RELIABILITY IN OBSTRUCTION LIGHTING
BALISAGE AÉRIEN

Red medium intensity system for transmission line

Operation and user guide:

OFC-RI-REM and **OFC-CTR-048-3G 1/13 2/13 & 10/13 (configuration 4)**

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Summary

Table of Contents

1 PRODUCT NAME AND PART NUMBER

Designation	Type	Power supply	Part number
OFC-CTR-048-3G 1/13 2/13 & 10/13	Controller for 3 levels of 2 flash-heads	48Vdc -5%; +10%	**113176-048-6G**
OFC-RI-REM	Red medium intensity flash-head		**113790RI-REM**
Photocell	Calibrated photocell for day/night switch	12Vdc-60Vdc	**100757-KIT**

The controller OFC-CTR-048-3G 1/13 2/13 & 10/13 contains:
- 6 command cards (1 per flash-head) P/N **113790RR-CMD-048**
- 3 GPS modules P/N **113746IV2** (1 per level with appropriate sequence 0/13 for mid level, 2/13 for top level and 10/13 for bottom level)
- an IoT gateway P/N **114802**
- a test button to bypass photocell and IoT and force day or night mode

2 BE CAREFUL

1) Do not proceed any maintenance job when the light is under operation

2) Power supply must be shut down when opening the flash-head

3) Installation must be performed only by electrically skilled operator and National electrical installation rules must be respected.

4) 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

3 WARRANTY

OBSTA warrants the equipment described in the instruction manual and sold to purchaser 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 OFC Red Medium Intensity Obstruction Lighting Systems manufactured by OBSTA 48VDC system. The lighting systems described in this manual are Medium intensity type B obstruction lights

4.2 General description

The OFC 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 6 OFC P/N **113790RI-REM** includes :

- A light flash-head with 6 luminous parts .
- A Lamp holder and an interface (Cable gland + terminal connection on the PCB)

The attachment of the flash-head is done with 2 latches. Waterproof is done through an O-ring between the flash-head and the lamp holder. The power supply is located at the bottom of the obstacle in the controller

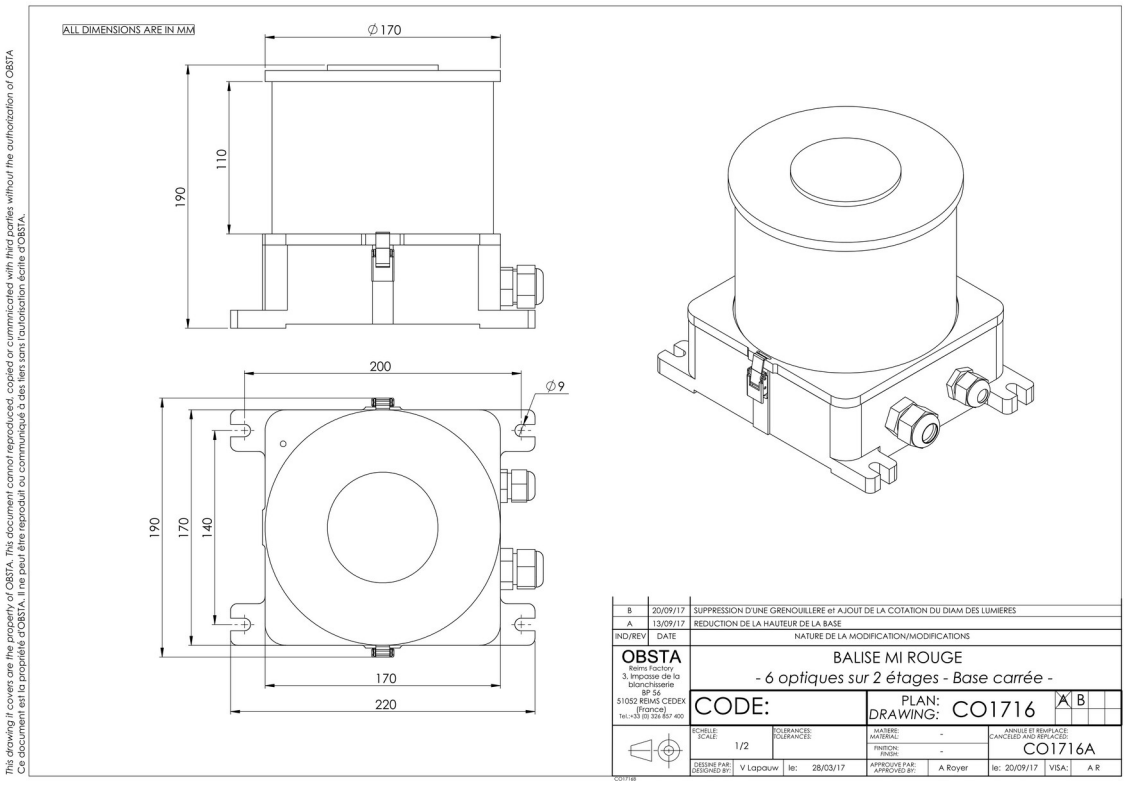
The controller P/N **113176-048-6G** contains:

- 6 command cards (1 per flash-head) P/N113790RR-CMD-048
- 3 GPS modules (1 per level with appropriate sequence 0/13 for mid level, 2/13 for top level and 10/13 for bottom level) P/N113746IV2
- an IoT gateway P/N114802
- a test button to bypass photocell and IoT and force day or night mode

and the terminal connection to

- the 6 flash-heads P/N 113790RI-REM (3 levels of 2 lights)
- the external photocell P/N 100757-KIT
- the 48VDC battery cabinet (DSO option) or the 48VDC solar kit

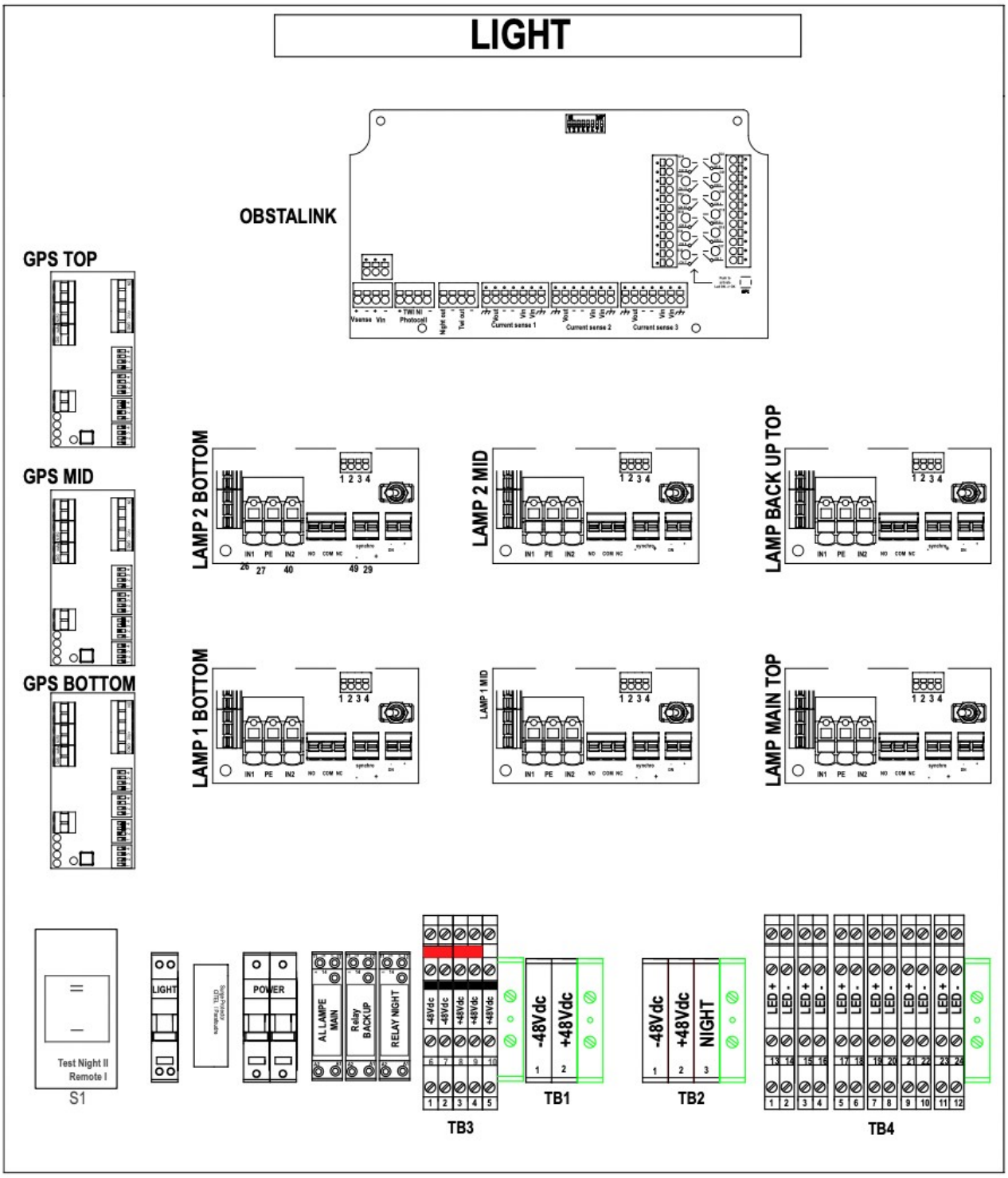
4.3 Size of the OFC P/N113790RI-REM



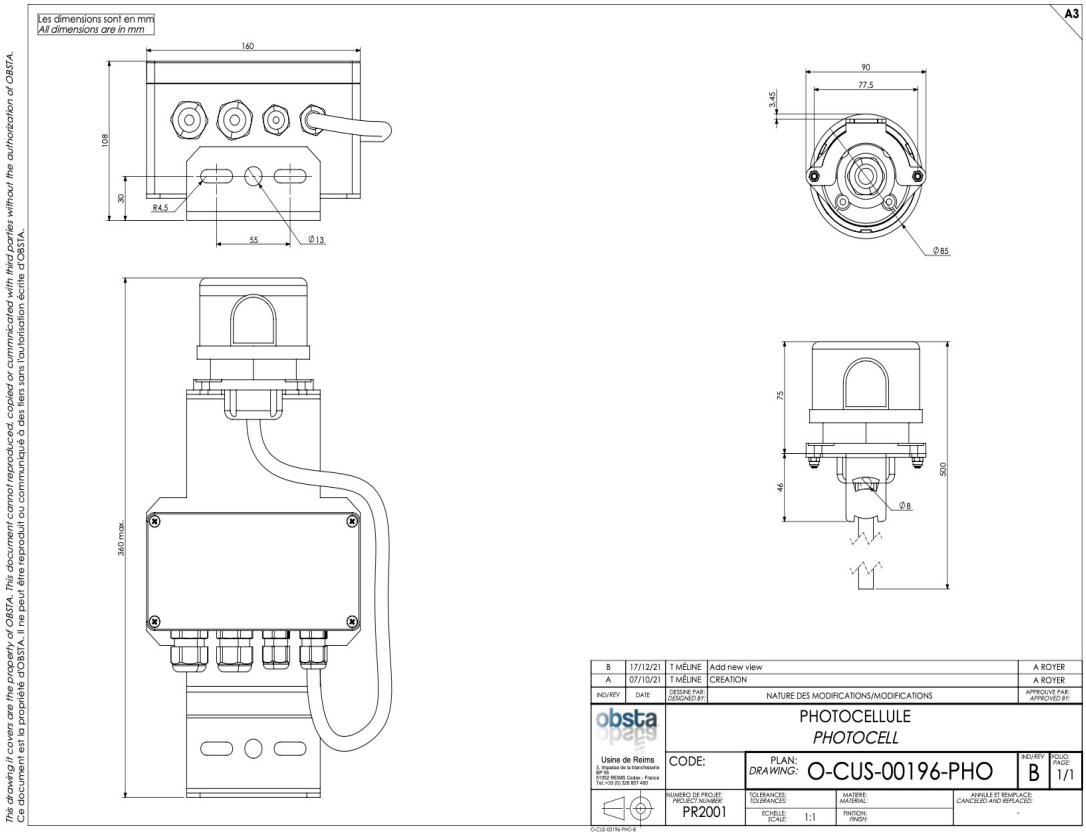
4.4 Size of the controller P/N113176-048-6G

The size of the controller is 750mm (height) x 750mm(width) x 420mm (dept)

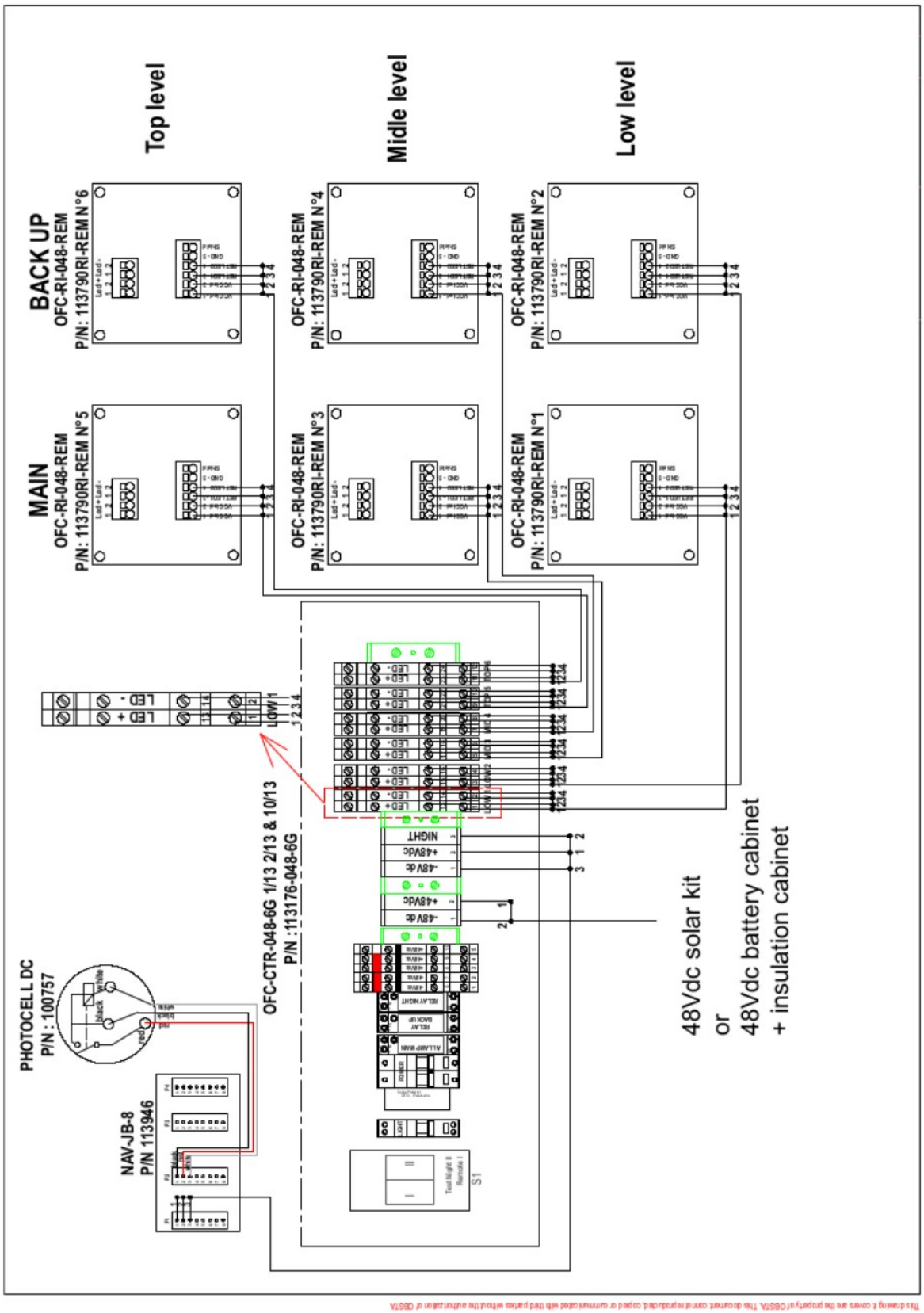
113176-048-6G



4.5 Size of the photocell P/N100757-KIT



4.6 Wiring diagram of the lights with controller and photocell



5 TECHNICAL SPECIFICATION

5.1 Light output of each flash-head

Intensity :	red 2000cd
Beam pattern :	360° horizontally; 3°min vertically
flash per minute :	20 to 60 flashes per minute depending on GPS setting
Synchronization :	All power unit in slave mode and monitore by the GPS Day/Night mode through external photocell
Alarm	Free contact (Relay 1A 250Vac max)

5.2 Electrical input of each command card + flash-head

Voltage :	48Vdc -5%; +10%	
Average Power :	5W @ 20 FPM	
Peak VA:	54.3 @ 48Vdc	
Max current :	1A @ 48Vdc	
Wiring :	Cable glands:	Ø7 to Ø13mm
	Terminal connections for power wires:	max 6mm² - 12awg
	Terminal connections for signal wires:	max 1.5mm² - 16awg

5.3 Mechanical properties of each flash-head

Weight	5 kg
Size (hxlxl)	190x190x220 mm
Attachment	M4 x4 (200x140 mm)
Surface area	~350 cm²
Wind load	10 kg max (@240km/h)

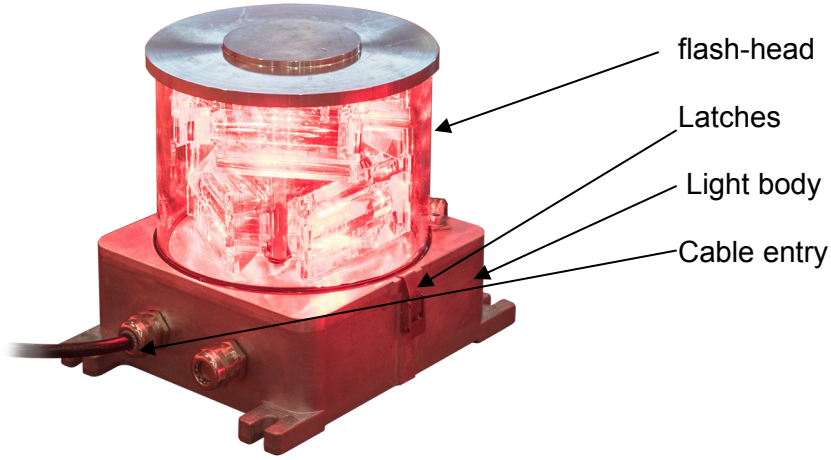
5.4 Operating environment

Operating temperature	-30°C to +55°C
Humidity	95%
Protection rate	IP66

6 Principles of operation

6.1 System components

6.1.1 flash-head 113790RI-REM



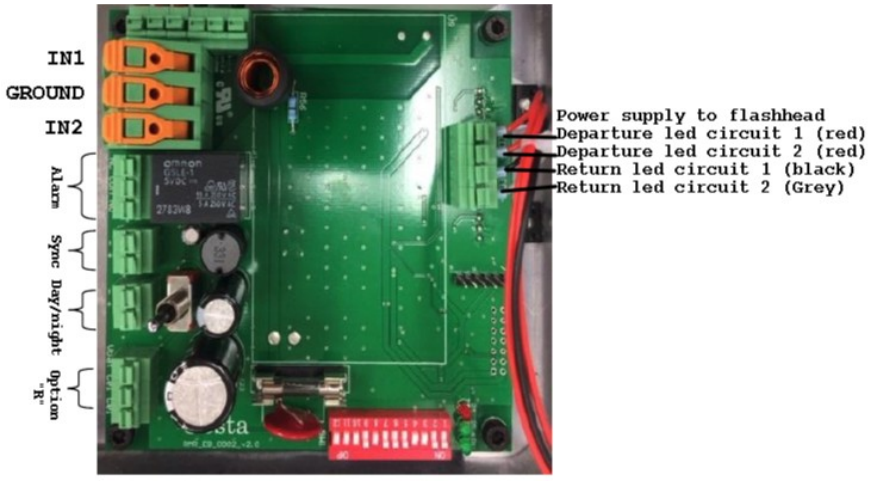
The flash-head includes 6 optics and 6 led strips that ensure the light output of the light. Each flash-head do have 2 independent led circuits.

The sealing of the light is ensure but the 2 latches and the O-ring between flash-head and the light body.

The light body contains the PCB to connect the 5G cable going down to the command card. It is very important to ensure the O-ring is placed correctly while closing the flash-head

6.1.2 Command card 113790RR-CMD-048 (PCB inside the controller) for each flash-head

Each flash-head is monitored through une command card that is located inside the controller



The command card inside the light ensures:

- The conversion of the power supply input
- The control of the current of the 2 led circuits inside the flash-head
- Setting of the light (master or slave) and its configuration (medium intensity type B)
- Synchronization of the flashes
- Alarm

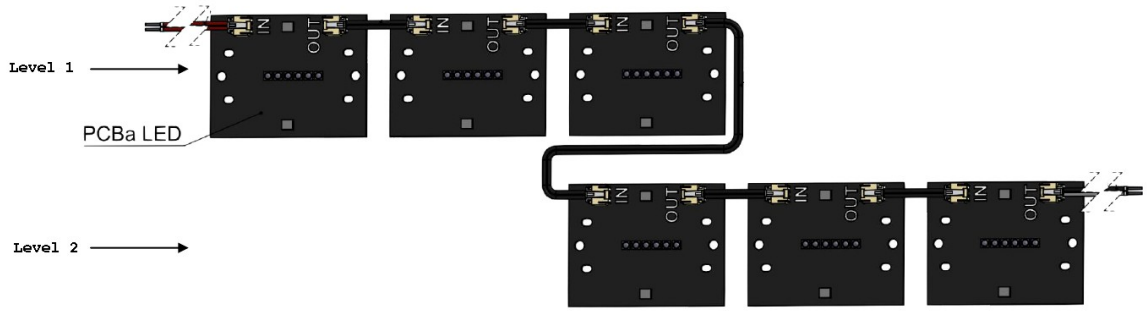
6.1.3 Shunt braid

The flash-head is attached to the light body through a shunt braid :

- Assure the grounding of the light
- prevent loosing the flash-head during installation

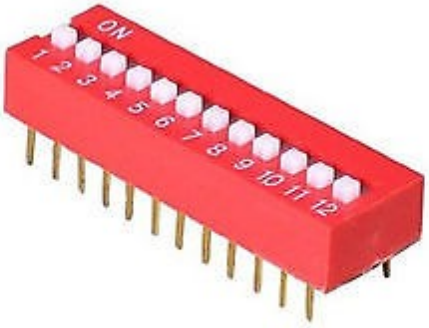
6.1.4 PCBa LED inside the flashhead

Inside the flashhead, each level contains 3 PCBa LED. Each PCBa LED contains one circuit with 3 red leds and one circuit with 2 red leds + 1 infrared led



6.2 Configuration on the command cards P/N113790RR-CMD-048

The setting of the light is done through the dip-switches on the command card.



Switch #	Default Value		Function	Comment
	ON	OFF		
1	X		**Normal** / Reset	Switch to reset the light and alarm (to be used only for maintenance)
2	X		Master / **Slave**	Slave mode (to be used for flash synchronization), the light waits for the pulse coming from the GPS
3		X	Over ride circuit 1	Force led circuit 1 to operate (bypass defaults)
4		X	Over ride circuit 2	Force led circuit 2 to operate (bypass defaults)
5-12	-	-	Factory setting of the light	Not to be changed

The switches 3 and 4 are to be used by trained operators: forcing the led circuits when alarm is activated can result in temporary or permanent destruction of the light.

The switches 5-12 are the setting of the program inside the command card on a binary code, 5 being the least significant bit and 12 the most significant bit **and should not modified**

6.3 GPS interface P/N113746IV2

See notice of the GPS in annex

6.4 IoT interface P/N114802

See notice of the IoT gateway

6.5 Photocell P/N100757

See notice of the photocell in annex

6.6 Switch on the command cards

After power on the light, following steps are performed on each command card:

- Initialization:
  - Activation of the alarm relay
  - Activation of all the internal function of the light
- Start of operation:
  - Checking the status of the system
  - Flash
  - Synchronization

3 leds are present to indicate the status of the system. If a default is found, those leds are activated and allows to identify a permanent default to the operator (Cf. see trouble some paragraph). The alarm relay is also activated to indicate remotely the status of the light.

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 is included in the power supply carton.

7.2 Mounting and preparation

7.2.1 Installation of the light

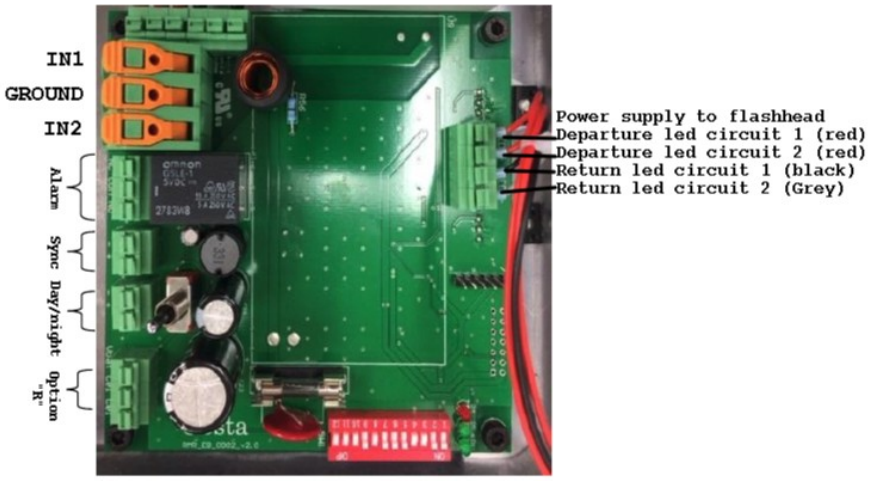
The light assembly fixture must be mounted perfectly on horizontal to meet the optical specification required for Aircraft Obstruction lights. If mounted in other position, the fixture will not be considered as an Aircraft Obstruction lights

We recommend that the metallic base of the light to be connected through a grounding kit to the local grounding of the tower

7.2.2 Cable gland on the flash-head

Between each flash-head and the controller, a 5G cable shall be used. External diameter of cable is Ø 7mm to 13mm for power supply cable

7.2.3 Electrical wiring of the command card



Power supply:

IN1 = +48Vdc
Ground
IN2 = Ground (-48Vdc)

Alarm:

Relay free contact : NO = Normally Open,
NC = Normally Close,
COM = Common.

When light is not powered or with default, NO/COM is closed and COM/NC is open (NO/COM open and COM/NC close if light normally working)

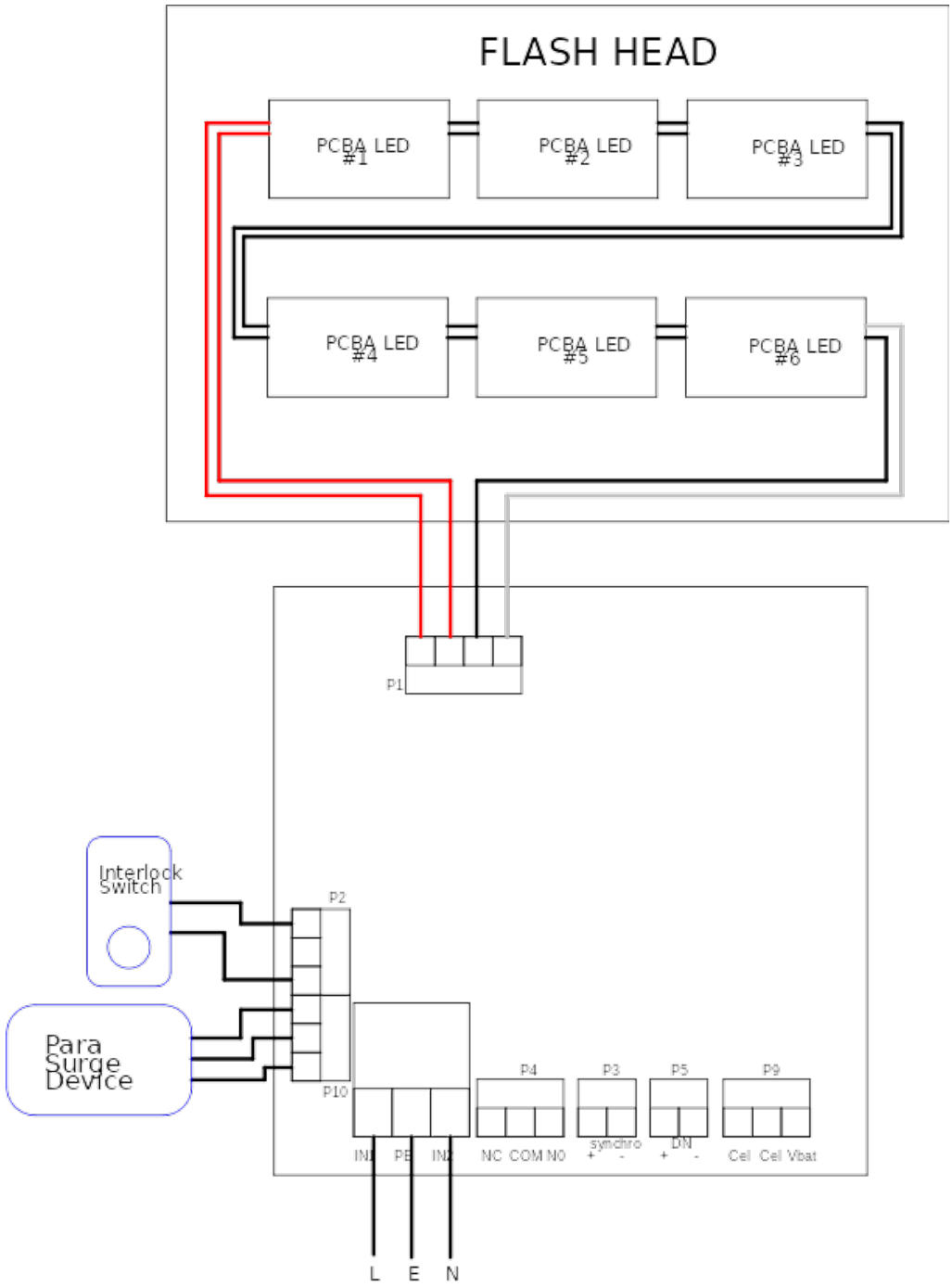
Sync :

Master mode: send a +48Vdc pulse (on the terminal connection « + ») that can be used for other lights in slave mode to flash at the same time.
Slave mode: Connect the « + » and « - » of the master unit to the the « + » and « - » of the same terminals of all slave units so that flashes being synchronized
Note : In this case, check carefully the wiring diagram after installation. If no pulse is received from the master unit, the slave unit(s) will flash at 15 flash per minute

Day/night :

Master mode: send a +48Vdc signal (on the terminal connection « + ») that can eventually be used for other light in slave mode to be switch on/off at the same time

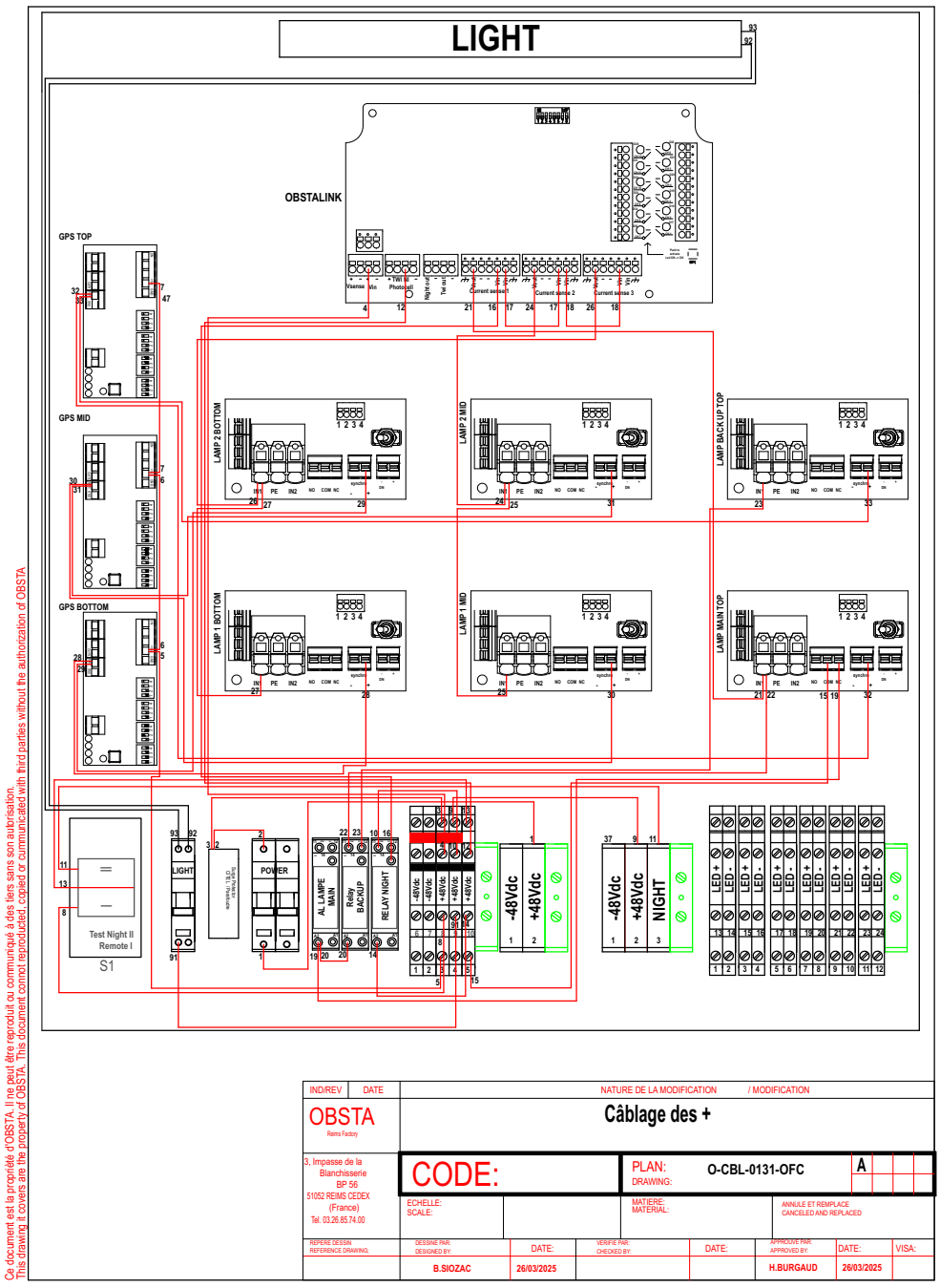
Slave mode: Connect the « + » and « - » of the master unit to the the « + » and « - » of the same terminals of all slave units so that day/night switch being synchronized


FLASH HEAD
PCBA LED #1
PCBA LED #2
PCBA LED #3
PCBA LED #4
PCBA LED #5
PCBA LED #6
P1
Interlock Switch
Para Surge Device
P2
P10
P4
P3
P5
P9
IN1
PE
IN2
NC COM NO
synchro
DN
Cell Cell Vbat
L
E
N

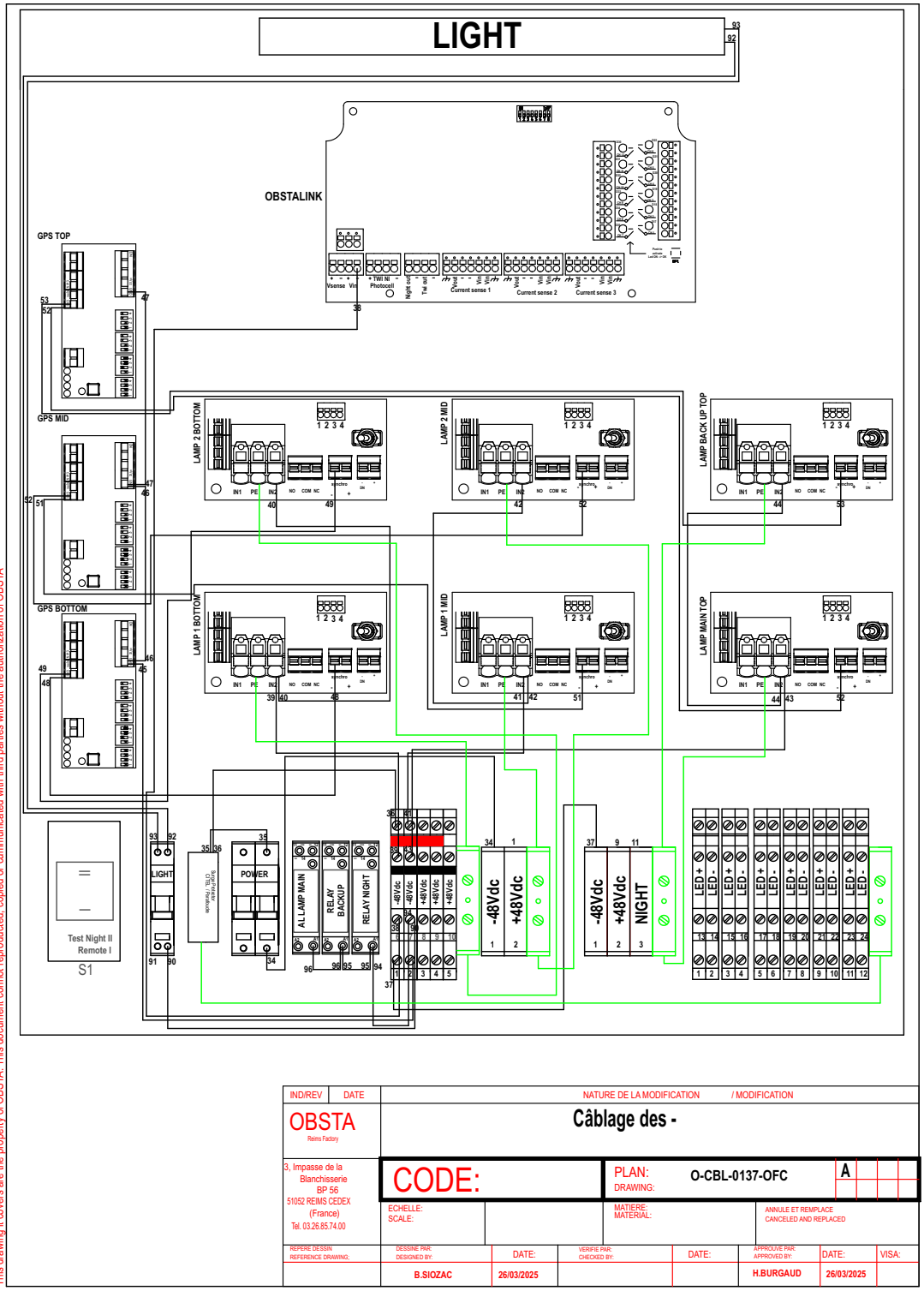
7.3 Controller

7.3.1 Internal wiring of the 6 command cards to the 3 GPS and the power wires + and -

113176-048-6G

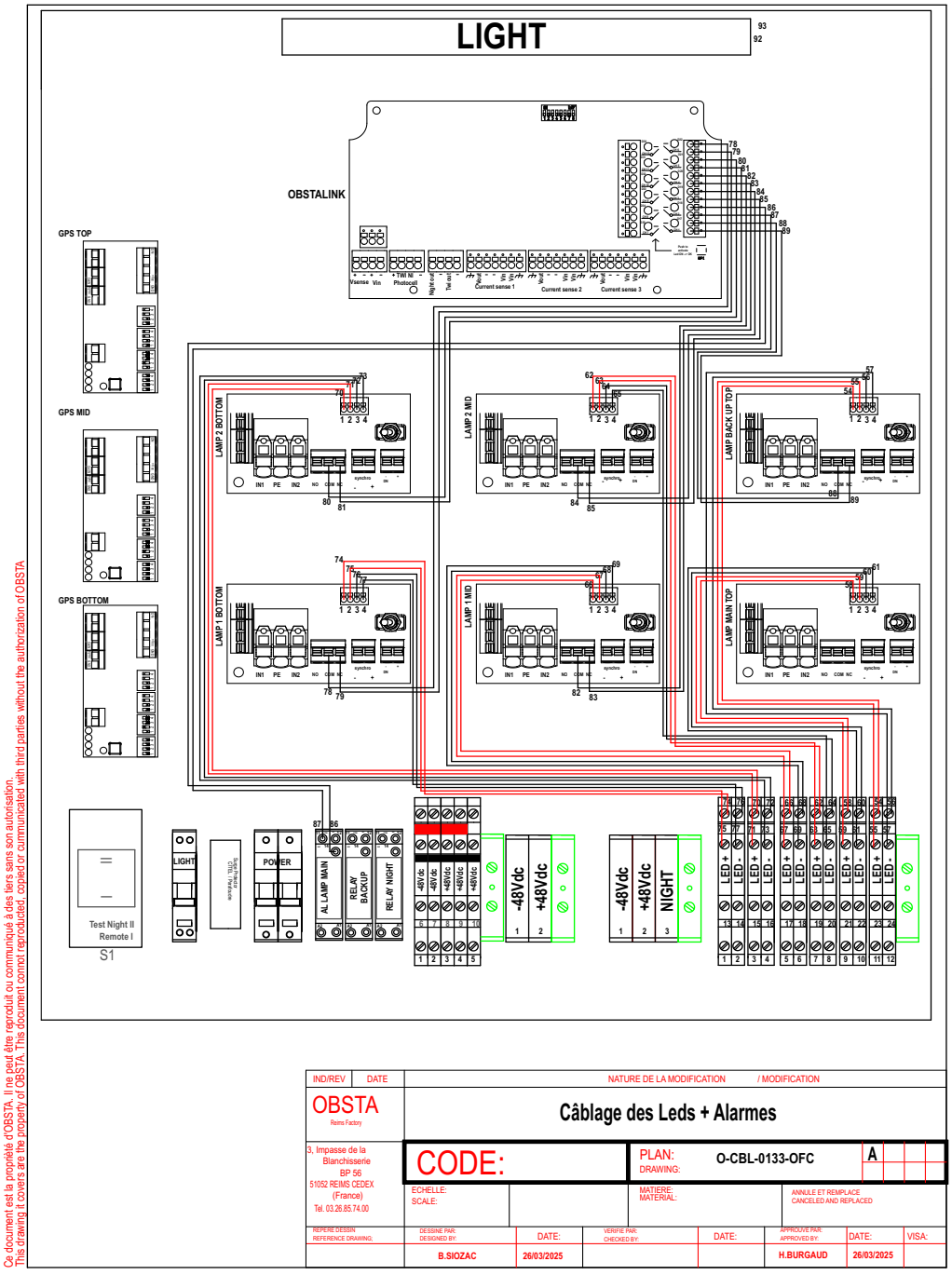


113176-048-6G



7.3.2 Internal wiring of the command cards of the alarms and the LED circuits going to flash-heads

113176-048-6G



7.4 Tools

7.4.1 Installation of the flash-heads

- Wrench of 22 — Cable glands
- Flat screwdriver 0.5x30 — Cable terminal for synchronization

7.4.2 Maintenance

Those tools come in addition to above :

- Allen wrench 2.5 — screw for latches (to change latch)
- Allen wrench 3 — screw for PCB (to change the command card)
- Allen wrench 4 — screw for shunt braid (to change the flash-head)

7.5 Checking of 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 of the wires :
  - Use wire end
  - check the power cable on the terminal connection
  - check the ground is connected on the terminal connection
  - check the synchronization cable (if used)
  - *in option, add black heat shrinking tube (or 3M scotch) on the cable glands*

- Closing the flash-head :
  - check the position of O-ring in the light body before closing the flash-head
  - check the 2 latches are correctly close

- Attachment of the light :
  - Use the 4 brackets to fix the light
  - Use locking washers (or other device) in presence of vibration
  - Use a spirit level to check the light is perfectly horizontal
  - Option « R »
    - Orientation of the light censor should be in the North

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

8 MAINTENANCE

Test	Frequency	Preventive action	Risk
Cable	Annual	It is recommended to check once a year the torque for each screw terminal to avoid loose wire and the cable glands to avoid loose of waterproof.	short-circuit insulating failure destruction
Waterproof	Annual	Visual : -No water inside - O ring position and appearance	short-circuit insulating failure destruction
Corrosion	Annual	Visual	Water inside
flash-head	Annual	Clean the glass of flash-head	Bad light output

9 TROUBLESHOOT - MALFUNCTION

9.1 Led indicators on the command cards

Some indicators (Leds) located on the top on the right of the command card in the event of alarm give a status of the light, they are identified in white :
D4 : red in case of alarm
D5 : green for led circuit 1 inside the flash-head
D6 : green for led circuit 2 inside the flash-head

D5 and D6 blinks at the same pulse than the circuit 1 and circuit 2 inside the flash-head. D4 normally blinks also at the same pulse

On the surge protection, a luminous indicator indicates the status of it ; in case this indicator is off (while input power is present), the surge protection is to be replaced

9.2 Quick trouble shooting synoptic

Default		Action
Normal operation	Green LED D5 blinks with led circuit 1 Green LED D6 blinks with led circuit 2	Ok
Power supply	Red LED D4 blinks quickly	Check the input power supply feeding the light
Synchronization	Red LED D4, sequence 1 long flash + 1 short flash flash-head at 15 flash per minute	Check the connection of synchronization wires on the command cards (both master and slave units)
GPS	Red LED D4, sequence 1 long flash + 2 short flash flash-head at 15 flash per minute	Check the status GPS (Led blinking 1 per second) and the position of its antenna
Led circuit 1 and 2	Red LED D4 + green LED of the circuit	Replace flash-head

10 SPARE PARTS

Command card for OFC-RI-048	113790RR-CMD-048
flash-head for OFC-RI-REM	113790RI-REM
GPS	113746IV2
Photocell	100757
IoT	114802

ANNEXES
Photocell & GPS short notices

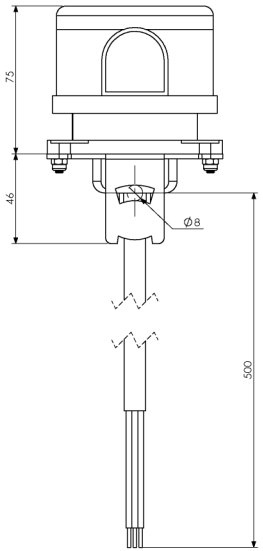
INSTALLATION INSTRUCTIONS - NOTICE D'INSTALLATION - NOTICIA DE INSTALACIÓN - INSTALLA-TIONSHINWEISE - ISTRUZIONI PER L'INSTALLAZIONE - INSTRUCOES DE INSTALACAO - MONTÁŽNÍ NÁVOD - РУКОВОДСТВО ПО МОНТАЖУ - 安装指导书

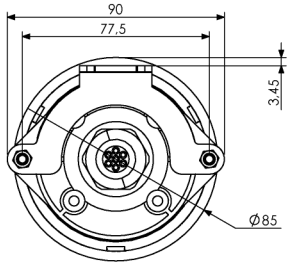
O-PRT-00013-PHO_A

	P/N	4 wires	color	max admissible Current	Ambient light intensity censor (intensité lumineuse ambiante) > 500lux Day (jour)	Between 500lux and 50lux Entre 500lux et 50lux Twilight (crépuscule)*	< 50lux Night (nuit)
Photocell DC	100757	output signals (signal de sortie)	Red wire (night signal)	2A	0V	0V	+12 to 60VDC
			Purple (twilight signal)	0,3A	0V	+12 to 60VDC	+12 to 60VDC
		input power supply (alimentation)	Black wire		+12-60VDC		
			White wire		0V		
Photocell AC	100756	output signals (signal de sortie)	Red wire (night signal)	2A	110 to 240VAC (phase)	0V	0V
			Purple (twilight signal)	0,3A	110 to 240VAC (phase)	110 to 240VAC (phase)	0V
		input power supply (alimentation)	Black wire		110 to 240VAC (phase)		
			White wire		110 to 240VAC (neutral)		

*: the twilight signal (purple wire) is normally only used for high intensity system

*: le signal crépuscule (fil violet) est normalement uniquement utilisé avec les systèmes haute intensité

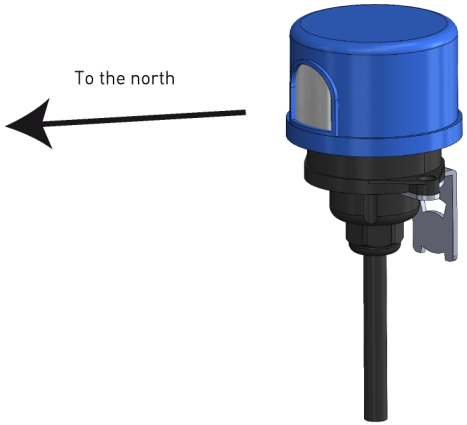




1. assembly

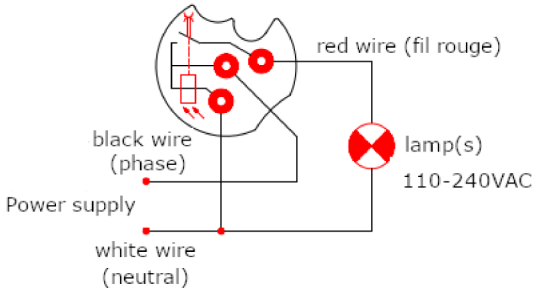
The ambient light sensor of the photocell should be mounted upright, away from artificial light (eg., floodlights), and in a location that will enable its sensor window to have an unobstructed view of the polar sky (eg., pointed north in the northern hemisphere).

La cellule photoélectrique doit être fixée verticalement, sa fenêtre éloignée de toute lumière artificielle, et orientée vers le Nord (dans l'hémisphère Nord)

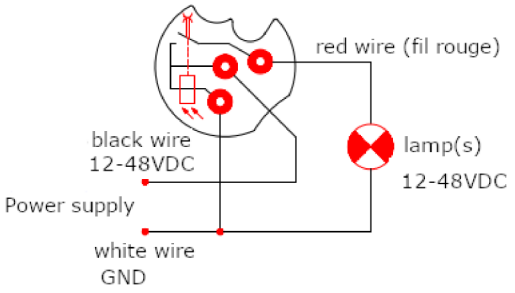


2. wiring of the photocell

Wiring of PHOTOCELL AC
Raccordement Photocell AC



Wiring of PHOTOCELL DC
Raccordement Photocell DC



- For day and night medium intensity system, the night signal only should be used and connected to the light or its the power cabinet or its controller (please refer to the dedicated manual)

- For high intensity system, both the twilight and night signals should be used and connected to the controller of the lights or the master high intensity light (please refer to the dedicated manual)

- For red lamps to operate at night only, it is also possible to use the night signal to power directly lamps with same voltage and in the limit of 2A maximum:

- Dans le cas de feu moyenne intensité diurne et nocturne, seul le signal rouge est utilisé, il est raccordé à la lampe ou son alimentation ou son contrôleur (consulter le manuel dédié à ce feu)

- Dans le cas des feux haute intensité, les 2 signaux nocturne et crépuscule sont utilisés, ils sont raccordés au feu maitre ou au contrôleur (consulter le manuel dédié à ce feu)

- Pour les lampes rouges devant fonctionner de nuit uniquement, le signal nuit (fil rouge) peut être utilisé pour alimenter directement des balises de même tension et dans la limite de 2A maximum:

1.1 Scope

This short notice provides information about the GPS interface for wireless synchronization located inside dual color or white only medium intensity OFI360 obstruction lights

1.2 General Description

The GPS is a PCB provided with a bracket fixed inside the flashhead and an external magnet antenna fixed on the base of the flashhead:

1.2 Electrical signals

It is powered in 48VDC and provides output signal(s) to the command card for the flash synchronisation (and in option the change of color and/or luminous intensity during day/night switch using either the GPS clock or a photocensor connected on it)

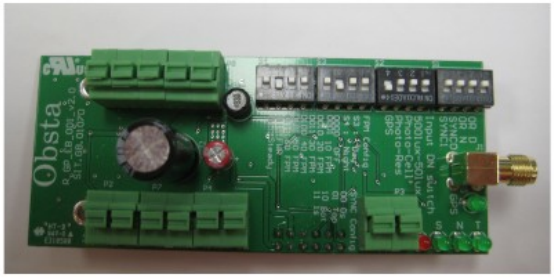
1.2.1 Input signal(s):

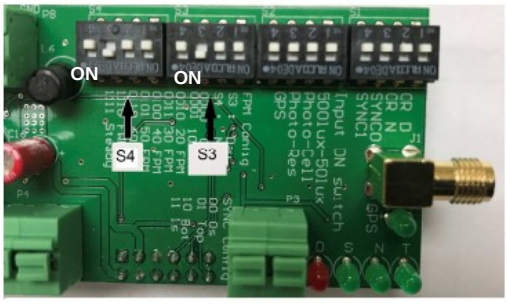
- 48Vdc power supply
- day/night signal coming from the 48Vc photocell (in case the flash rate need to be changed between day and night) or coming from a photocensor (this interface can also use the GPS clock to monitor the day/night switch)

1.2.2 Output signal(s):

- top sync
- if used, day/night signal : 0V->day mode, 48Vdc->night mode

1.3 Operation





- the green led **(GPS**) blinks: the GPS receives the signal
- the red led (**D**) and the green led (**S**) blink: the GPS is not synchronized and sends a top sync to the command card at 15 flashes per minute, if used day/night signal remains at “night time”
- the green led (**S**) blinks: The GPS is synchronized in day mode and sends a top sync to the command card as per S3 configuration (20 fl per minute in the photo)
- the green led (**S**) blinks and the leds (**N**) & (**T**) are on: the GPS is synchronized in night mode and sends a top sync to the command card as per S4 (20 fl per minute in the photo)

S3 and S4 coding:
0010 -> 20 flashes per minute
0011 -> 30 flashes per minute
0100 -> 40 flashes per minute
0101 -> 50 flashes per minute
0110 -> 60 flashes per minute

For 3 levels configuration with 0/13, 2/13 @ 10/13
Sync config is set up by level:
00 for mid level (0s of UTC clock)
01 for top level
10 for bottom level