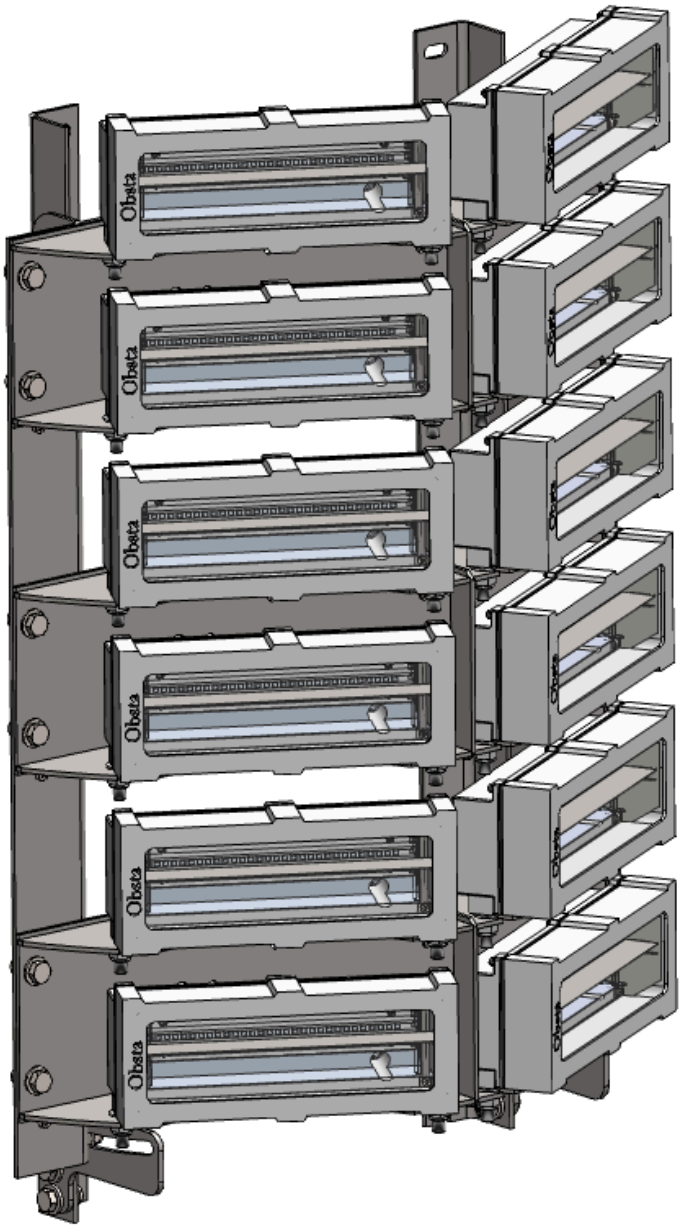
RELIABILITY IN OBSTRUCTION LIGHTING
BALISAGE AÉRIEN

OFH-120-WW-240-U // 113780U



Obsta
10108 USA Today Way, Miramar
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1. Product name and part number

Description	Part number (P/N)	Power supply	QR code
OFH-120-WW-240-U	113780U	110-240Vac	

2. Safety instructions

- 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
- 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.
- 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

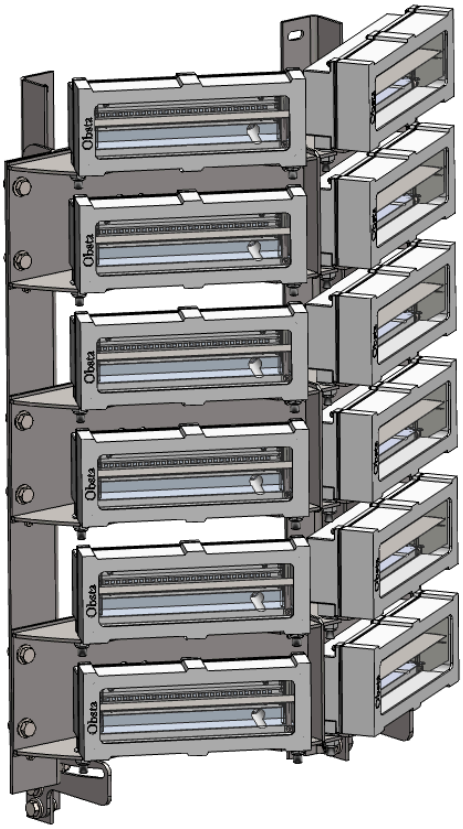
This manual provides about the installation and, operation and maintenance of the OFH-120-WW-240-U manufactured by OBSTA

4.2 General description

The OFH OBSTA is a combination of a flash head and an electrical cabinet that can produce high-intensity light by day, night and twilight.

The flash head is a combination of 12 OBSTAFLASH projectors mounted in pairs and angled at 120°. These lamps are controlled by a power cabinet. Each pair of projectors is attached to a stainless steel bracket, which is itself attached to a stainless steel structure allowing for orientation from 0 to 8°.

This manual describes the operation of the electrical cabinet and the mechanical functions of the flash head.



4.3 Technical specifications

4.3.1 Light output (white only)

Name	Parameter	Min	Nominal	Max	Unit
FL_{rate}	Flash Rate	-	40	-	FPM
B_{pat}	Beam pattern				
BP_{h}	Horizontally	-	120	-	°
BP_{v}	Vertically	-	3	-	°
BP_{ri}	Ratio Intensity 0°/ 10°	-	-	3	%
LUM_{day}	Day luminosity +- 25%	-	270 000	-	Cd
LUM_{twi}	Twilight luminosity +-25%	-	20 000	-	Cd
LUM_{night}	Night luminosity +-25%	-	2 000	-	Cd
FD_{day}	Flash duration day	-	98	-	ms
FD_{twi}	Flash duration twilight	-	98	-	ms
FD_{night}	Flash duration night	-	120	-	ms

4.3.2 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	-	50	-	Vdc
I_{rush}	Cold start inrush current	-	-	70	A
P_{avc}	Average power consumption *(with 40fpm - 100ms day mode)*	-	-	50	W

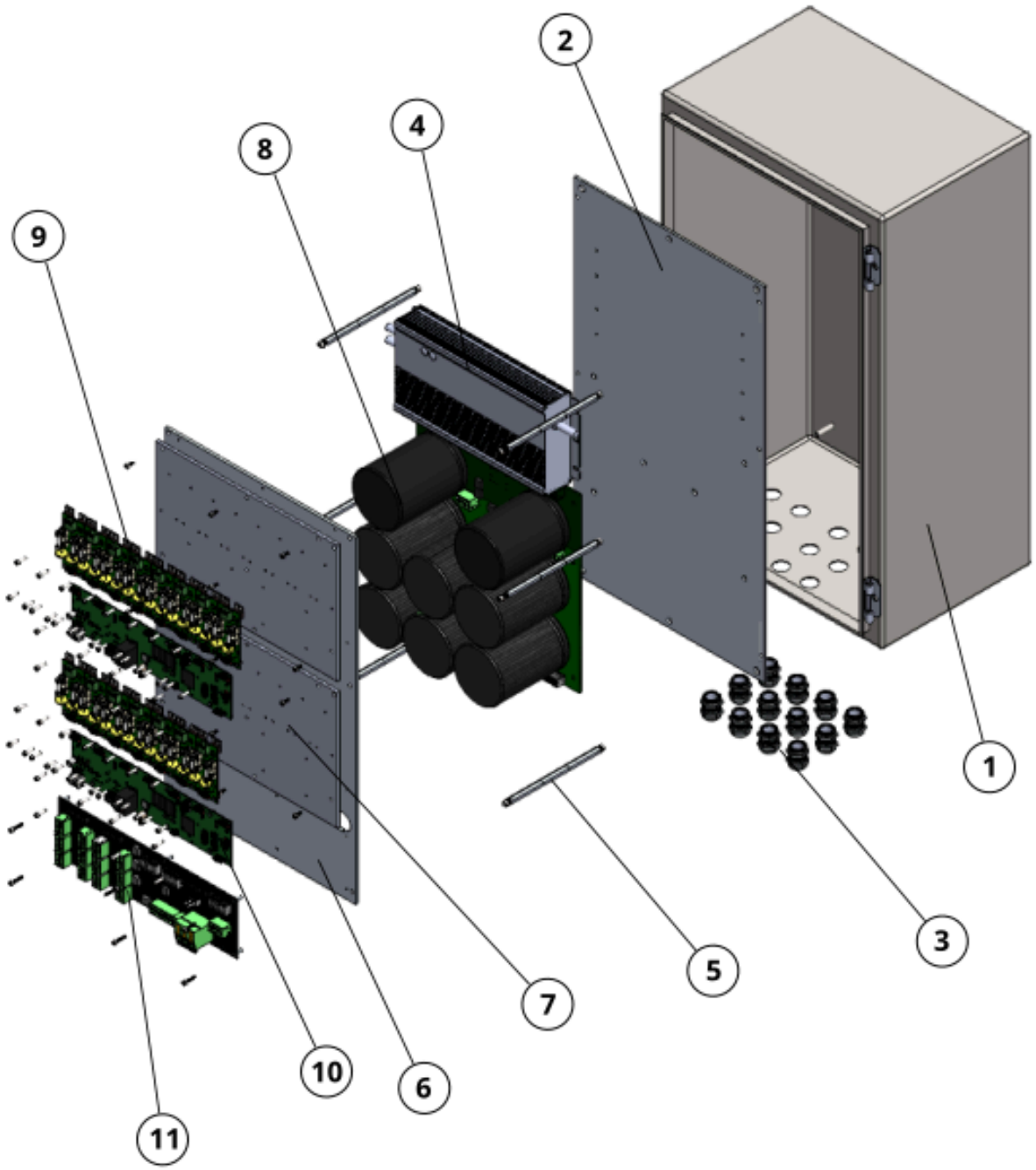
4.3.3 Operating environment

Name	Parameter	Min	Nominal	Max	Unit
$\mathbf{F_{wind}}$	Max wind force under 324 km/h (Flash-head)	-	850	-	N
$\mathbf{W_T}$	Working temperature	-40	20	55	°C
HR	Relative humidity	5	-	95	%

5. Cabinet overview

5.1 Bill of materials

The power cabinet is used to control the High intensity flash-head. With one controller you can connect up to 16 projector. There are several parts inside the controller. The internal wiring is not shown for better readability:

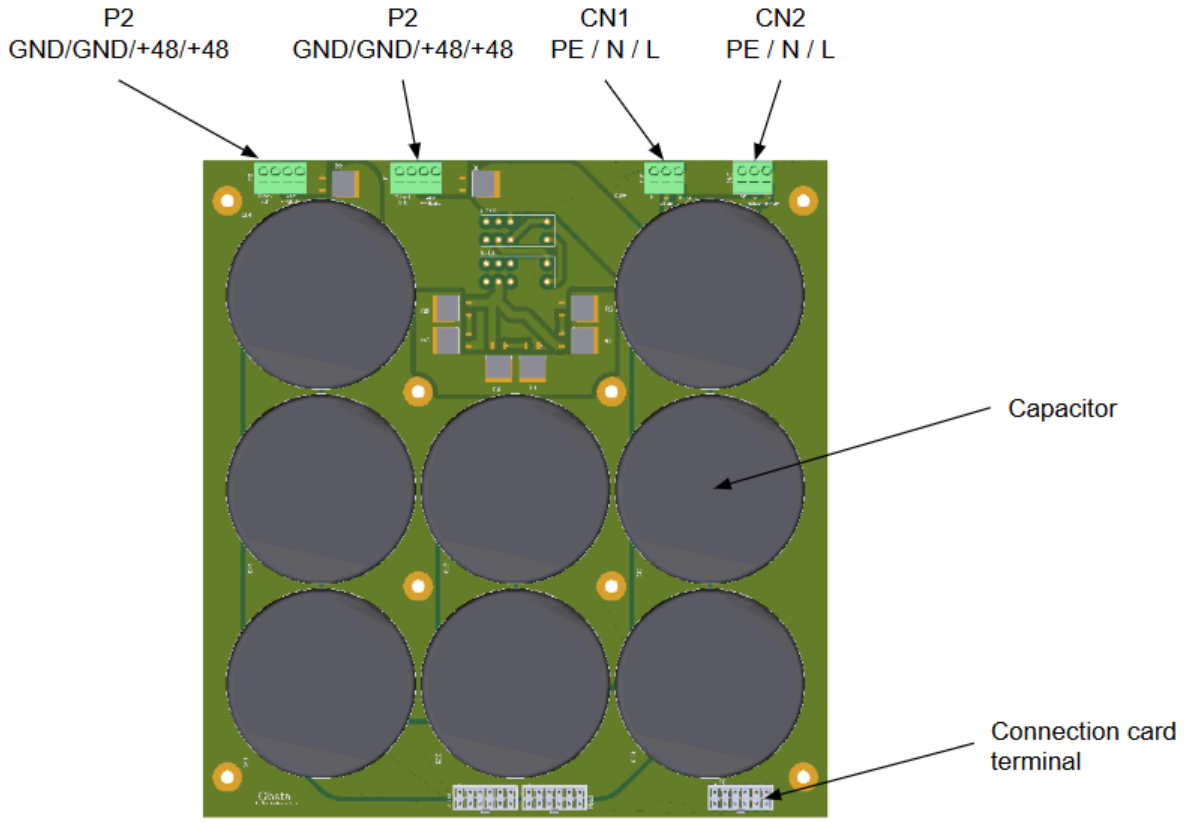


N°	Designation	Part Number (P/N)	Qty
1	590x350x250 case		1
2	Base plate		1
3	M20x1.5 cable gland		12
4	Power supply	113742-48-480	1
5	M4 column		6
6	Interior plate		1
7	PCB support plate		2
8	PCB capacitor	113748F	1
9	Power card	113741B	15
10	Command card	113744B	2
11	Connection card		1

5.2 Boards description

5.2.1 Capacitor card

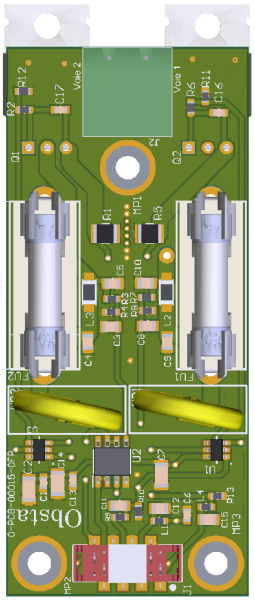
This PCB is charged with energy from the power supply and then releases it during flash.



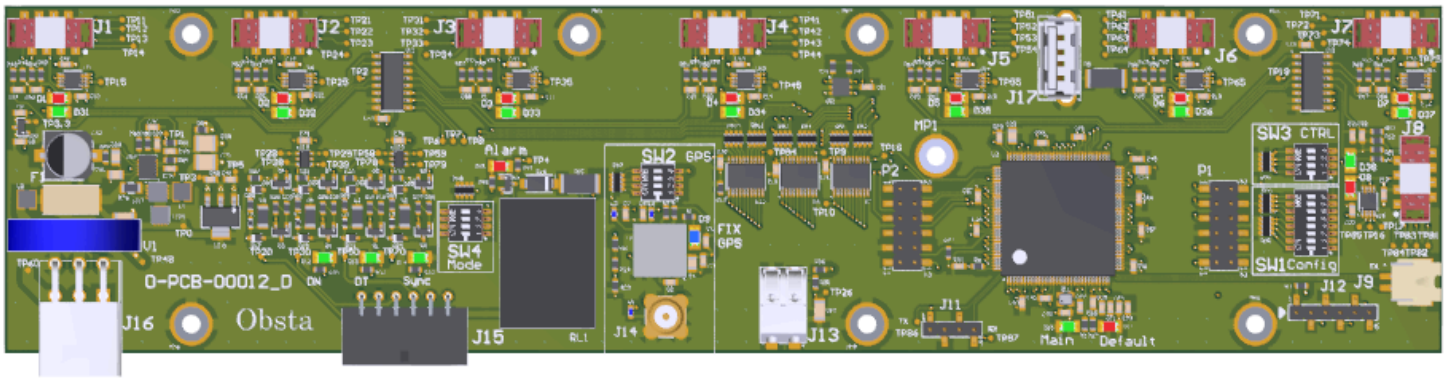
5.2.2 Power card

The cabinet includes 15 power cards. Those cards regulate the current of the 30 led circuit; 2 per PCBa (depending on the installation).

The power card drives the white led circuits inside each projector. Each card is affected by the associated projector number on the command board.



5.2.3 Command card

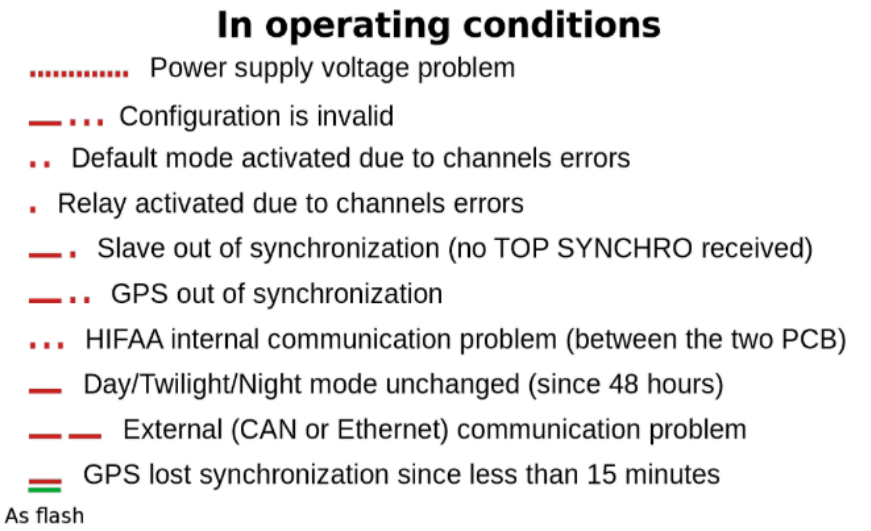


This part is responsible for managing the whole flash head. The embedded microcontroller can analyse input signals (such as GPS, various external signals) and act accordingly.

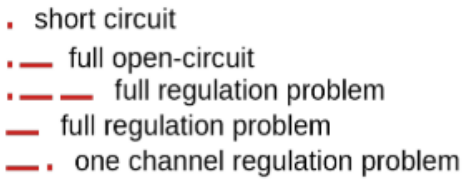
There are two control boards operating at the same time. These two cards can manage up to 16 projectors and communicate via UART. One of the two cards must be configured as a master and the other as a slave.

Power card error	Error condition	Persisted	Power card default led sequence
Short circuit	Some or all led are not working	NO	· 1 short
Open circuit 1	Both led circuit piloted by the power card are in open circuit	NO	·— 1 short and 1 long
Current regulation issue 1	Power card cannot set the according current on both circuit led	YES	·—— 1 short and 2 long
Open circuit 2	One of the two led circuit piloted by the power card is in open circuit	NO	— — Same as lamp flash
Current regulation issue 2	Power card cannot set the according current on one circuit led	YES	— —· Same as lamp flash and follow by 1 short

Operation led: 2 leds are present to inform about operation status. See default section for more information.



Power card led: 7 pairs of 2 led indicators are present to inform about the operation status of each power card (J1 to J7).



Mode led: 3 leds are present to inform about synchronization and “Mode” information
Top sync blink at each lamp flash in master configuration or at each flash request received from the controller.
DT: for twilight mode (depending on switch 4 configuration and model).
DN: for night mode (depending on switch 4 configuration and model).

Switch: They are present to allow multiple kind of operation:

- SW1: Select the topology and the associated configuration (FPM, Flash frequency, etc…)
- SW2: Set the synchronisation with GPS
- SW3: Control (lamp ON/OFF, master slave …)
- SW4: Set switch sensor is used for mode change (Day, Twilight, Night)

For more information about switches see the dedicated section.

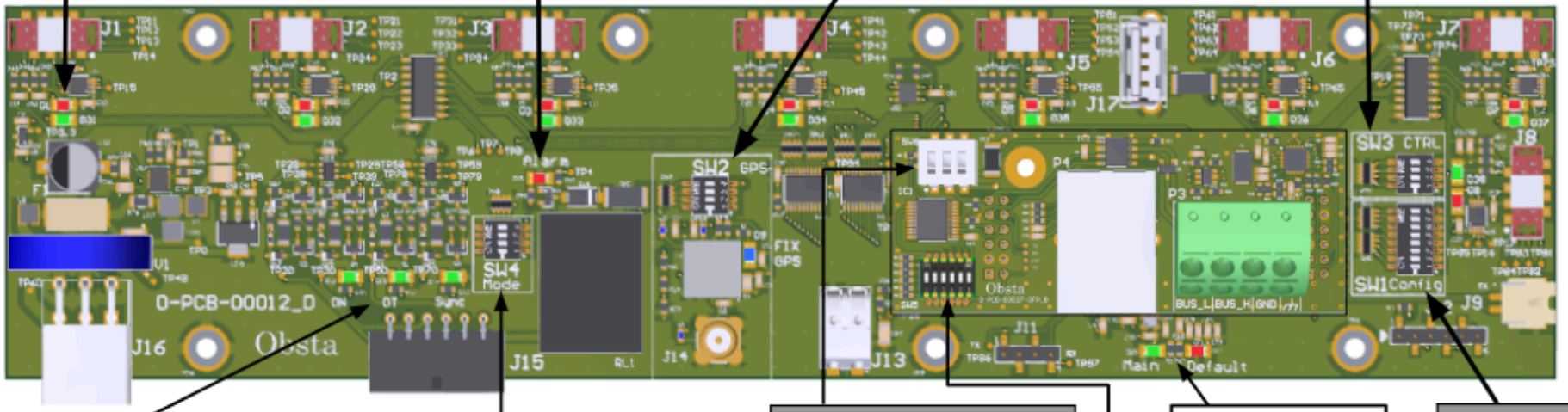
Power card led:
Red led: blinking if default on channel(s)
Green led: On when channel(s) is flashing

*same for J1 to J7

Alarm red: ON if relay is OFF (relay OFF means COM and NO connected)

SW2 - GPS				
	1	2	3	4
ON	GPS ON	GPS Sync bit 0 set	GPS Sync bit 1 set	FAA
OFF	GPS OFF	GPS Sync bit 0 cleared	GPS Sync bit 1 cleared	-

SW3 - GENERAL				
	1	2	3	4
ON	Nominal	Master	Override day	Override night
OFF	Reset	Slave	-	-



Mode led:
DN led: ON if DN input is set
DT led: ON if DT input is set
SYNC led: ON if SYNC input or output is set

SW4 - MODE				
	1	2	3	4
ON	Photores ON	Photocell ON	DT/N from GPS ON	Relay ON
OFF	-	-	-	-

SW6 - ENABLE			
	1	2	3
ON	CAN bus	Ethernet	CAN terminal resistor
OFF	-	-	-

Operation led:
Default led: plays a sequence if general default condition
Main led: ON during flash

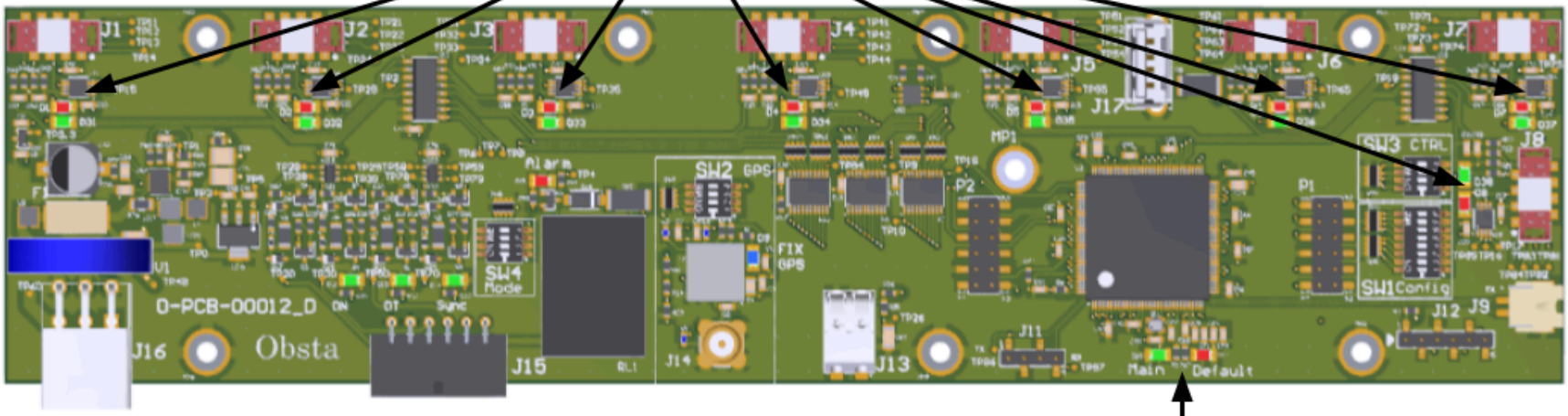
SW1 - Config	
	1 - 8
ON	Config number
OFF	-

SW5 - CAN_ID					
	1	2	3	4	5
ON	Bit 0 set	Bit 1 set	Bit 2 set	Bit 3 set	Bit 4 set
OFF	Bit 0 clean	Bit 1 clean	Bit 2 clean	Bit 3 clean	Bit 4 clean

Errors when starting up the card

The following cases appear when the card is started up, when the configuration is incomplete, and prevent the program from running. All the red leds on the power cards:

- Flash at the same time if the programme is for production and the series number has not been programmed.
- Light up one after the other if Ethernet is enabled but the IP address has not been configured.



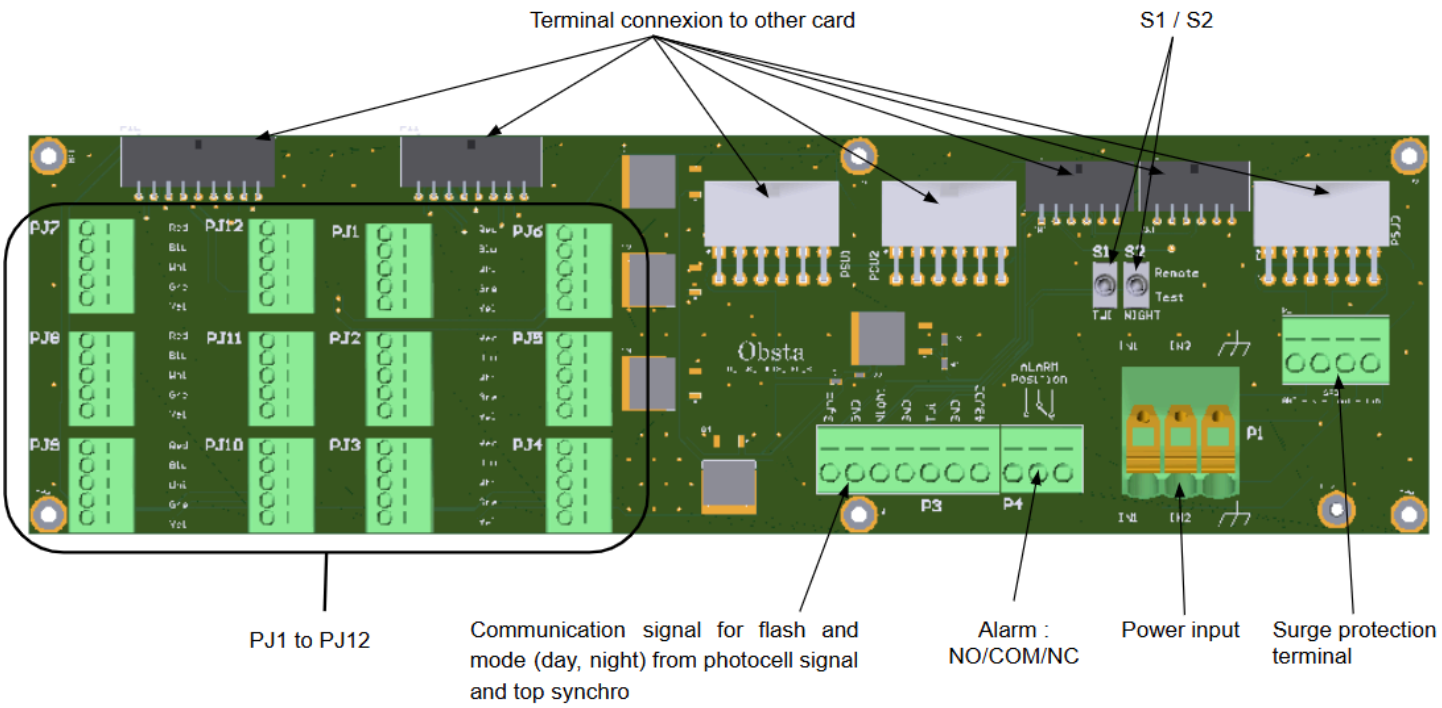
During a firmware update via USB → IP address configuration

- The copy of the logs onto a USB key went well
- The new software was copied to the card successfully
- Alternating * and * (x12) The IP configuration was correctly done

Possible error sequence

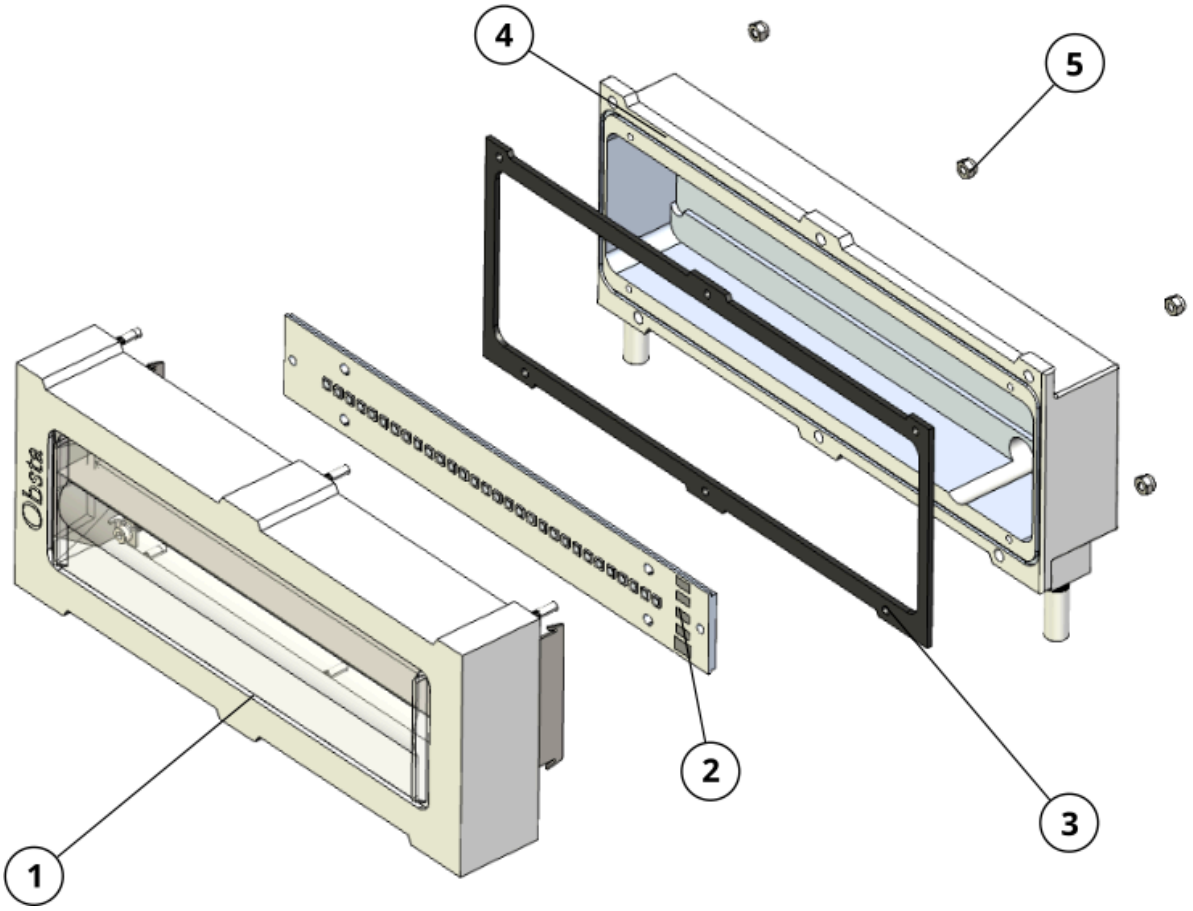
- —·— Error mounting the file system
- ——·· Error in the format of the ip.cfg file
- · Empty USB key
- —· Error opening MI.bin file
- —·· Error while waiting for write access to flash memory
- —··· Error during MI.bin file reading (Input/output error or invalid file size)
- ·— Error decrypting the MI.bin file
- ··— Error writing MI.bin file to flash memory
- ···— CRC incorrect (this error may be caused by an incorrect encryption key).
- ·· Error during mi_log.bin file encryption
- ··· Error when writing the mi_log.bin file
- — Error when unmounting the file system (this event is reported AFTER the USB key has been removed, for 10sec)
- —— Error processing USB events: unexpected event

5.2.4 Interconnection card



PJ1 to PJ12 / Projector connector must be connected according to the cable color or number. Other harnesses are cabled directly from the factory. Do not modify the cabling without Obsta's direct consent.
S1/ Test switch for twilight. Manual force the signal to twilight (Must be always in remote position for normal operation)
S2/ Test switch for day/night. Manually force the signal to day/night (Must be always in remote position for normal operation).

6. Flash-head overview

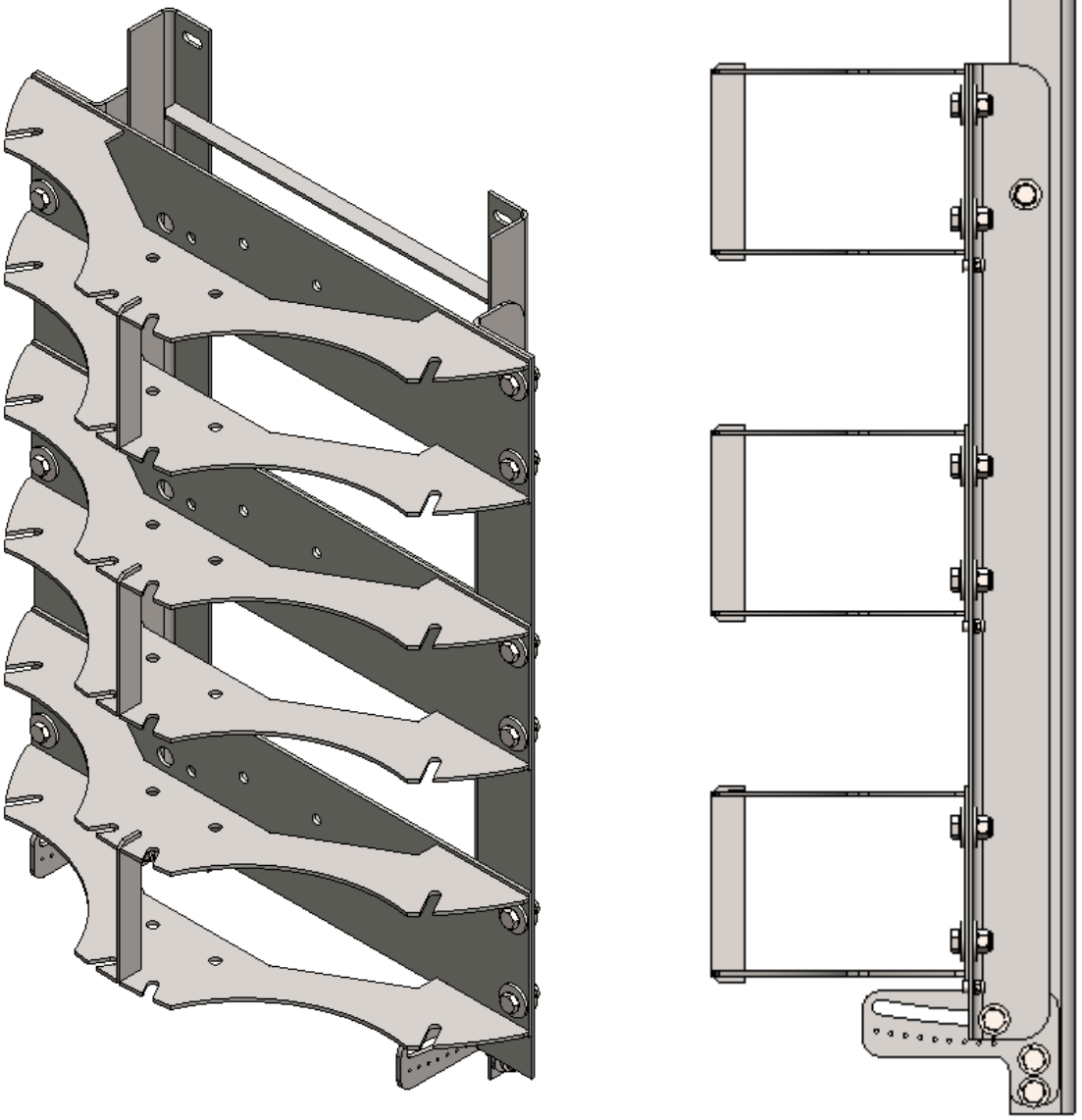


N°	Designation	Qty
1	FAA long lid	1
2	Led PCB	1
3	EPDM gasket	1
4	Bottom box	1
5	M3 lock nut	6

The OBSTAFLASH OFH is made up of 12 (6x6) spotlights angled at 120°.

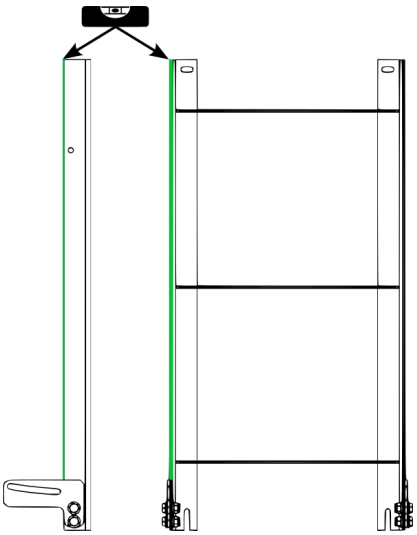
7. Bracket

7.1 Overview



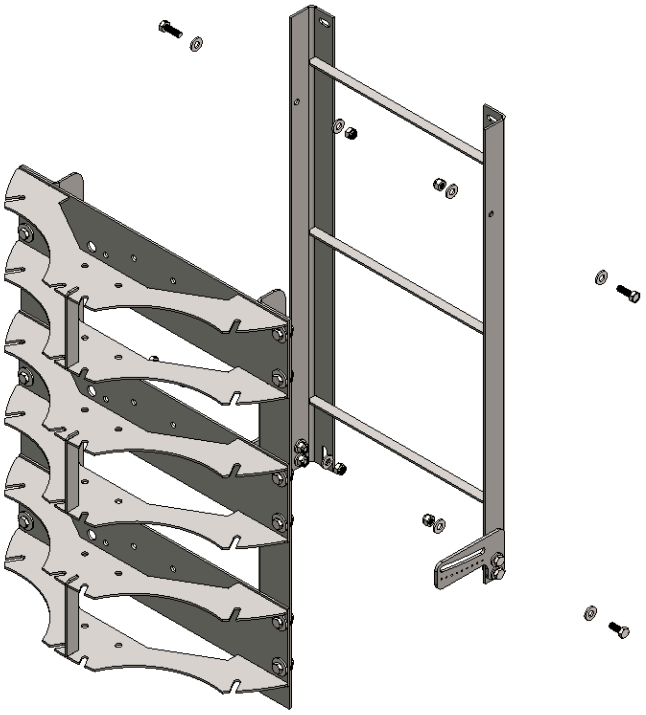
7.2 Mounting

7.2.1 Tilting bracket leveling



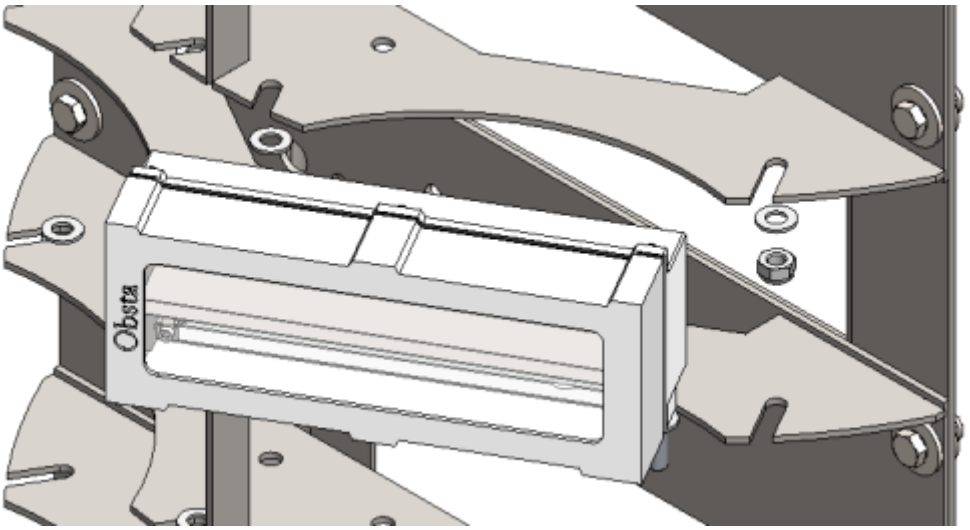
7.2.2 OBSTAFLASH bracket

The projector bracket is attached to the tilting mount using four M8x25 bolts.



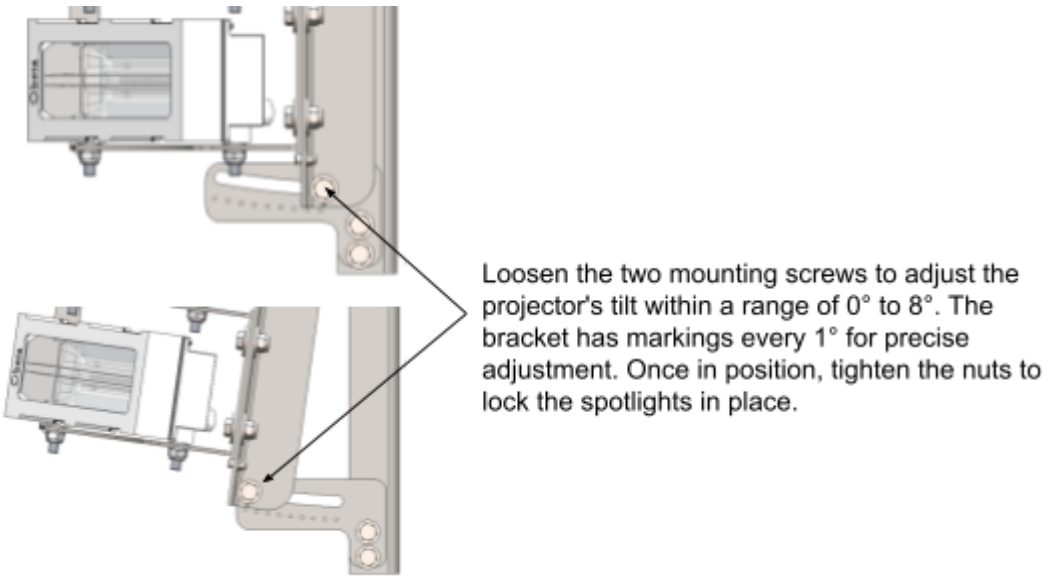
7.2.3 Projector mounting

The projector is placed in the space provided for this purpose on the bracket and secured with two M8 nuts tightened to 5 Nm.



7.2.4 Tilt adjustment

The OFH support can be tilted (0° to 8°). Reference points are provided every 1°.



8. Installation

8.1 Unpacking

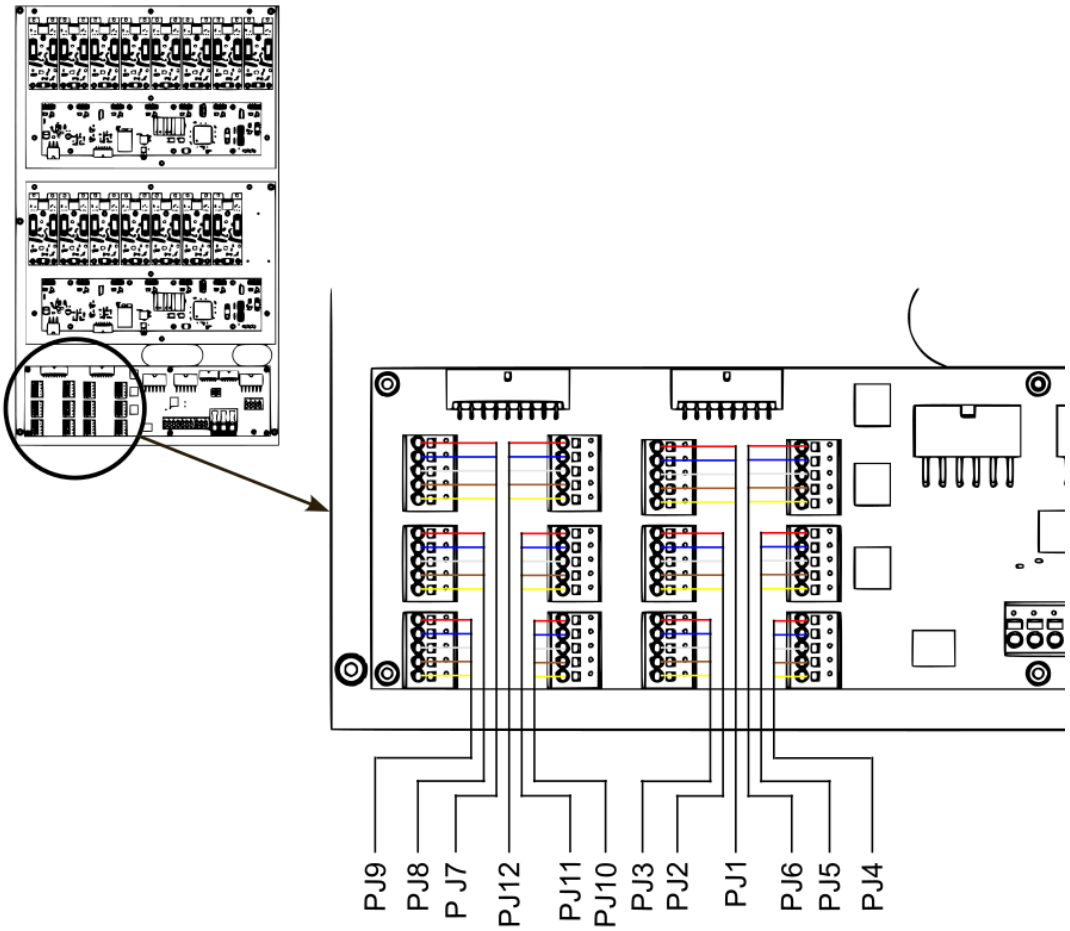
Carefully unpack each item and remove any internal packing material from the power supply and the lamp. Examine each item for obvious physical damage. Report any claims to the carrier immediately.

8.2 Flash Head

For horizontal distribution, the 3 OBSTAFLASH beacons shall be mounted at 120° around the obstacle at each level on the structure on a vertical plan. It is also very important that each flash head be perfectly fixed vertically to avoid ground scatter lights.

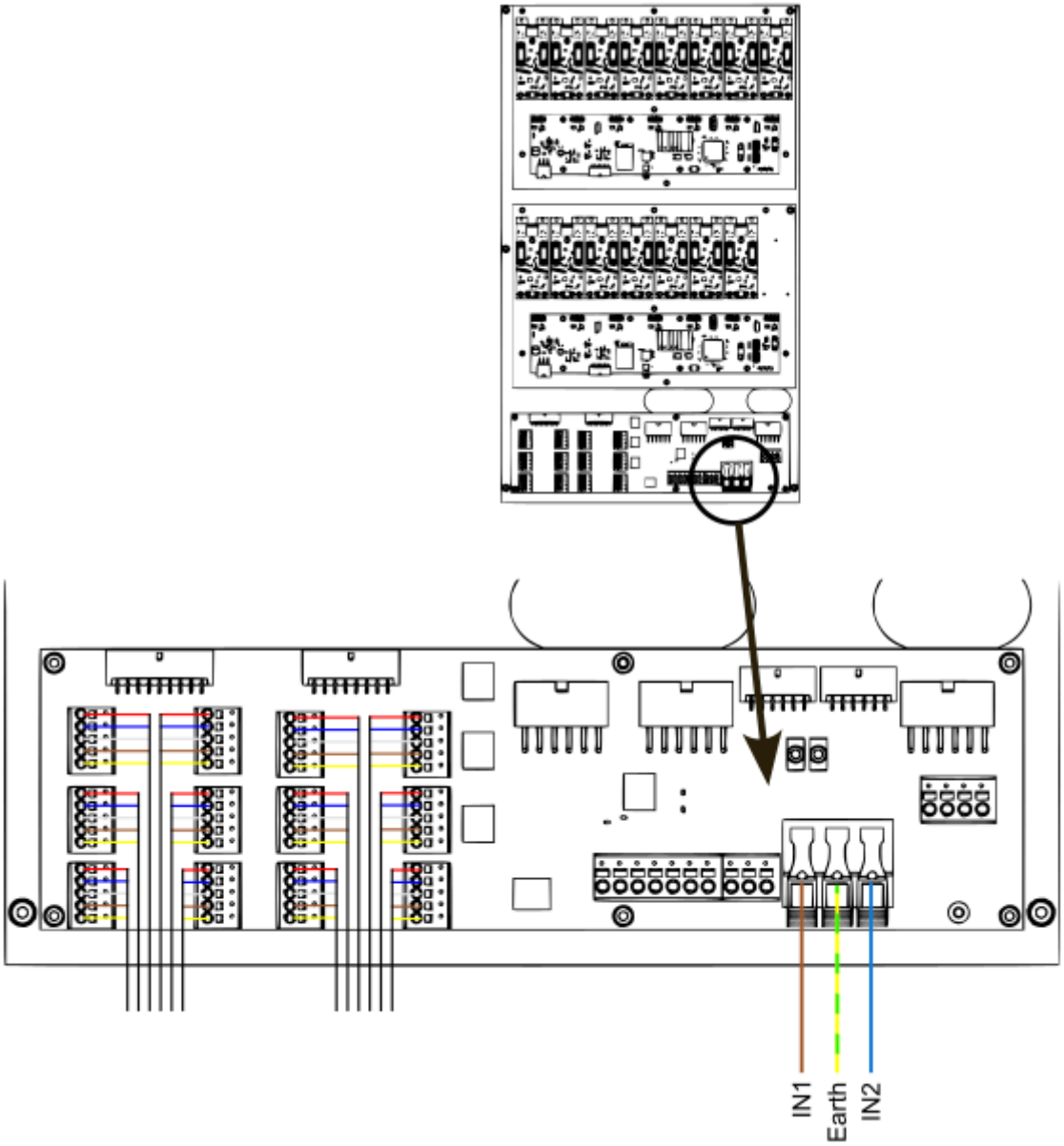
8.3 Projector connections (12 units)

The 12 projectors do have a dedicated number and shall be connected accordingly to the bottom of the power supply as per below :



8.4 AC power supply connection

Inside the power cabinet, connect the 110 - 240 VAC (Ground, Neutral and Lane) on the terminal connection (as per below):



8.5 ON/OFF switch operation

WARNING :

- **After 110-240Vac is switched ON, wait 15 seconds to start the Day or Twilight mode.**
- **After 110-240Vac is switched OFF, set the night mode and wait 15 seconds before switching ON again.**

Day / Twilight / Night mode (DTN mode):

The change to DTN mode is done through the switch S1 and S2. The “remote position” is unassigned and should not be used.

	S1	**S2**
Day mode is forced	NC	NC
Twilight mode is forced	Test	NC
Night mode is forced*	NC	Test

*If night mode is forced, twilight mode is ignored.

9. Maintenance

9.1 Annual inspection

Test	Frequency	Action	Sanction	Solution
Cable	Annual	- Tighten power card connector's screw - Tighten projector's connector plugged on the PSU		
Waterproof	Annual	Visual	No water inside	Search the water leak
Corrosion	Annual	Visual	No excessive corrosion	Replace defective part
Power supply	Annual	Visual	Led status indicator	Replace the defect part if necessary
Led projector	Annual	Clean with humid cloth the glass of each projector		

9.2 Preventive maintenance

Every 3 years → Replace de Capacitor PCB (P/N: 113748F)

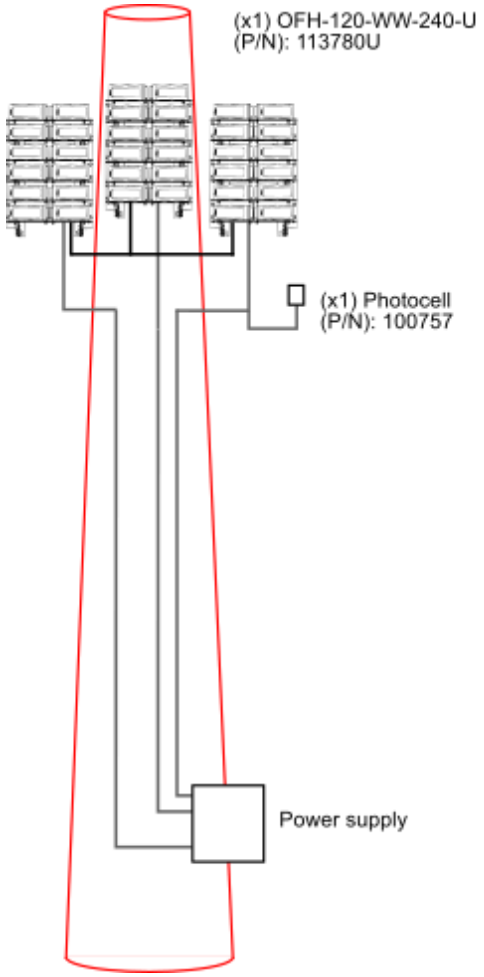
9.3 Spare Parts

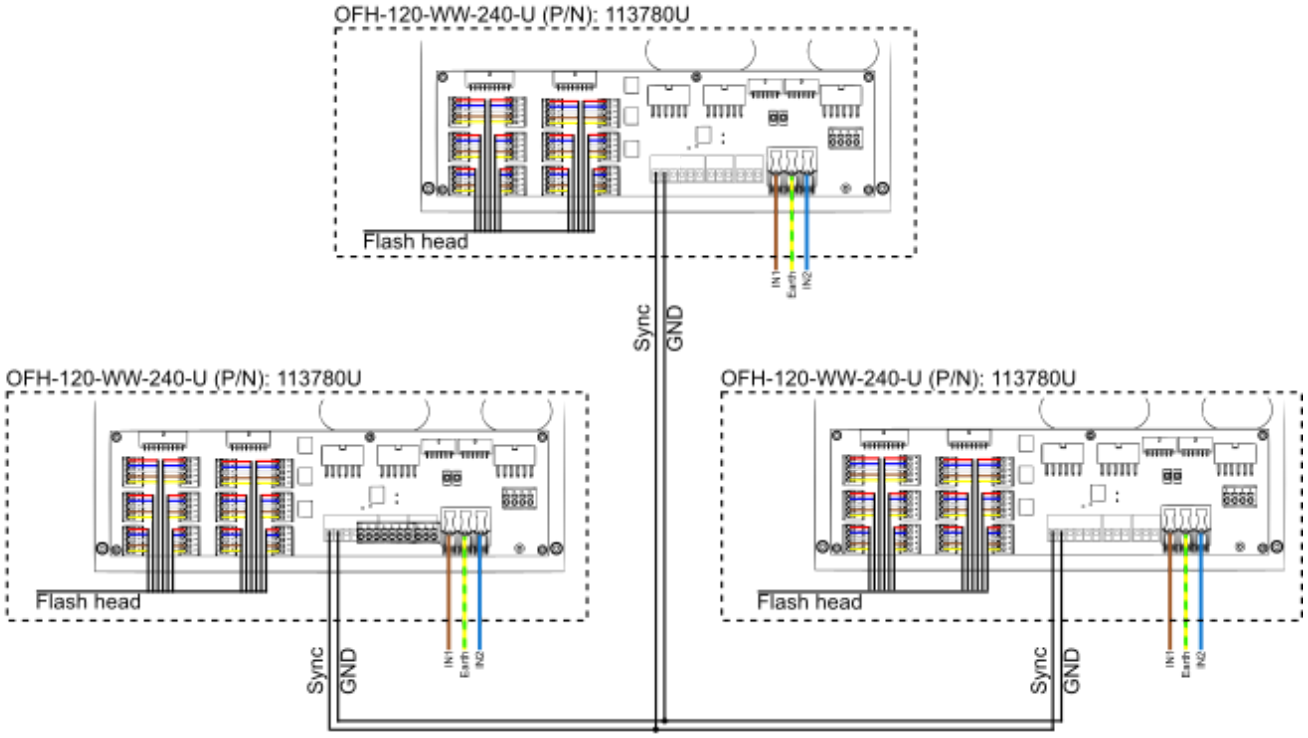
Command Card	P/N: 113744B
Power Card	P/N: 113741B
Capacitor PCB	P/N: 113748F
Harnesses Kit	P/N: 113760C
Photocell	P/N: 100757
SPD	P/N: MLPX-240Vac
Power Supply (AC/DC Converter)	P/N: 113742-48-480
Projector	P/N: 13764UDSD

10. Typical wiring diagrams

- Page 26:Typical wiring with Typical wiring of three OFHs connected by a synchronization cable.
- Page 27:Typical wiring for a chimney equipped with two 4 OFH stages and a CAN controller.

Typical wiring with Typical wiring of three OFHs connected by a synchronization cable.





Typical wiring for a chimney equipped with two 4 OFH stages and a CAN controller.