OBSTA CONTROLLER V1.1

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1 BE CAREFUL

1.1 Warning

1 Read all document pages before powering up the beacon
2 Any intervention must be carried out by accredited and trained personnel

1.2 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.

1.3 Notice

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2 GENERAL INFORMATION

2.1 Scope

This manual provides information about the configuration and operation of the controller OFH-CTR-CAN used to control white or dual color OBSTA Led High Intensity and Medium Intensity Obstruction Lighting Systems manufactured by OBSTA.

2.2 General Description

This controller allows the maintenance, the configuration, the installation and the administration up to 64 white or dual color medium or high intensity OFH series obstruction lights through one unique control cable shielded 3x0,5mm2

Main characteristics

- stainless steel enclosure grade 316L
- large touch screen
- status and telemetric, humidity and temperature of each obstruction light connected on the controller through the control cable
- alarm threshold settings
- GPS for wireless synchronisation and time setting
- surge protection
- connection of an external photocell for day/twilight/night
- Web monitoring on Obsta server via MQTT (over ethernet or GSM modem)
- Modbus TCP monitoring (over ethernet).
- automatic mail notification
- external wireless 4G, LTE (2G 3G capable) modem with SIM card in option

2.3 Controller overview

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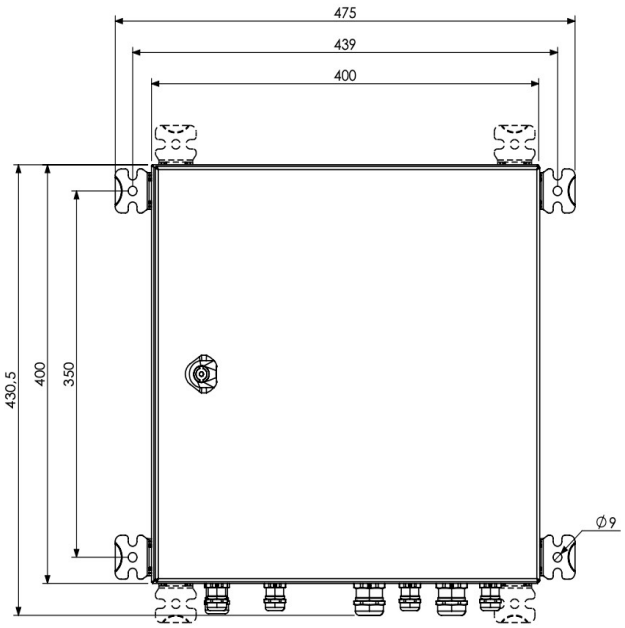

Figure 1 : Cabinet overview

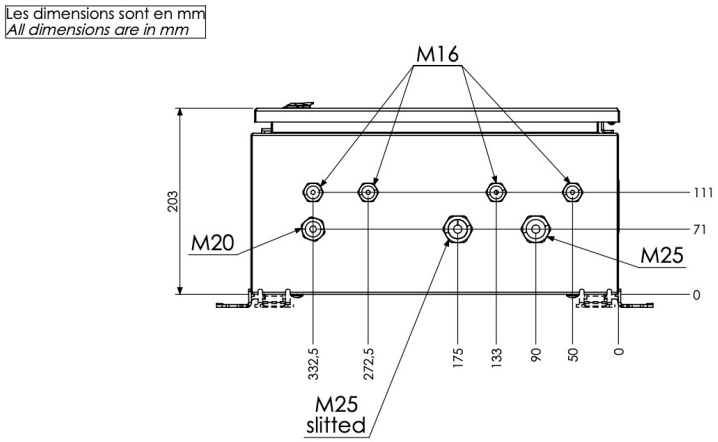

Figure 2 : Cable entries

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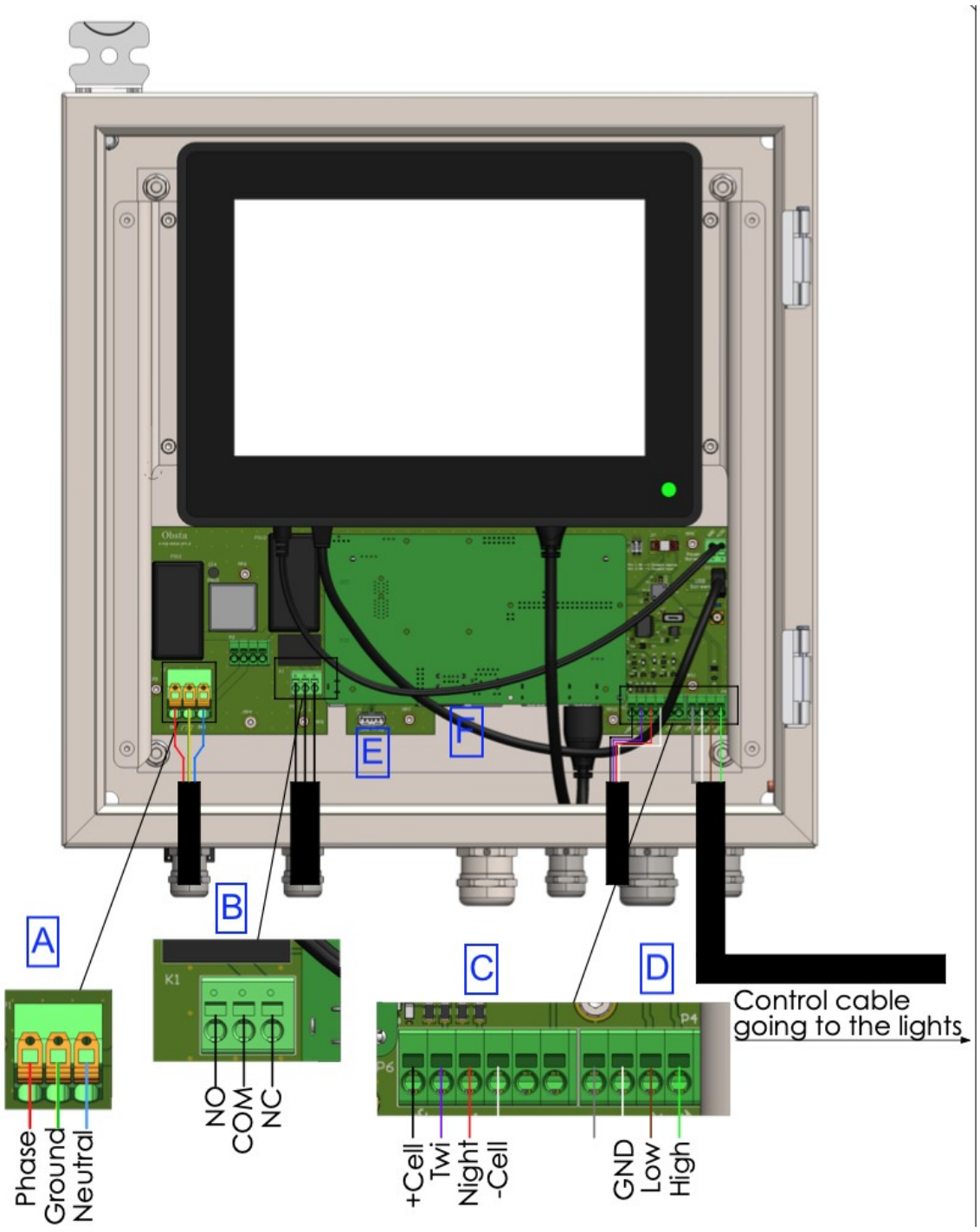

Figure 3 : View inside the controller

A: 110-240VAC power cable; **B**: Normally open and normally close relay; **C**: Photocell

D: Control cable going to the lights

E: USB connector (for optional external GSM modem), **F:** RJ45 connector (for optional internet)

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100757/113946	
100757	113946
Black	P2-1
Red	P2-2
White	P2-3
Purple	P2-4

Photocell DC
P/N 100757

SWITCH 114113 N°1 À 6

SW1	
1	OFF
2	OFF
3	OFF
4	OFF
5	ON
6	OFF
7	OFF
8	OFF

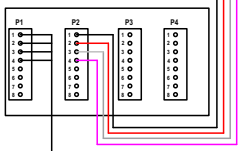
SW2	
1	OFF
2	OFF
3	OFF
4	OFF

SW4	
1	OFF
2	OFF
3	OFF
4	OFF

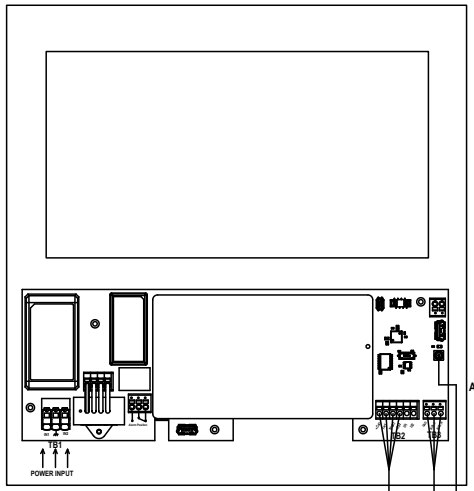
SW3	
1	ON
2	OFF
3	OFF
4	OFF

SW6	
1	ON
2	OFF
3	OFF

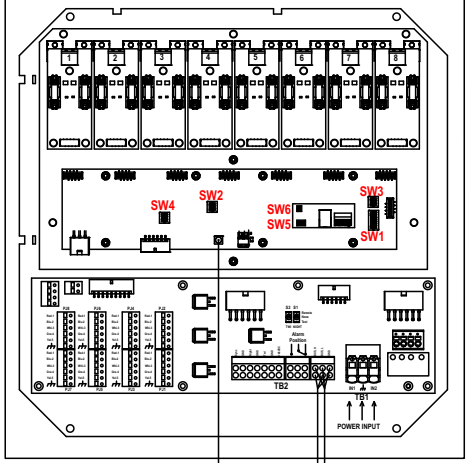
NAV-JB-8
P/N 113946



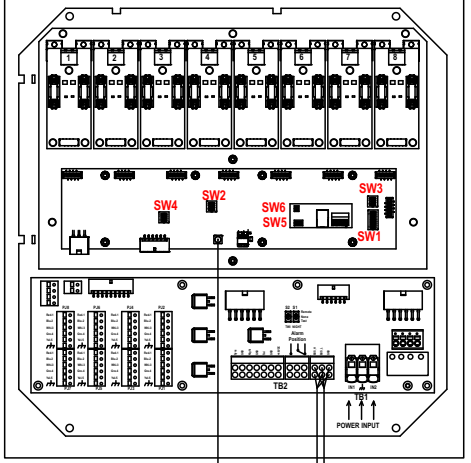
OFH-CTR
P/N: 113625LA



OFP-CAB-1B-RW-240-8M16-S
P/N: 114113
N°1



OFP-CAB-1B-RW-240-8M16-S
P/N: 114113
N°2



Antena GPS Antena GPS

Antena GPS

114113 N°3
O-CUS-00529A-OFH

113946/113625LA	
113946	113625LA
P1-1	+Cell
P1-2	Night
P1-3	-Cell
P1-4	Twi

113625LA/114113 N°1	
113625LA	114113 N°1
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

114113 N°1 / 114113 N°2	
114113 N°1	114113 N°2
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

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IND/REV | DATE | NATURE DE LA MODIFICATION / MODIFICATION

OBSTA
Reims Factory
3, Impasse de la Blanchisserie
BP 56
51052 REIMS CEDEX
(France)
Tel. 03.26.85.74.00

Lighting System Installation

CODE:

PLAN: O-CUS-00528-OFH
DRAWING:

A

ECHELLE: SCALE:
MATIERE: MATERIAL:
ANNULE ET REMPLACE CANCELED AND REPLACED

REPERE DESSIN REFERENCE DRAWING:	DESSINE PAR: DESIGNED BY:	DATE:	VERIFIE PAR: CHECKED BY:	DATE:	APPROUVE PAR: APPROVED BY:	DATE:	VISA:
	B.SIOZAC	13/11/2023			H.BURGAUD	13/11/2023	

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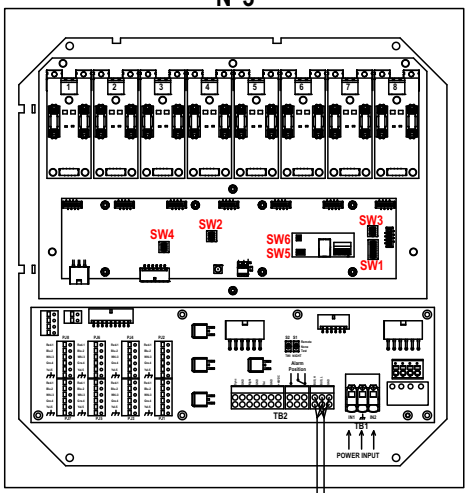
OFP-CAB-1B-RW-240-8M16-S
P/N: 114113
N°3



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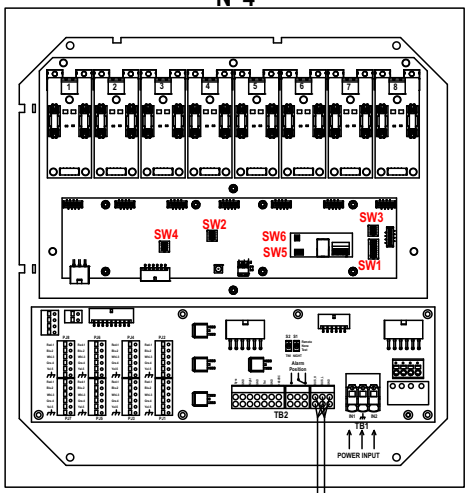
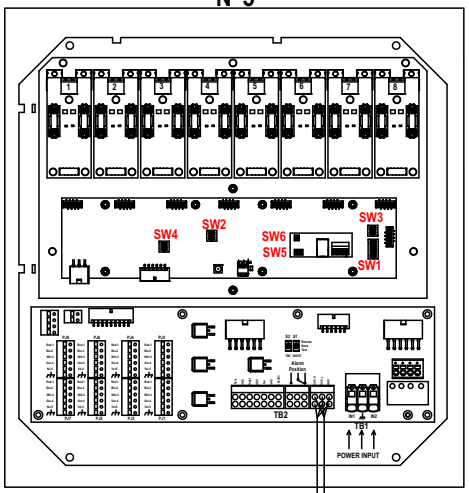
P/N: 114113
N°4



OFP-CAB-1B-RW-240-8M16-S
P/N: 114113
N°5



114113 N°2
O-CUS-00528A-OFH

114113 N°6
O-CUS-00530A-OFI

114113 N°2 /114113 N°3

114113 N°2	114113 N°3
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

114113 N°3 / 114113 N°4

114113 N°3	114113 N°4
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

114113 N°3 / 114113 N°4

114113 N°3	114113 N°4
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

114113 N°4 / 114113 N°5

114113 N°4	114113 N°5
GND	GND
BUS_L	BUS_L
BUS_H	BUS_H

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51052 REIMS CEDEX
(France)
Tel. 03.26.85.74.00

Lighting System Installation

CODE:

PLAN: O-CUS-00529-OFH
DRAWING:

A

ECHELLE: SCALE:

MATIERE: MATERIAL:

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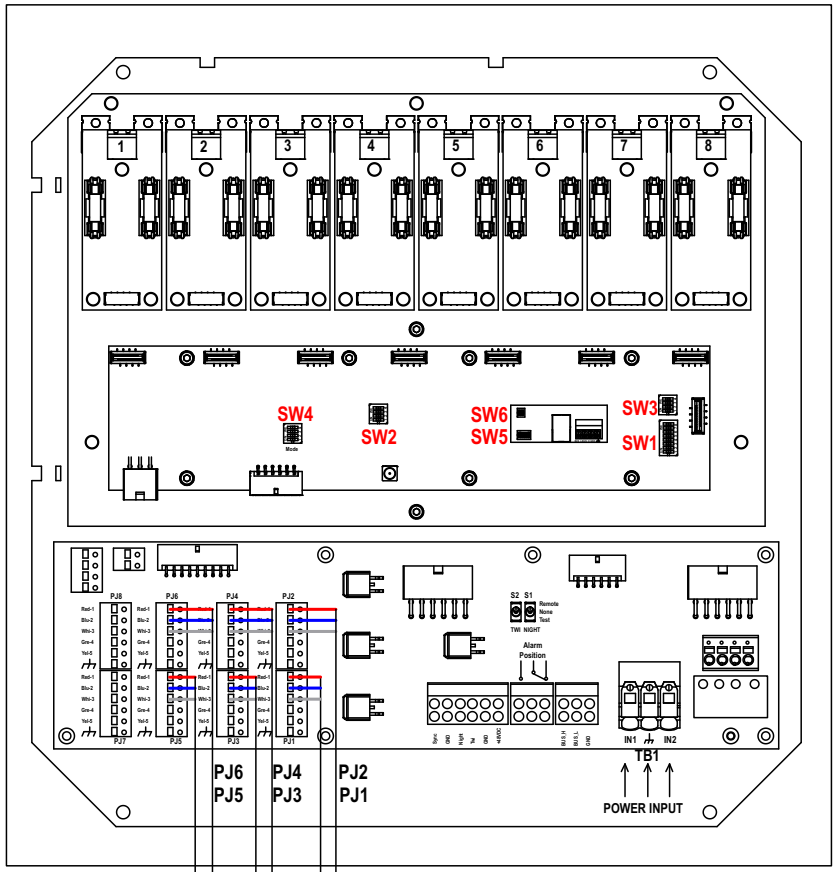
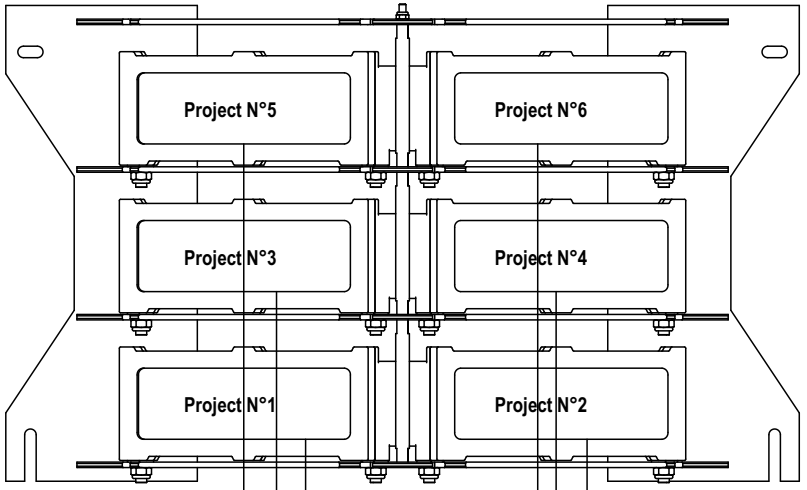
OFP-CAB-1B-RW-240-8M16-S
P/N: 114113



OFP-FH-RW-120-6PJ
P/N: 114601



PJ5
PJ6
PJ3
PJ1
PJ4
PJ2

IND/REV	DATE	NATURE DE LA MODIFICATION / MODIFICATION

OBSTA
Reims Factory

3, Impasse de la Blanchisserie
BP 56
51052 REIMS CEDEX
(France)
Tel. 03.26.85.74.00

Ligthing System Insallation

CODE:

PLAN: O-CUS-00531-OFH
DRAWING:

A

ECHELLE: SCALE:

MATIERE: MATERIAL:

ANNULE ET REMPLACE
CANCELED AND REPLACED

REPERE DESSIN REFERENCE DRAWING:	DESSINE PAR: DESIGNED BY:	DATE:	VERIFIE PAR: CHECKED BY:	DATE:	APPROUVE PAR: APPROVED BY:	DATE:	VISA:
	B.SIOZAC	14/11/2023			H.BURGAUD	14/11/2023	

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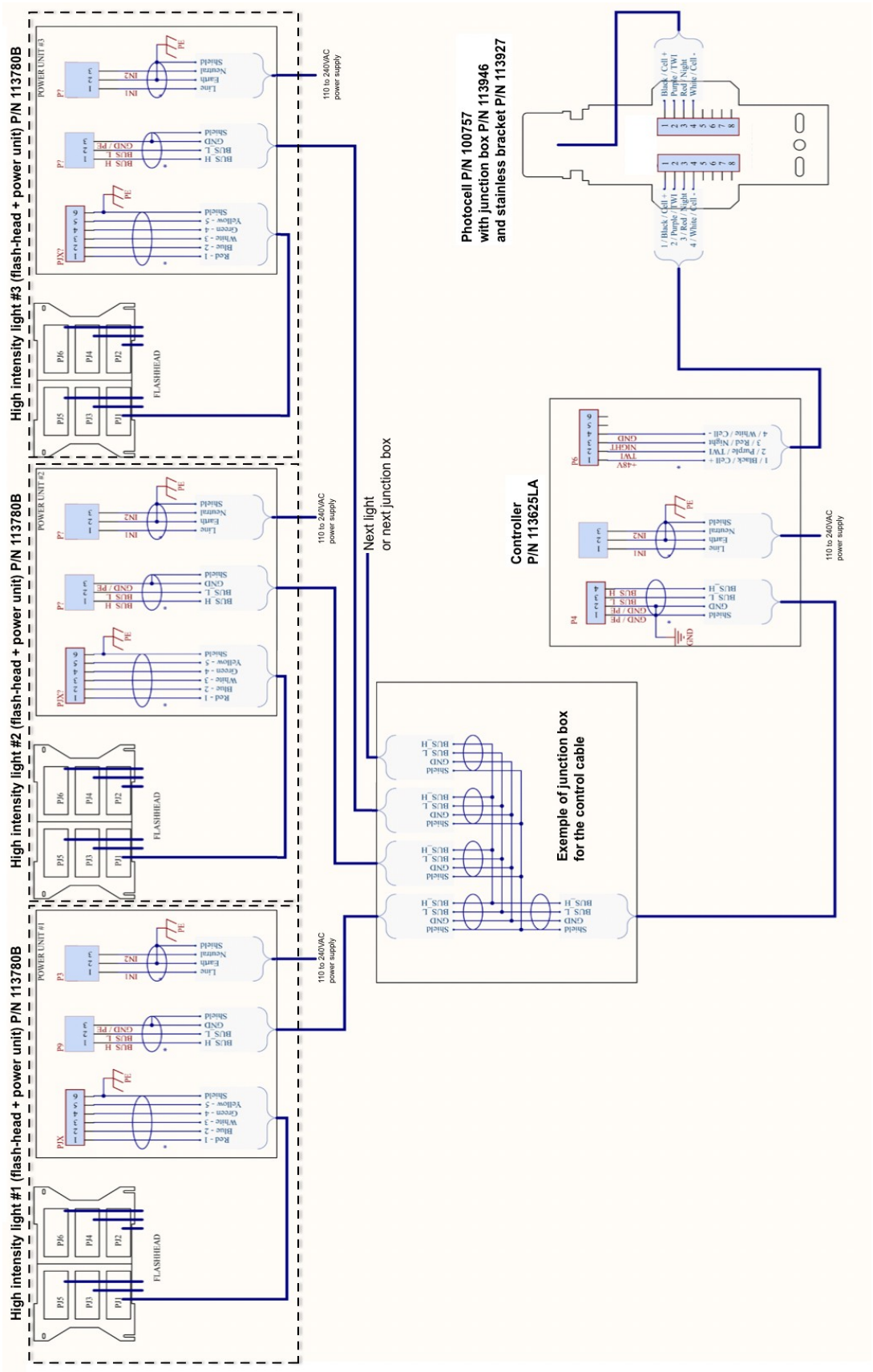

Figure 4 : Typical wiring diagram

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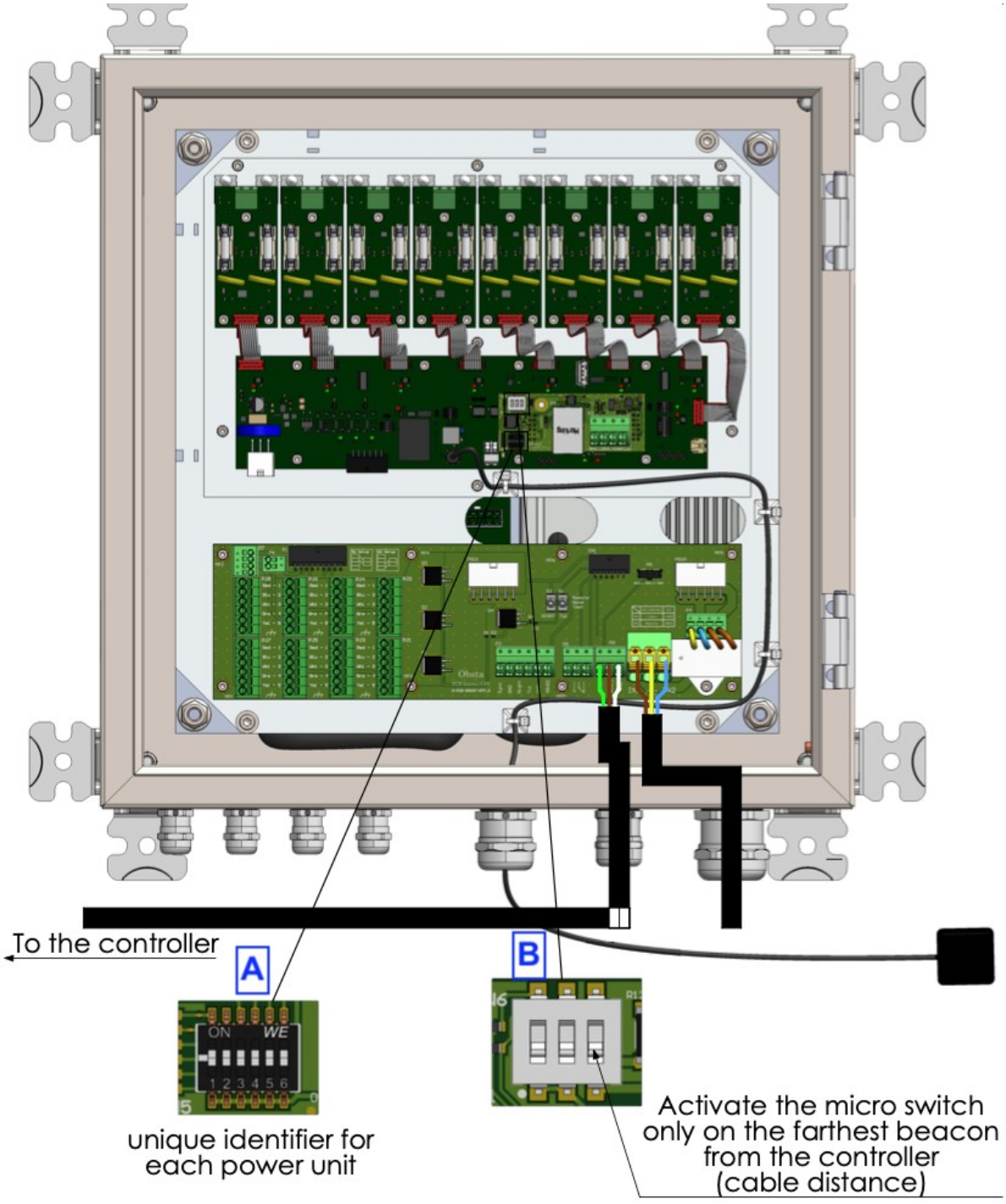

Figure 5 : Identifier of each light

A: Each light has a unique address

B: the farest light from the controller should have this dip-switch activated

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3 MECHANICAL INSTALLATION

3.1 Unpacking

Carefully unpack the controller. Examine carefully it for obvious physcal damage. Report any claims to the carrier immediately.

3.2 Mounting and preparation

Any manual intervention must be performed on a NON-POWERED product. Human an material issues could occur, inducing injury or permanent damage to the product.

3.2.1 Controller mounting

The controller must be installed in upright position with cable gland oriented to the ground in an easy access position/orientation for maintenance purpose.

3.2.2 Wiring of the controller with the lights

The obstruction lights are connected to the controller through one unique 3-cores control cable (detail B on figure 3). This control cable is going from the controller to all the lights. It must be shielded with a cross section not less than 0,5mm2.

Obsta recommends to ensure the continuity of its shield between the controller and all the lights.

As per other cables of the installation, it shall be installed in a fixed position with cable clamp not allowing any oscillation movement due to wind pressure.

In some specific case with high electromagnetic field an additional shield protection may be required to ensure proper operating. Obsta may provide or suggest additional grounding equipment. Please contact Obsta if the product may be exposed to this king of perturbation.

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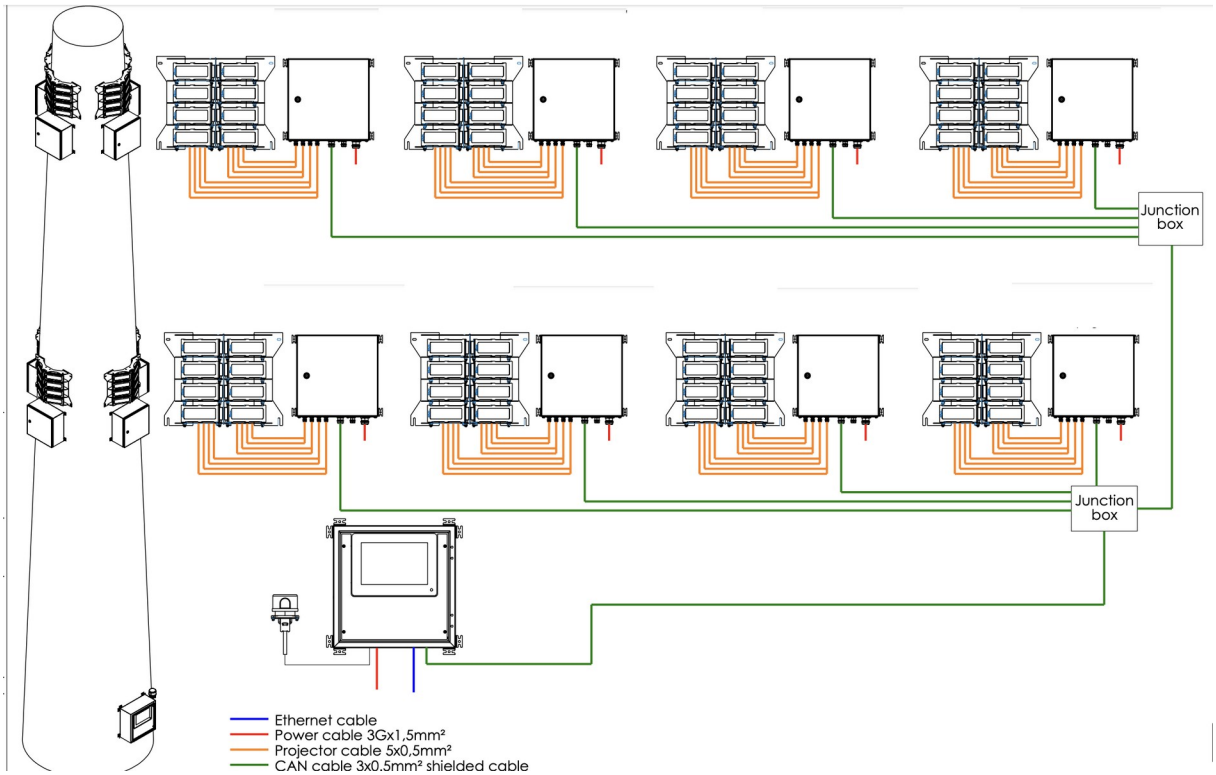

Figure 4: Example of wiring diagram with 8 high intensity lights

3.2.3 Setting aunique address for each obstruction lights

Set a unique identifer for each obstruction light using the 6 dip-switches located on the PCB on their command card located on the left of the terminal of the the control cable terminal as per figure 5

(this setting is already done in the factory)

3.2.4 Wiring of the GPS

The GPS could be used for the synchronisation of the flashes and/or the day/twilight/night change. In absence of NTP connectivity (via internet or local network), it also allows to update based on UTC clock when the controller is first energized, and set controller position (lat/lon). The magnetic antenna of the GPS should be mounted on a ferrous metallic part without an unobstructed view to the sky. This antenna comes with 5 meters cable and is connected in the jack plug inside the controller

WARNING : If the GPS is not used, we recommend to de-activated it through the menu (see paragrapg 5.4.7) to avoid intempestive alarm

3.2.5 Wiring of the photocell (figure 2.4)

If included, this ambient light sensor should be mounted upright, away from artificial light (such as 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).

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The photocell P/N100757 shall be connected to the controller using a 4 core cable (detail C on figure 3):

- the 2 wires black and white are used for the DC power supply coming from the controller

- the purple wire returns the DC in twilight time to the controller (during day time, it remains 0V)

- the red wire returns the DC in night time to the controller (during day and twilight time, it remains at 0V)

WARNING : In case the photocell is activated and its sensor do not detect change of mode for more than 48 hours, the alarm is activated. During installation period, if the time setting is changed or controller is turn off for more than 48 hours, intempestive alarm could then occur: just wait next mode change or mask the photocell with hand to reset the alarm

3.2.6 Ethernet

If local network is available, the RJ45 cable has to be plugged on the controller (position E on figure 3) and the network configuration set as per instruction (see screen..) and access to the server on internet monitoring.taack.com

3.2.7 GSM modem

If GSM modem is available, the GSM modem should be plugged on the controller (position F on figure 3)

3.2.8 Power supply

This operation must be performed by trained and authorised people only. Once the wiring of the installation is donne, 110VAC to 240VAC 50/60Hz power input shall be cabled on the controller as per detail A figure 3. The controller then starts the operation

4 OPERATION

After turning power supply ON (see §3.2.8):

- for about 10s screen is black,
- then for about 20s, the Obsta startup video plays,
- then the controller interface is displayed.

5 INTERFACES

5.1 Access right

The main screen is accessible without any password. 3 passwords grant 3 access level:

No password required		**View**
password1		**Maintenance** level
password2		Maintenance + **Configuration** level

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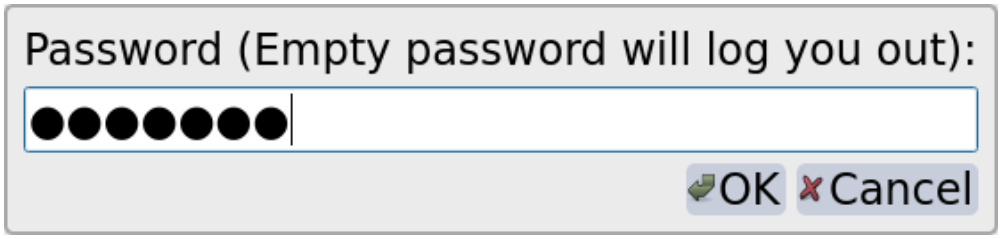
password3		Maintenance + Configuration + **Installation** level

When nothing is specified, item shall be considered of **View** level. Each time the screen goes in standby (15 min of inactivity), access level is reset to **View** only.

To login, from Home screen click on "Config" -> "Login" the following dialog is shown:



5.2 Main screen (on start up)

The main screen describes the overall system

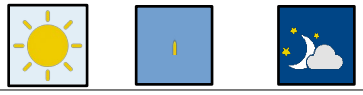
1

Those colored buttons represent the high intensity and/or medium intensity obstruction lights that have been assigned on each level of the obstacle (in this obstacle : 2 levels of respectively 1 light and 4 lights). Unassigned lights are not displayed, click on « Maintain » button to check if all lights are correctly assigned). The color represents the status of each light and is refreshed every 3 seconds:

	Light is in NORMAL status
	Light has reached 150 000 hours of operation or the light alarm relay is activated
	Light is in a critical mode
	Data link is lost (light is disconnected, powered-off, in communication failure...)

2

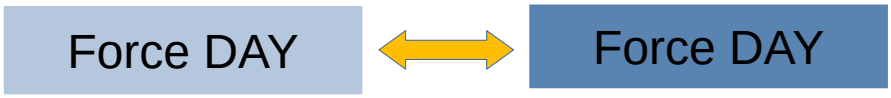
This indicator represents the day or twilight or night mode from the selected source (photocell or GPS)



3

Those 3 buttons allows you to bypass the selected day/twilight/night source (photocell or GPS) and force one of the 3 modes.

For all “Force” button, if at least one light “managed” by this button is forced, it shall blink like that:



Then, if all lights “managed” by this button are forced, the button shall also be selected

Clicking on it will unforce all the “managed” lights.

Note: the homepage buttons do not manage unassigned lights.

4

Button to access « Advanced » screen

5

Button to access « Maintain » screen.

If a mode (DAY, TWILIGHT or NIGHT) is forced or a reset is activated on at least one light, this button shall blink (like described for “Force button” here above). This behavior applies also for all other screens where "Maintain" button is present.

6

Button to access to « Configuration » screen

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<table>
<tr><td>7</td><td>Those colored indicators indicate the status of the communication with the GPS, the CAN bus (control cable going to the lights), DTN (photocell), Modbus (TCP Modbus), or MQTT (OBSTA server)
<table>
<tr><td></td><td>Not used, the interface is de-activated</td></tr>
<tr><td></td><td>The interface is in use and OK</td></tr>
<tr><td></td><td>The interface is not OK or not connected. For exemple, GPS antenna is not connected, photocell status did not change for more than 48 hours etc.)</td></tr>
<tr><td></td><td>For Modbus and MQTT, indicates another operator is passing commands from this interface.</td></tr>
</table></td></tr>
<tr><td>8</td><td>If internet or ethernet is activated, displays the IP address assigned to the controller (or display « WAIT DHCP/MODEM » if interface is configured dynamic but IP address not received).</td></tr>
<tr><td>9</td><td>Display the time and date of the controller</td></tr>
<tr><td>10</td><td>Display the flash per minute frequency set in the controller</td></tr>
<tr><td>11</td><td>Display the number of connected lights (and among which the number of unassigned lights)</td></tr>
<tr><td>12</td><td>Display the number of lights in failure mode</td></tr>
<tr><td>13</td><td>Display the number of not connected lights</td></tr>
<tr><td>14</td><td>Display the percentage of overall failure, computed as follows:
% = (nb of disconnected lights + nb of lights in failure) / assigned nb lights
Note: light is "in failure" if any light default (refer to §5.5.2) is present (except GPS_DTN_SYNCHRO and ERRORS_TRIGGERED_RELAY which are ignored).
In case no light is assigned, then percentage is:
% = nb of lights in failure / nb connected lights
The color of this indicator also indicate if the percentage is less or above the threshold defined in the controller:
<table>
<tr><td></td><td>% below the threshold defined in the controller (LIGHTS_DEFAULT not activated)</td></tr>
<tr><td></td><td>% above the threshold defined in the controller (LIGHTS_DEFAULT activated)</td></tr>
</table></td></tr>
</table>

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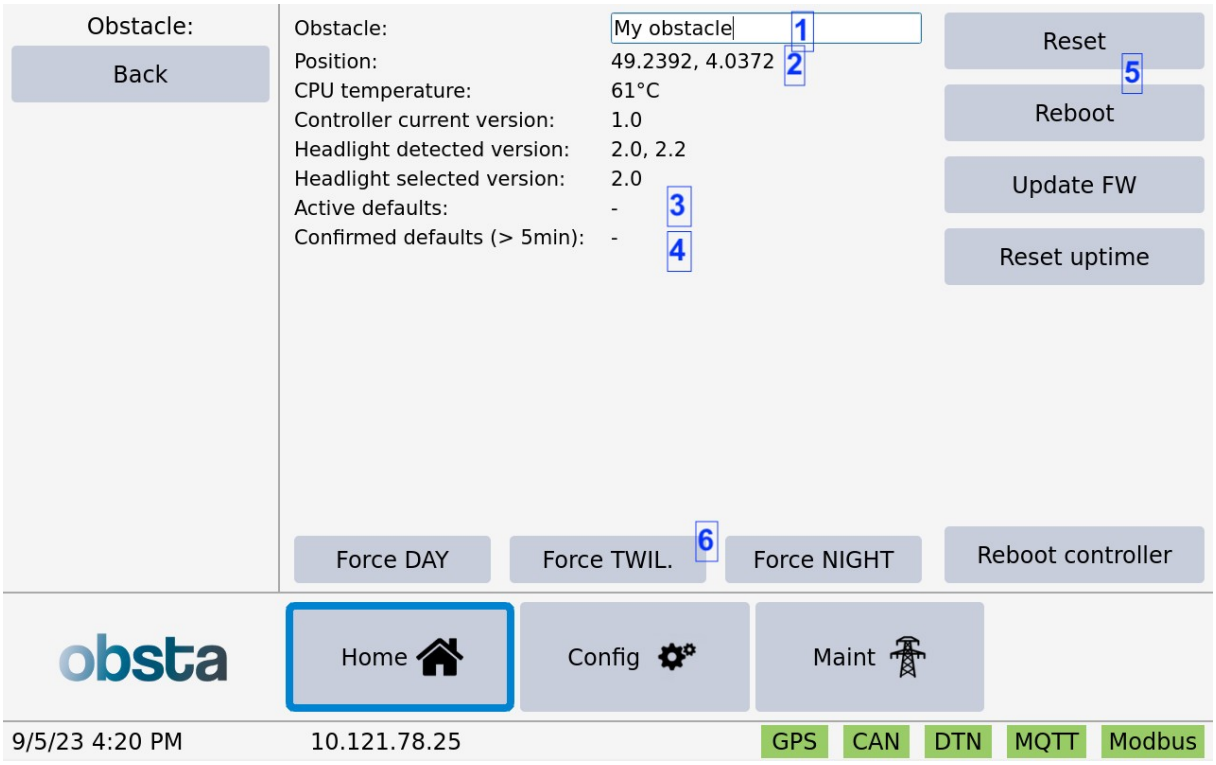
5.3 Advanced screen (Maintenance level)



1	Edit field for the name of the obstacle (displayed on the main screen).
2	Last received GPS position by the controller
3	Currently detected default (see §5.5). Alarm may still not be reported, see following field.
4	Confirmed defaults defaults (see §5.5) lasting for more than « n » minutes (see §5.4.7) and generating an Alarm.
5	Reset buttons blink with same rules then Force mode as explained for the main screen (§5.2). "Reset Uptime" and "Firmware update" buttons process their behaviour over the whole obstacle (all connected lights). A confirmation dialog will be displayed.
6	Force buttons for the mode blink with same rules as explained for the main screen (§5.2).

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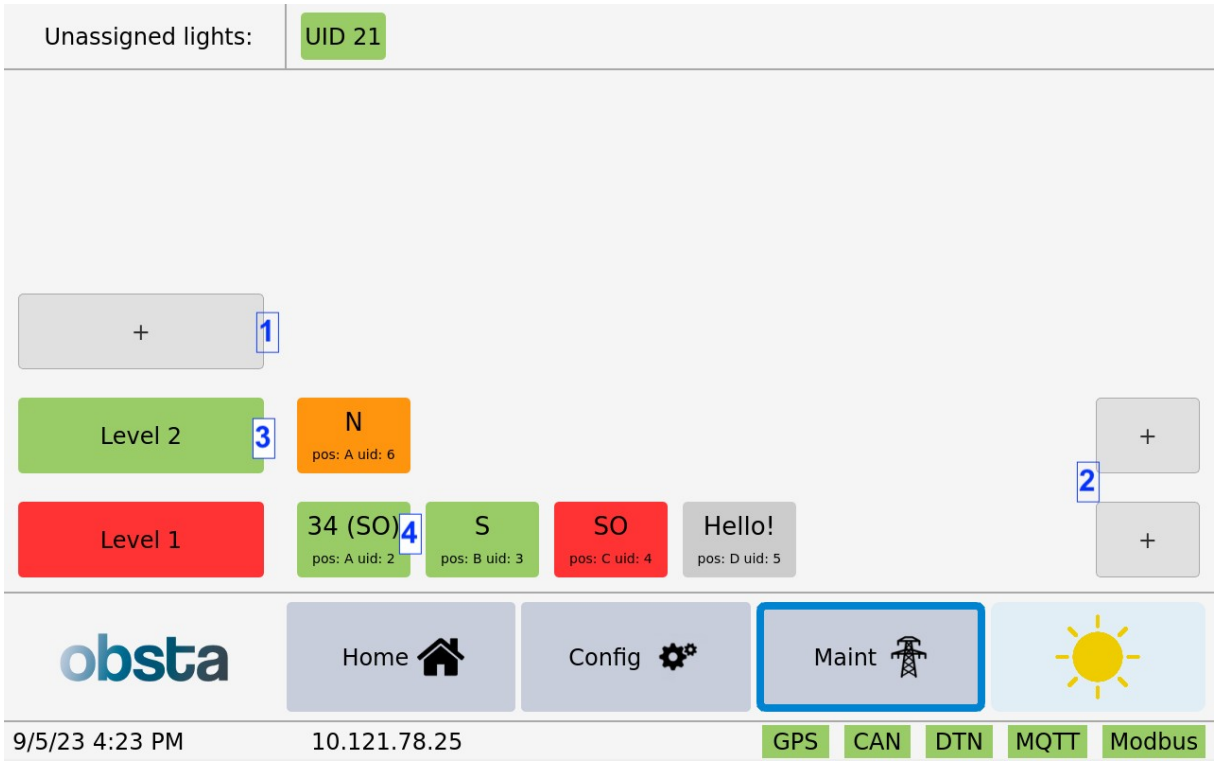
5.4 Maintenance screen (Maintenance level)

5.4.1 Assigning the lights

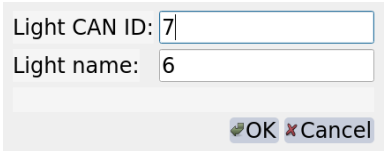
This screen describes the procedure to assign the lights to level and to name them.
Drag and drop is possible:

- to move light:
  - to a different place inside given level
  - from one level to another
  - from unassigned to assigned section and vice-versa
- to move level:
  - to a different place inside obstacle
  - to delete level (dragging it in unassigned section)



1	Create a new third level
2	Assign the remaining assigned light UID21 to an existing level 1 or 2 (or create a new light with another UID, if you plan to connect it later)
3	Button to access to the details of the level (see « Level data » below §5.4.2)
4	Button to access to the details of the assigned light (see « Light data »below §5.4.3)

Upon clicking on 2, the following dialog displays. It allows to define the label and ID number of the light:



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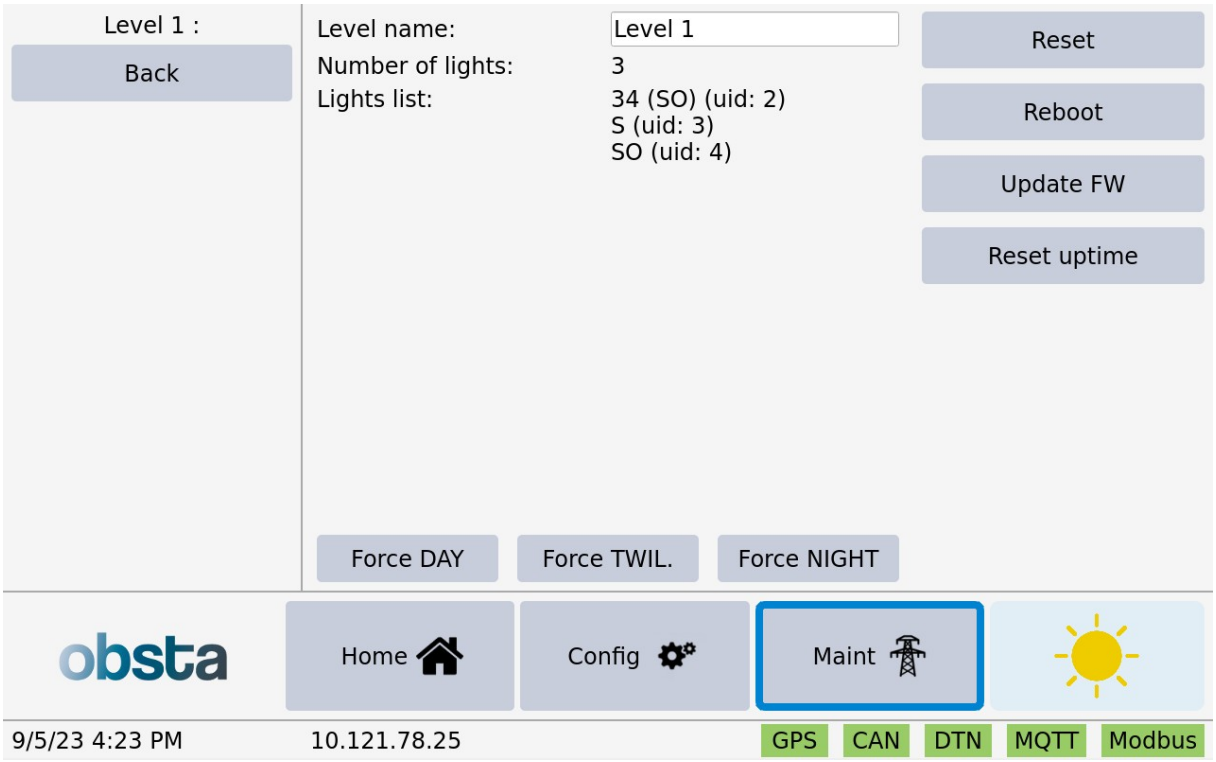
5.4.2 Level data

Name of the level can be defined in this screen.

All "Force *", "Reset", Reboot", "Update FW" and "Reset uptime" buttons act as desribed in §5.2 and 5.3, but affecting only lights from this level.



5.4.3 Light data

This screen gives the details of the selected light and the possibility to name it. Those information are refreshed every 3 seconds

All "Force *", "Reset", Reboot", "Update FW" and "Reset uptime" buttons act as desribed in §5.2 and 5.3, but affecting only lights from this level.

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1	Define the label of the light
2	Display the number of led circuits in error
3	Display the mode of the light, here the light is in DAY mode
4	Button with detailed display lights configuration (selected by dipswitch SW1). Click on this button to view the « light configuration data »
5	Display the firmware version installed in the light, the internal voltage, the temperature and humidity inside of its power unit, the time of operation since its first installation

5.4.4 Configuration data

This screen gives access to the details of the configuration of the selected lights with:

- number of flashes per minute during the day, twilight and night,
- flash duration and current value,
- numbers of power cards in used for this light,
- default action in case error happens depending on the mode (day/twilight/night)

If used, the sensitivity of the built-in photosensor of the light is also defined for night and twilight mode.

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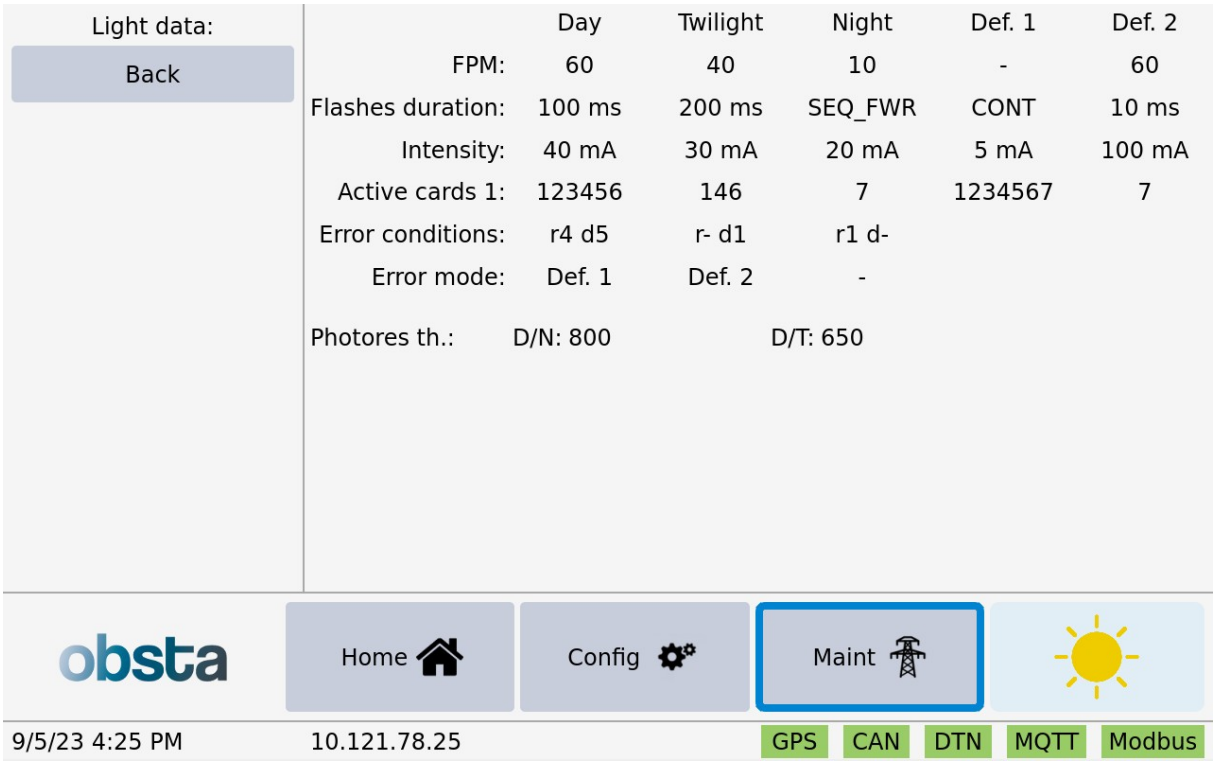

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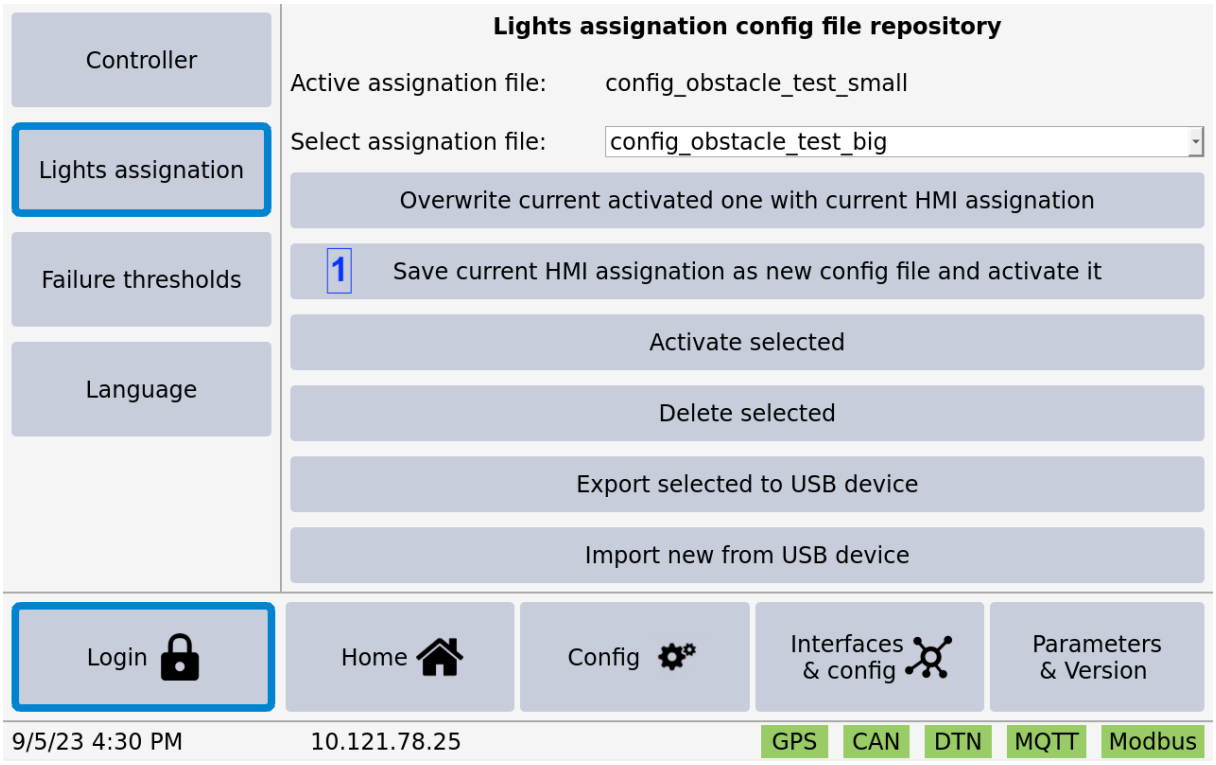
5.4.5 Saving Light assignation

Once the assignation of the light is defined in the controller, it must be saved.



1	For a new installation, click on « Save current HMI assignation as new config file and activate it », then provide a file name. The assignation of the lights is now memorized in the controller
	Other buttons offer possibility: • To save current assignation into currently active assignation file (overwrite it) • To activate/delete the selected assignation file from list above. • To export/import assignation files to an USB key (for any backup/restore need).

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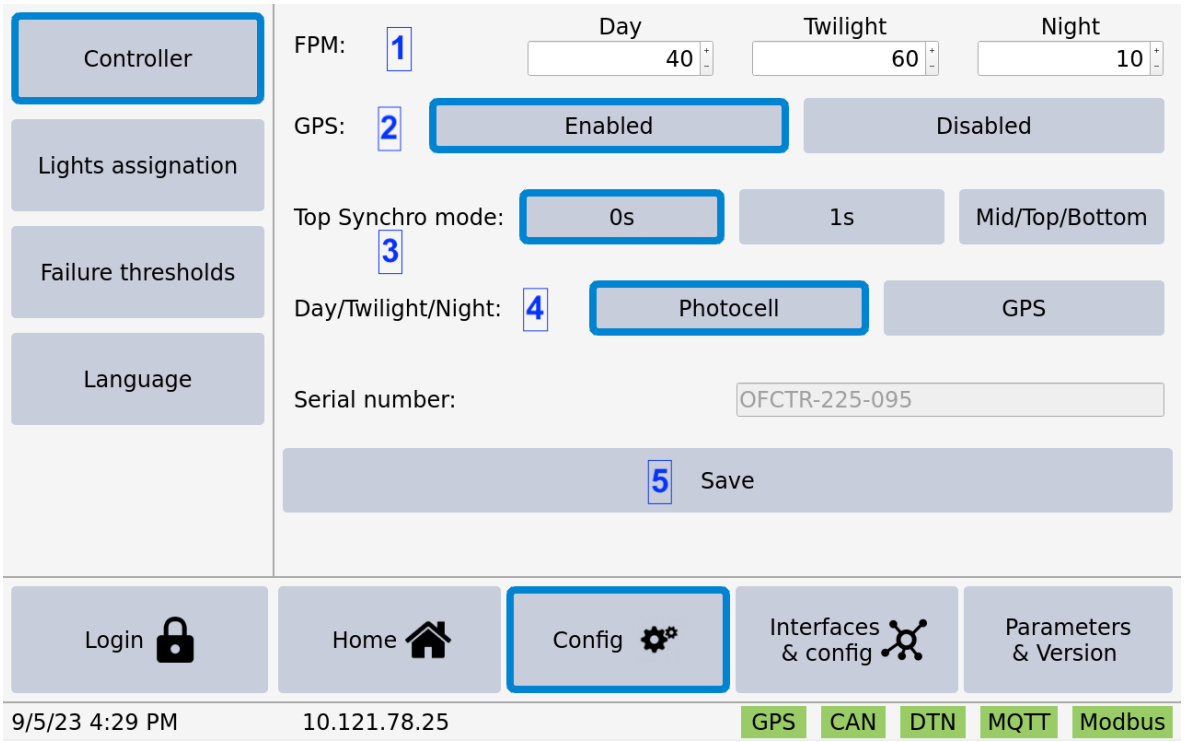
5.4.6 Configuration of the controller (Config button of the main menu)

This screen allows to define the flashes and day/twilight/night generated by the controller:



1	Define the flash per minute of all the lights connected to the controller. Warning : Changing this setting must be done in accordance with local regulation (or ICAO definition as per Annex 14 of Chapter 6 which requires 20 to 60 flashes per minute for medium intensity systems and 40 to 60 flashes per minute for high intensity systems). Those settings will also override the default setting in the configuration of each light.
2	Define if the GPS of the controller should be activated or not. If activated, the GPS will: • update the clock with local time/localization and will set the flash sequence as 3 • provide computed day/twilight/night mode to controller, if selected in 4
3	If GPS activated, sets up the start of the flashes at the « 0 » second of each minute of the UTC time, or the « 1 » second of each minute of the UTC time, or if the flashes should be in sequence (special requirement for transmission line, this option shall be also configured in the configuration light via dipswitches)
4	Defines if the photocell or the GPS should be used as source for the day/twilight/night mode change
5	Save those settings in the memory of the controller by clicking on « Save »

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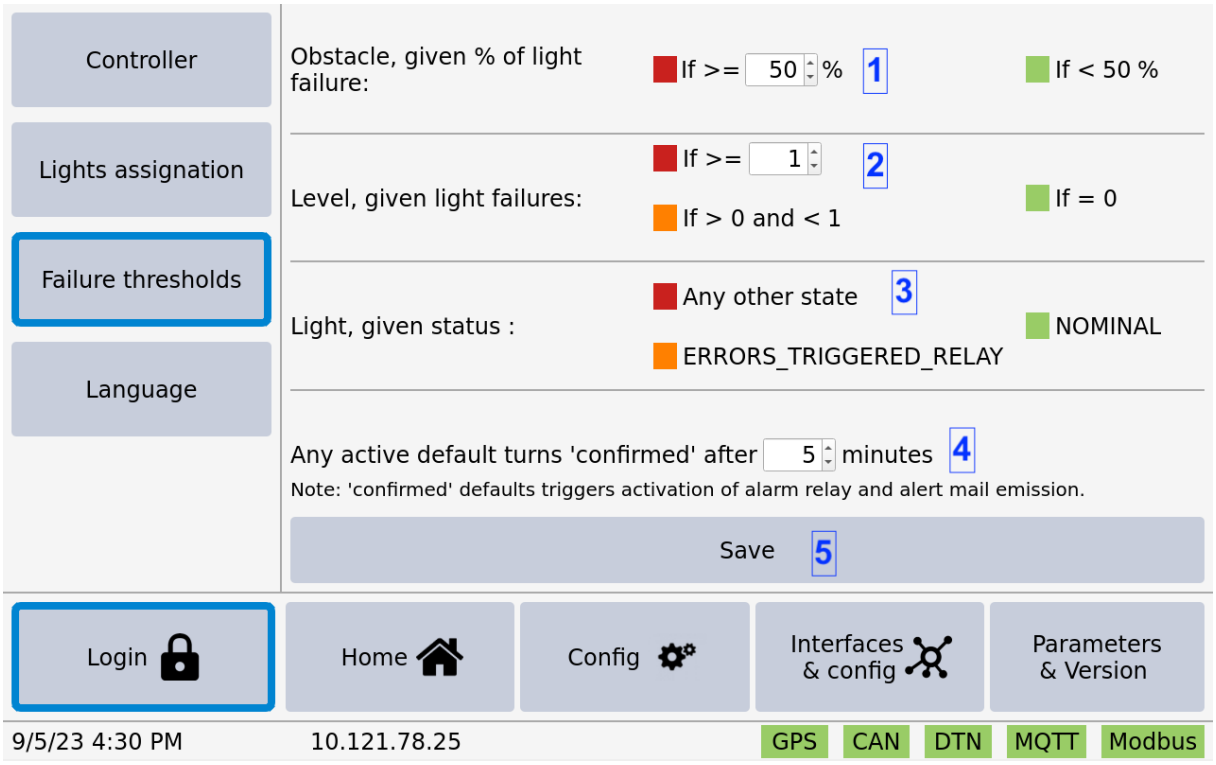
5.4.7 Setting of the alarm reported by the controller (“Failure thresholds” button)

This screen allows to define the condition before the controller sends an alarm remotely.



1	The light failure percentage to trigger LIGHTS_DEFAULT default on Controller (see §5.2 and §5.5.1)
2	A threshold on number of light in failure for selecting level color display in Maintenance screen (only for graphic display purpose)
3	Light color display legend for Main (Home) and Maintenance screen
4	Defines the duration before the alarm is confirmed and reported
5	Save those setting in the memory of the controller by clicking on « Save »

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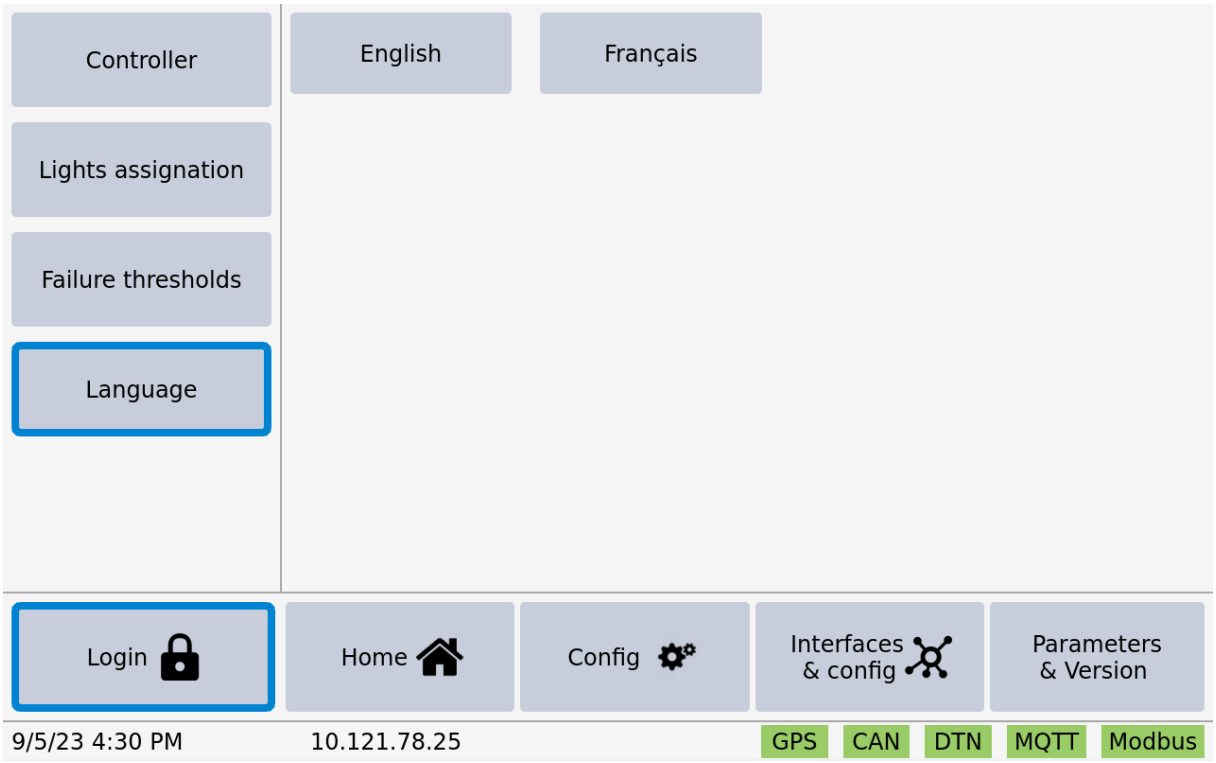
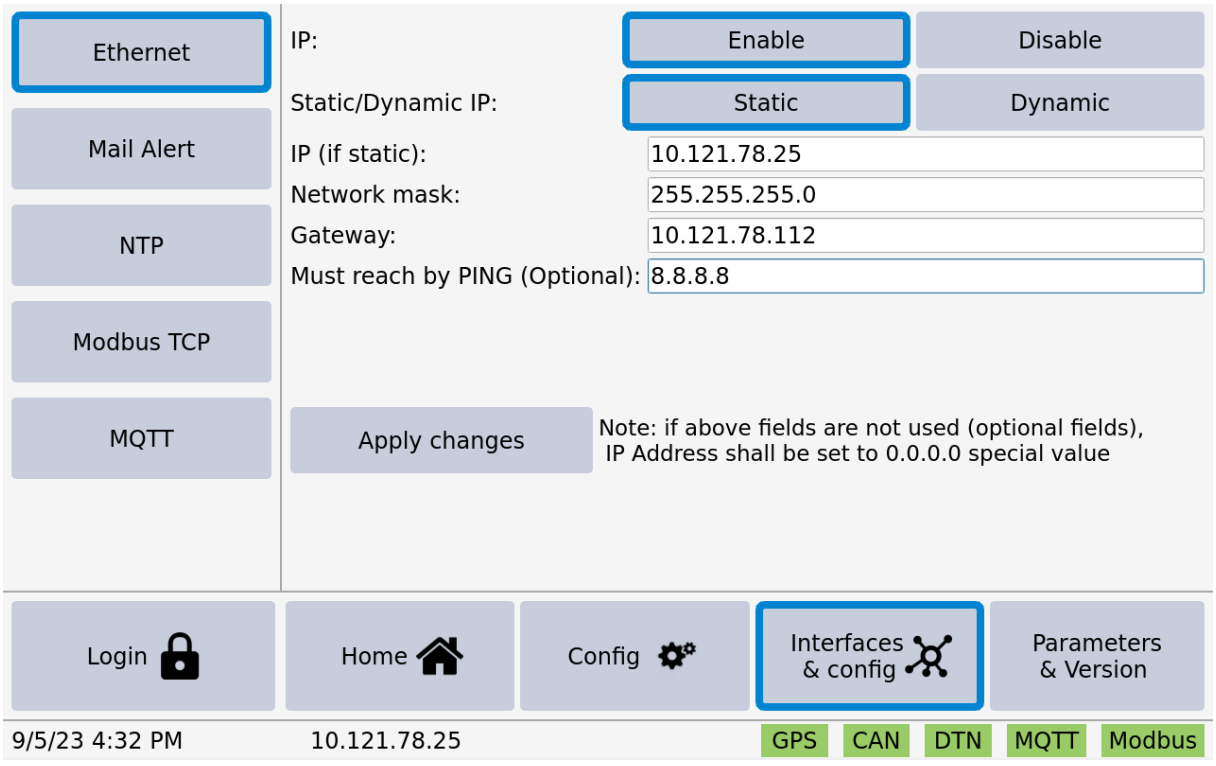
5.4.8 Setting of the language of the screens (“Language” button)



5.4.9 Setting of the Ethernet parameters (“Ethernet” button in “Interface & config” menu)

This screen allows to define the network interface parameters so that the controller could communicate through a RJ45 or GSM modem. This screen must be set up if the controller has to communicate.



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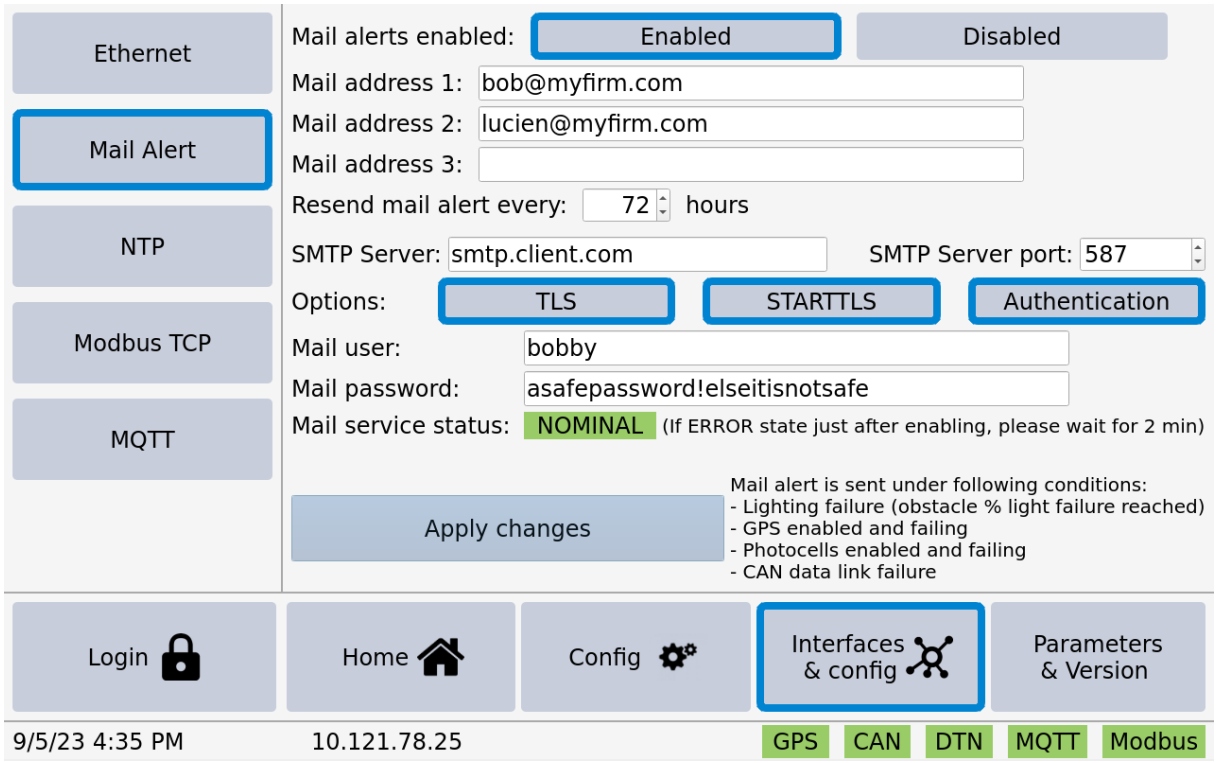
5.4.10 Setting of the Mail alert (“Mail Alert” button in “Interface & config” menu)

If an internet conection is available, or if SMTP mail server is available on local ethernet network, this screen gives the possibility to the controller to send email notification in case of failure of the lights, the GPS, the photocell, etc. (see §5.5.1). See annex 1 for a format of email)



5.4.11 Setting of the NTP (“NTP” button in “Interface & config” menu)

In an internet connection is available, this screen gives the possibility to define the address of a NTP server for time synchronization (useful only if no GPS is used).

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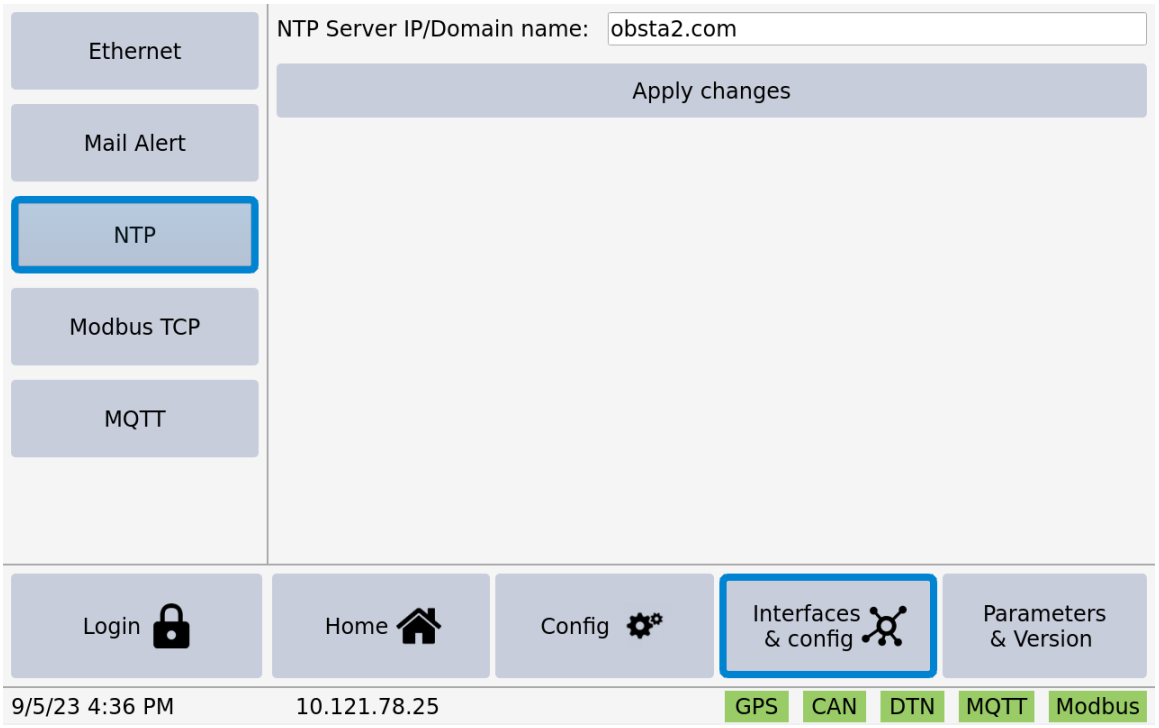
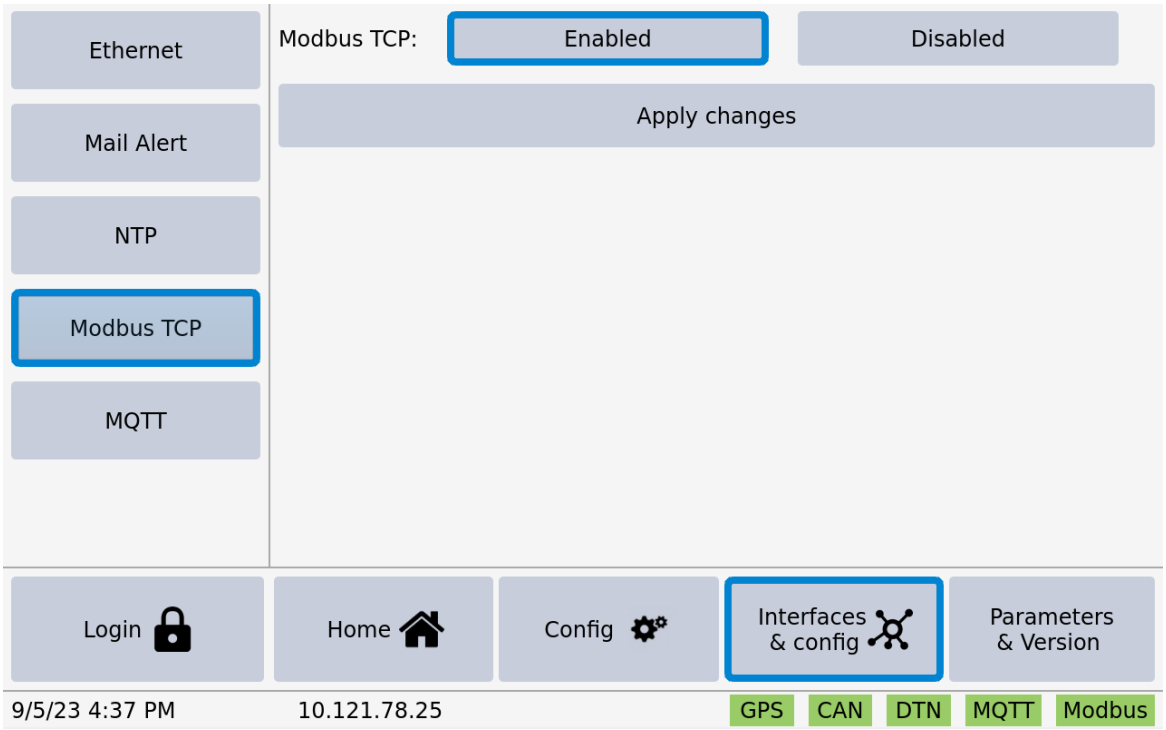


5.4.12 Setting of the Modbus TCP protocol ("Modbus TCP" button in "Interface & config" menu)

If a local ethernet connection is available, this screen gives the possibility to activate Modbus TCP (slave). This allows a server to read the information of the controller. See annex 2 for the format of the information sent by the controller.



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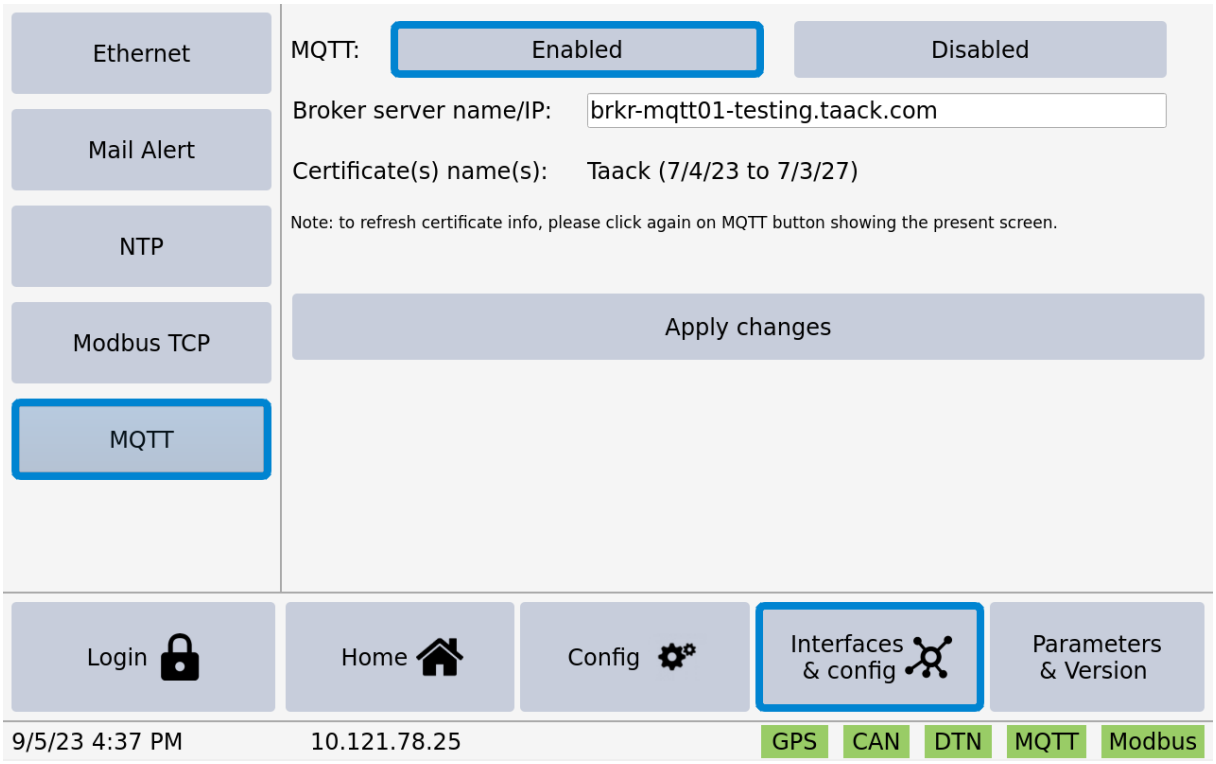
5.4.13 Setting of the OBSTA server (“MQTT” button in “Interface & config” menu)

If an internet connection is available, this screen allows to activate the communication of the controller with OBSTA server (internet address https://monitoring.taack.com/). The controller will then send to OBSTA server every 30 minutes all the information of the controller. This allows to get a precise remote diagnostice of the complete system.



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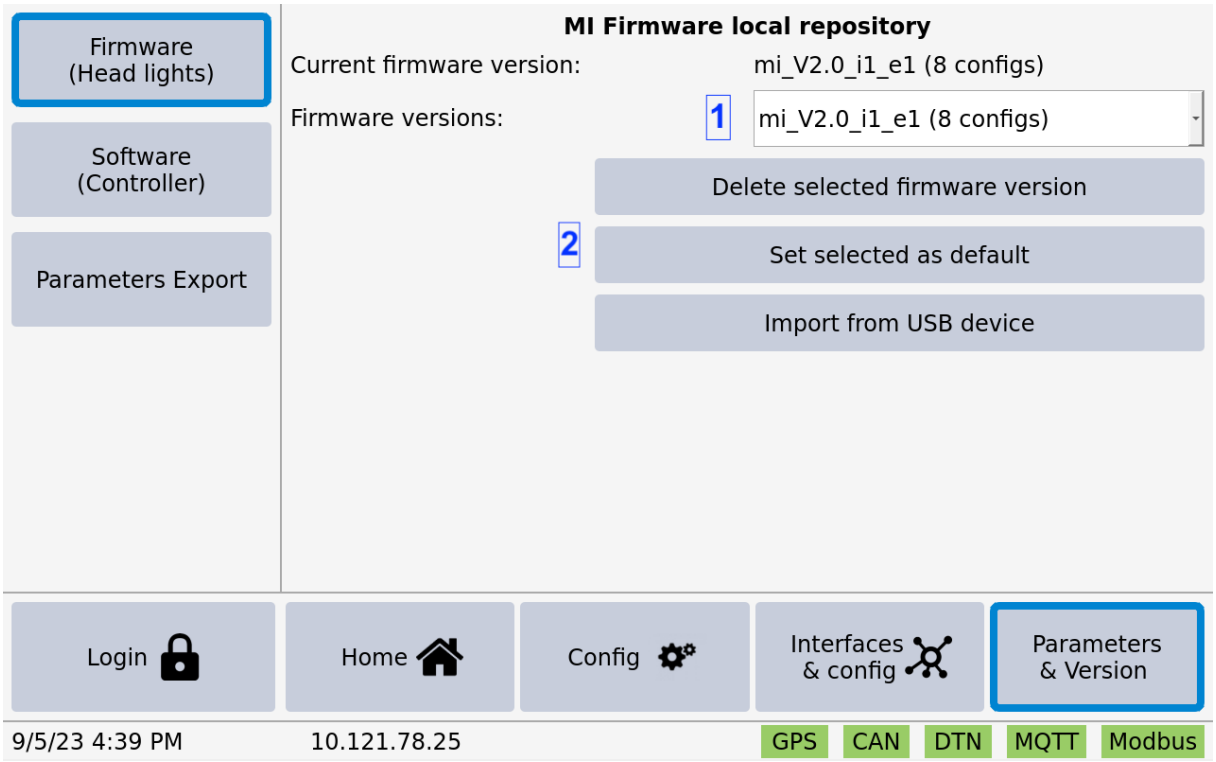
5.4.14 Select the lights firmware version to update (“Firmware (Head lights)” button in “Parameters & Versions” menu)

This action should be performed with the authorization of OBSTA. This screen allows to select the firmware version before triggering light update (button "Update FW" in §).



1	List of available head lights firmware versions on Controller. Selected one is the one currently displayed
2	Select the version from to be used when clicking on any "Update FW" button
	Other buttons allow to: • Delete any existing version on Controller • Import a new firmware version from USB key

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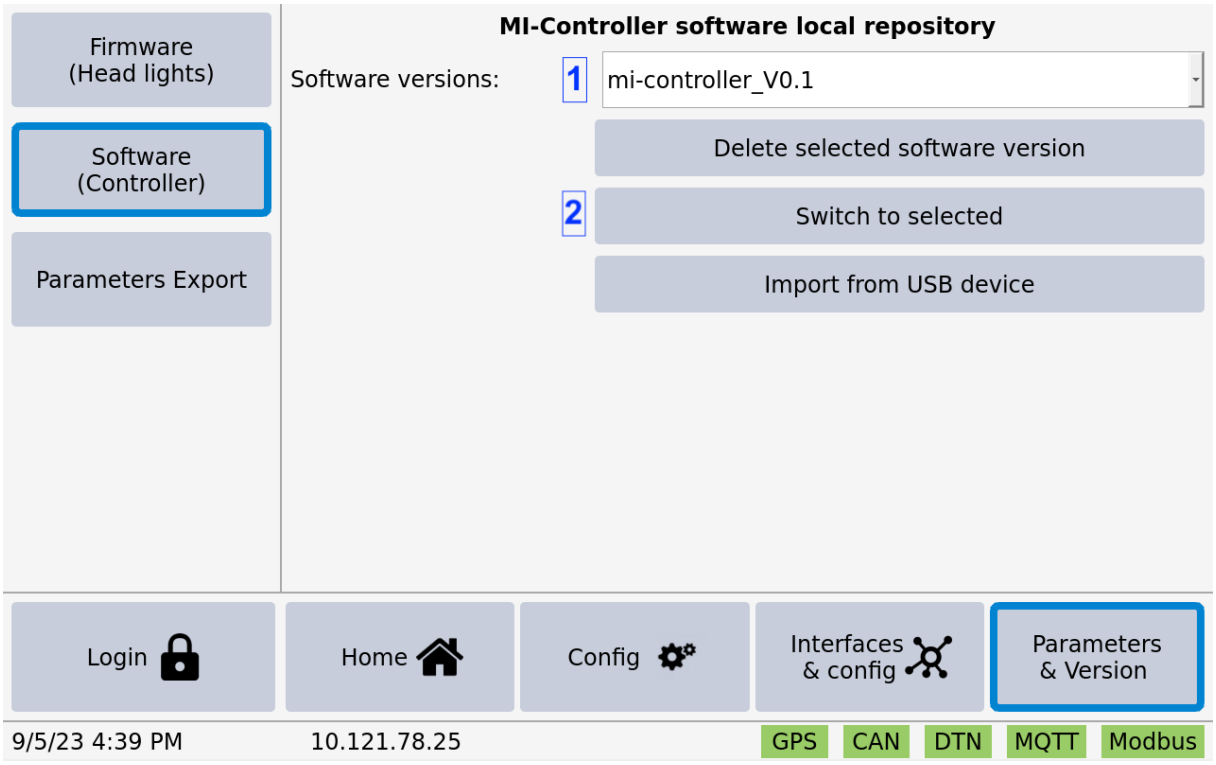
5.4.15 Update the software of the controller (“Software (Controller)” button in “Parameters & Versions” menu)

This action should be performed with the authorization of OBSTA. This screen allows to update the software of the controller.



1	List of available Controller software versions. Selected one is the one currently displayed
2	Update current Controller version to selected one above (confirmation dialog will display)

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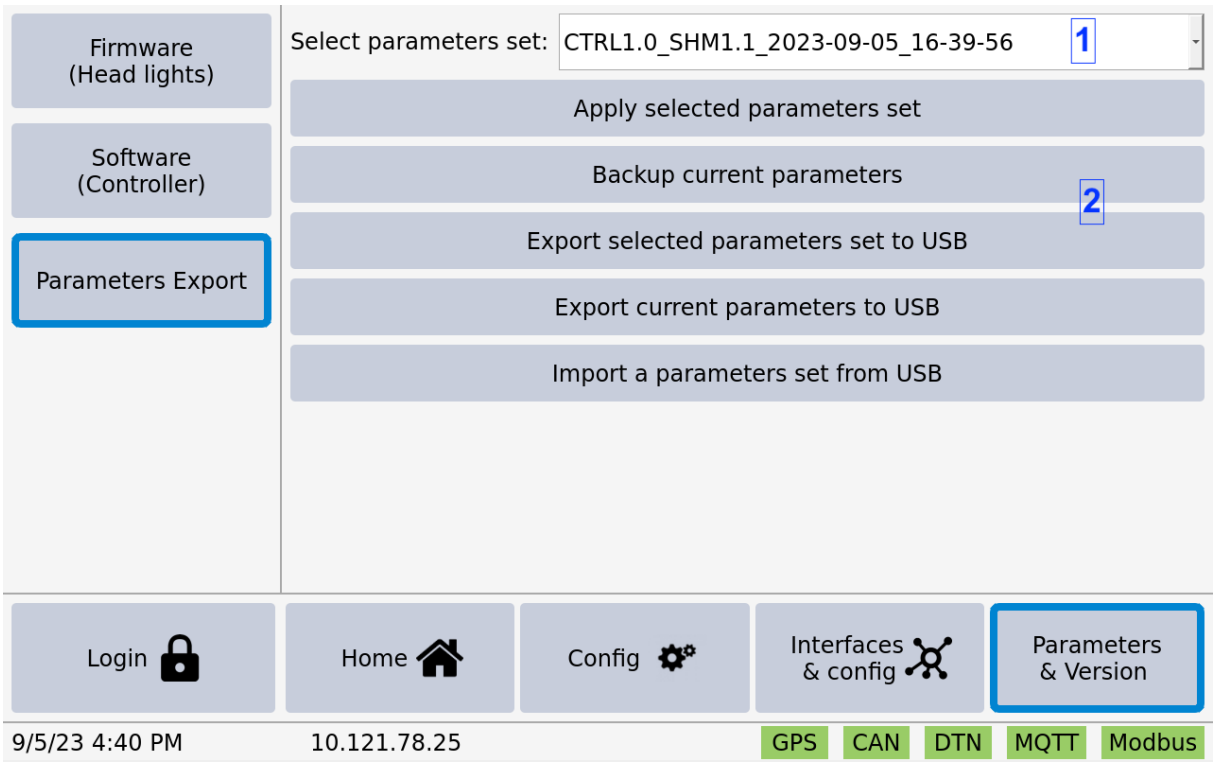
5.4.16 Export the parameters of the controller("Parameters Export" button in "Parameters & Versions" menu)

This action should be performed with the authorization of OBSTA. This screen allows to export all configuration data of the controller, to backup/restore all Controller configuration in a one-shot opertation.



1	List of previously backupped parameters set
2	Buttons allows to: • Backup current parameters of the Controller, • Apply an existing backup, which means restoring all parameters from this backup, • Import/Export paramaters set files from/to USB key.

5.5 Alarm & defaults

5.5.1 Controller

The following default may be triggered on Controller and set an Alarm, in priority order:

CAN_DISCONNECTED	No light are detected via data link, or major interface error

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LIGHTS_DEFAULT	Light default threshold has been reached (see §5.2)
GPS_OUT_OF_SYNC	Controller GPS is enabled but out of synchronization
DTN_UNCHANGED	Controller day/twiliht/night mode current source (Photocell or GPS) has not changed since last 48 hours
EXTERNAL_COM	Controller has some external interfaces enabled but not in nominal state (Ethernet/modem in failure and/or Modbus or MQTT in failure)
MAINTENANCE	When up time counter of one or more lights have reached maintenance threshold (131400 hours = about 15 years)

5.5.2 Lights

The following default may be triggered on Lights, in priority order:

POWER	Power supply voltage excessive or insufficient
CONFIG	Light dipswitch configuration inconsistency
ERRORS_TRIGGERED_DEF_MODE	Reached threshold of nb of channel errors for Default mode activation
ERRORS_TRIGGERED_RELAY	Reached threshold of nb of channel errors for relay activation
SLAVE_SYNCHRO	Light is slave and no SYNC_IN signal received from master (not Top synchro message received on datalink)
GPS_SYNCHRO	GPS of Light is activated and internal light timing is (still) not synchronized with GPS clock
DAYNIGHT_UNCHANGED	Day/Twilight/Night unchanged since 48h, or transition too late / GPS info
EXTERNAL_COMM_PROBLEM	Ethernet or CAN data link communication problem
GPS_DTN_SYNCHRO	GPS is used as DTN (day/twilight/night) source and DTN is (still) not available

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6 START-UP AFTER INSTALLATION

7 TROUBLESHOOTING

Problem encountered	Possible solution
Controller does not start	Check power supply is turned ON.
Controller relay alarm is set Mail notification is received Web server reports alarm (obstacle in red)	Check the current report default, considering the highest priority default first (see §5.5.1). If it is: • **CAN_DISCONNECTED**: 1. Check proper wiring of 3 wires CAN data link, and presence of terminal resistor, 2. Check Head-lights are power-supplied, 3. Check Head-lights do not display a POWER (fast blink) or CONFIG default (long-short-short-short) on Default led. • **LIGHTS_DEFAULT** 1. Check all lights of obstacle are properly assigned (see §5.4.1) and connected, 2. Check defaults on lights displayed in orange or red in interface. • **GPS_OUT_OF_SYNC** 1. Wait up to 15 minutes, GPS may take time to synchronize regarding atmosphere and localization factors (weather conditions...) 2. Check antenna is properly connected, and located in a place it can catch GPS signal. • **DTN_UNCHANGED** 1. If Photocell is set as day/twilight/night source (see §5.4.6): ▪ Check correct wiring of Photocell ▪ Hide manually Photocell/light manually Photocell to cause day/twilight/night mode change. If displayed day/twilight/night on Main screen does not change, Photocell may be in failure. Else, exceptional weather conditions (near from poles) can cause to stay in a given mode, causing this default: contact Obsta. 2. If GPS is set as day/twilight/night source (see §5.4.6), check you are not near enough from poles, when a mode can stay for more than 48 hours. In this special case, contact Obsta. • **EXTERNAL_COM** 1. If using local network with RJ45 wire, check proper connection of RJ45 to the network (using another terminal to 'ping', for example). If still not resolved and if **MQTT** used and display in red in status bar: 1. Check that you can ping the MQTT broker address with another terminal, 2. Check that your firewall does not block port 8883. 3. Check current certificate is still valid (dates displayed at

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	§5.4.13). Else, contact Obsta. 4. Ask Obsta for verifying proper configuration of MQTT broker address. 2. If using modem to connect to internet: 1. Check modem antenna is properly connected, and located in a place it can catch 2/3/4G signal. 2. Check current certificate is still valid (dates displayed at §5.4.13). Else, contact Obsta. 3. Ask Obsta for verifying proper configuration of MQTT broker address. • **MAINTENANCE** You may proceed to your maintenance procedure, then reset the up time counter to remove the default.

8 MAINTENANCE

8.1 Annual visit

Test	Frequency	Action	Sanction	Solution
Cable	Annual	- Tighten Power card connector's screw - Tighten Projector's connector plugged on the PSU		
Screen	Annual	- clean the screen		
Corrosion	Annual	Visual	No excessive corrosion	Replace defective part

8.2 GSM modem

A 3G 4G or other type type of GSM modem with SIM card can be proposed for the ethernet connection. Consult your OBSTA representative

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9 ANNEX 1 – EMAIL

From : <mail-status@citelbe.com>
Date: Fri. 21 apri. 2023 à 14:20
Subject: [OBSTA] Lightning system for No name building - default detected
To: <etienne.de-sarrieu@citel.fr>

Hi,

This is an automatic email to warn supervisor for obstruction lightning system about failure detection.

Obstacle:
name: No name building
position: 49.2391, 4.0374
local time: Friday, April 21, 2023 2:20:18 PM CEST

Reported failure reason is:
LIGHTS_DEFAULT: Light default threshold has been reached (def. lights = 25%, threshold = 10%)
GPS_OUT_OF_SYNC: Controller GPS is out of synchronization

This email will be sent every 1 hours until problem resolution (or mail alert deactivation).

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10 ANNEX 2 – TCP MODBUS

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1 Document purpose

This note describes available attributes/data via Modbus TCP (via ethernet link) on Obsta MI/HI Headlights Controller.

2 Applicable and reference documents

Applicable documents are :

	Name	Reference	Date	Version
[DA1]	TAACK_LOGICIELS_PMP_V1R1	taack-2018-016	12/03/2020	V1R1

3 Modbus TCP slave interface

Please note that this interface is available only via Ethernet RJ45 plug of Controller.

3.1 Ethernet configuration

IPv4 address, netmask and gateway can configured/modified via Controller HMI, or if not HMI is used, Obsta can configure this parameters.

Note: standard TCP port 502 is used for Modbus Slave interface (this cannot be changed).

3.2 Holding/Input registers

For now, monitoring only is possible via Modbus TCP. So only a read access is possible for Modbus registers.

Controller supports function 3 (Read Holding Registers) and 4 (Read Input Registers) of Modbus TCP.

Data endianess is big-endian, as default for Modbus protocol.

3.2.1 Limitations

Up to 64 consecutive words may be read at a time.

3.2.2 Registers offset and description

Following data is available for monitoring:

3.2.2.1 Controller information

Offset	Modbus size (words)	Data size (bytes)	Data type	Attribute name	Content
0x0000	32	64	64*char	Serial Number	String up to 63 char, NULL terminated, equal to controller unique serial number
0x0020	1	2	2*uint8	Modbus interface version	MSB uint8 is major version, LSB uint8 is minor version. Interface version changes each time the present attributes description document changes
0x0021	64	128	128*char	Building name	String up to 127 char, NULL terminated, containing the obstacle name
0x0061	4	8	uint64	Lights mask	Each bit of this maks is set to 1 if light of the corresponding CAN ID is connected
0x0065	1	1	uint8	Confirmed defaults mask	Mask of controller confirmed defaults, see **ctrl_default_t** in §3.2.2.2
0x0066	1	1	uint8	GPS status	GPS (for time and position) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x0067	1	1	uint8	Flash service status	Flash service (triggering lights flashes) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x0068	1	1	uint8	Monitoring service status	Monitoring service (for lights ctrl/cmd) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x0069	1	1	uint8	DTN service status	DTN service (for Day/Twilight/Night state + network & GPS management) state. DISABLED = 0, NOMINAL = 1, ERROR = 2
0x006A	1	1	uint8	Network status	Network (Ethernet RJ45 or USB modem) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x006B	1	1	uint8	MQTT service status	MQTT service (for web monitoring) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x006D	1	1	uint8	Mail service status	Mail service (for notifications) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x006E	1	1	uint8	Log service status	Log service (for internal event recording) state, DISABLED = 0, NOMINAL = 1, ERROR = 2
0x006F	1	1	uint8	Services in use mask	Mask of interfaces currently accessing controller, see **ctrl_default_t** in §3.2.2.2 Used to detect that another user may concurrently be changing parameters.
0x0070	1	1	int8	CPU temperature	Degree Celsius (from -40 to 105°C)
0x0071	1	1	uint8	Day/Twilight/Night mode	UNKNOWN = 0, DAY = 1, TWILIGHT = 2, NIGHT = 3
0x0073	4	8	uint64	Forced Day lights mask	Mask of lights currently forced to Day mode (Each bit of this maks is set to 1 if light of the corresponding CAN ID is forced to Day)
0x0077	4	8	uint64	Forced Twilight lights mask	Mask of lights currently forced to Twilight mode
0x007B	4	8	uint64	Forced Night lights mask	Mask of lights currently forced to Night mode

0x007F	1	1	uint8	Day FPM	Number of flashes per minute while in Day mode
0x0080	1	1	uint8	Twilight FPM	Number of flashes per minute while in Twilight mode
0x0081	1	1	uint8	Night FPM	Number of flashes per minute while in Night mode
0x0082	1	1	uint8	Top synchro mode	0 (TOP_SYNC_SEC0) to send top synchro aligned on second 0 of each minute 1 (TOP_SYNC_SEC1) to send top synchro aligned on second 1 of each minute 2 (TOP_SYNC_MID_TOP_BOT) to send specific middle/top/bottom top synchro messages aligned on second 0
0x0083	1	1	bool	GPS for synchro	Use GPS for controller internal time clock
0x0084	1	1	bool	GPS for DTN	Use GPS for Day/Twilight/Night mode, from localization + time, compute sun position and determine mean Day/Twilight/Night transition events. If set to false, Photocell is used.
0x0085	2	4	float	Latitude	Current GPS latitude value (NaN special value if not set)
0x0087	2	4	float	Longitude	Current GPS longitude value (NaN special value if not set)
0x0089	64	128	128*char	NTP server	String up to 127 char, NULL terminated, containing the NTP server hostname for internal time clock, if GPS is not used or in case of GPS failure
0x00C9	64	128	128*char	MQTT broker	String up to 127 char, NULL terminated, containing the MQTT broker hostname
0x0149	1	2	2*char	Language	String of two char, containing the current language in ISO639-1 format.
0x0200	1	1	uint8	Delay for confirmed default	Minutes delay after which an occurring default appears in Confirmed default mask (and alarm relay is triggered)
0x0201	1	1	uint8	Max percentage of default lights	Above this threshold of disconnected/defective headlights, a CDEF_LIGHTS_DEFAULT is raised.
0x0202	1	2	uint16	Mail resend period	In case of "Confirmed defaults mask" not empty, resend mail every "Mail resend period" hours
0x0203	2	4	uint32	Up time threshold	Headlights with "Up time" above this value will raise a CDEF_MAINTENANCE.

3.2.2.2 Details on controller enumerations

ctrl_default_t:

```
   CDEF_NONE             = 0,
   CDEF_CAN_DISCONNECTED = 1 << 0,   ///< Can is not connected: no light are detected or interface error
   CDEF_LIGHTS_DEFAULT   = 1 << 1,   ///< Light default threshold has been reached
   CDEF_GPS_OUT_OF_SYNC  = 1 << 2,   ///< Controller GPS is out of synchronization
   CDEF_DTN_UNCHANGED    = 1 << 3,   ///< Controller DTN has not changed since last 48 hours
   CDEF_EXTERNAL_COM     = 1 << 4,   ///< Controller has external interfaces enabled not in nominal state
   CDEF_MAINTENANCE      = 1 << 5,   ///< Up time counter of one or more lights have reached maintenance threshold
```

interface_t:

```
   ITF_NONE             = 0,
   ITF_HMI              = 1 << 0,   ///< Visual HMI from controller touchscreen
   ITF_MODBUS_TCP       = 1 << 1,   ///< Modbus TCP Ethernet interface
   ITF_MQTT             = 1 << 2,   ///< MQTT internet interface
   ITF_SNMP             = 1 << 3,   ///< SNMP ethernet interface
```

3.2.2.3 Headlights information

Headlight information is starting at offset 0x4000. Each light (given its CAN_ID from 2 to 63) data is located at offset: **0x4000 + CAN_ID * 0x0080**

Example : light 4 starts at offset 0x4200.

CAN_ID of existing lights are exposed in Controller information in attribute "Lights mask" (see §3.2.2.1)

Offset within light	Modbus size (words)	Data size (bytes)	Data type	Attribute name	Content
0x00	2	4	uint32	Last CAN update timestamp	Seconds timestamp since 01/01/1970
0x02	1	1	uint8	Light type	Constant value for MI-PCB based devices : LIGHT_MI = 1
0x03	17	33	33*char	Serial number	String up to 32 char, NULL terminated, equal to beacon unique serial number.
0x14	1	2	uint16	Headlight general status	Mask of **defaults_t** (see below). Mask to 0x0000 means headlight is in NOMINAL state.
0x17	1	1	uint8	Configuration number	Obsta preset index for Headlight parameters set, from 0 to 255.
0x18	1	1	uint8	Day/Twilight/Night mode	UNKNOWN = 0, DAY = 1, TWILIGHT = 2, NIGHT = 3
0x1B	1	1	uint8	Nb flashes per minute	40 means 40 FPM. 0 in continuous mode or if light is OFF.
0x1C	1	2	2*uint8	Firmware version	Most significant byte is major version, less significant byte is minor version
0x1D	1	2	uint16	Power supply voltage	Measured voltage * 100 (example: 4786 means 47,86V)
0x1E	1	1	uint8	Hygrometry	As percentage (from 0 to 100%)
0x1F	1	1	int8	Temperature	Degree Celsius (from -60 to 120°C)
0x20	2	4	uint32	Up time	Number of hours for which headlight was connected to controller
0x30	8	16	16*uint8	Power cards detailed status	First power card is index 0 of byte array, up to 16 power cards may be used (in HI-FAA case), but systems will only have up to 8 power cards. For each power card, status is **lamp_error_status_t**
0x42	1	1	uint8	Config update status	Status of headlight config update, see **canbus_config_update_status_t**
0x43	1	2	uint16	Firmware update status	Status of headlight firmware update, see **canbus_software_update_status_t**

3.2.2.4 Details on headlights enumerations

defaults_t:

```
DEF_NONE                        = 0,      ///< No default detected
DEF_GPS_DTN_SYNCHRO             = 1 << 0, ///< GPS DTN source is used and DTN is (still) not available.
DEF_EXTERNAL_COMM_PROBLEM       = 1 << 1, ///< Ethernet or CAN communication problem
DEF_DAYNIGHT_UNCHANGED          = 1 << 2, ///< Day/Twilight/Night unchanged since 48h, or transition too late / GPS info.
DEF_HIFAA                       = 1 << 3, ///< HIFAA is enabled and there is a problem of communication between Auxiliary and Main.
DEF_GPS_SYNCHRO                 = 1 << 4, ///< GPS is activated and internal timing is (still) not synchronized with GPS clock
DEF_SLAVE_SYNCHRO               = 1 << 5, ///< Light is slave and no SYNC_IN signal received from master.
DEF_ERRORS_TRIGGERED_RELAY      = 1 << 6, ///< Reached threshold of nb of channel errors for relay activation
DEF_ERRORS_TRIGGERED_DEF_MODE   = 1 << 7, ///< Reached threshold of nb of channel errors for Default mode activation
DEF_CONFIG                      = 1 << 8, ///< Dipswitch configuration inconsistency
DEF_POWER                       = 1 << 9  ///< Power supply voltage excessive or insufficient
```

lamp_error_status_t:

```
NOMINAL_LAMP                     = 0,      ///< Card is fully operational
ONE_REGUL_UNRELIABLE_ERROR       = 1 << 0, ///< One channel at least but not all have a regulation default. This default is persisted.
ONE_OPEN_CIRCUIT_ERROR           = 1 << 1, ///< One channel at least but not all is disconnected/in open circuit
ONE_PERSISTED_OPEN_CIRCUIT_ERROR = 1 << 2, ///< One channel at least but not all is persisted disconnected/in open circuit (when steady lighting)
ALL_REGUL_UNRELIABLE_ERROR       = 1 << 3, ///< Card has a regulation default on all channels. This default is persisted.
ALL_OPEN_CIRCUIT_ERROR           = 1 << 4, ///< Card has a disconnection/open circuit on all channels
ALL_PERSISTED_OPEN_CIRCUIT_ERROR = 1 << 5, ///< Card has a persisted disconnection/open circuit on all channels (when steady lighting)
SHORT_CIRCUIT_ERROR              = 1 << 6, ///< Card has a persisted short circuit on one or more channels (when steady lighting)
PERSISTED_SHORT_CIRCUIT_ERROR    = 1 << 7  ///< Card has a short circuit on one or more channels.
```

canbus_config_update_status_t:

```
CU_IDLE                             = 0,
CU_OK                               = 1 << 0,
CU_ONE_CONFIG_OK                    = 1 << 1,
CU_MISSING_PARTS                    = 1 << 2,
CU_BAD_CRC                          = 1 << 3,
CU_HIFAA_INVALID_CONFIG_SET         = 1 << 4,
CU_UNREACHABLE                      = 1 << 5
```

canbus_software_update_status_t:

```
SU_IDLE                             = 0,
SU_OK                               = 1 << 0,
SU_UNABLE_TO_INITIALIZE_OR_ERASE_FLASH = 1 << 1,
SU_TOO_LONG_DELAY_BETWEEN_MSG       = 1 << 2,
SU_DECRYPT_ERROR                    = 1 << 3,
SU_FLASH_WRITE_DISABLED             = 1 << 4,
SU_FLASH_WRITE_OPERATION_FAILURE    = 1 << 5,
SU_BAD_CRC                          = 1 << 6,
SU_FLOW_CONTROL_ERROR               = 1 << 7,
SU_OTHER_UPDATE_ALREADY_IN_PROGRESS = 1 << 8,
SU_CAN_UPDATE_ALREADY_IN_PROGRESS   = 1 << 9,
SU_UNREACHABLE                      = 1 << 10
```