MATIERE: MATERIAL: -
FINITION: FINISH: -
ANNULE ET REMPLACE: CANCELED AND REPLACED: -

12. Typical wiring

12.1 OFD-240



12.2 OFD-048