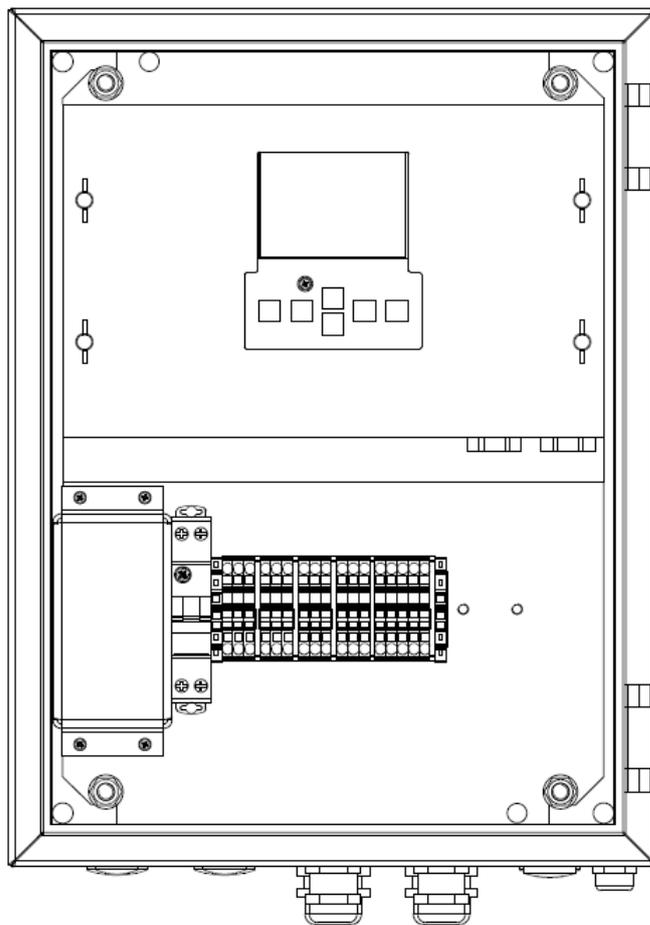


## Obelux Control Panel



User's Manual  
Version 1.2

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# 1 CHANGE LOG

<b>Version</b>	<b>Date:</b>	<b>Description:</b>	<b>Author</b>
0.1	01.08.2016	Document created	AHa
0.9	26.09.2016	Draft version for internal review	AHa
1.0	07.10.2016	Document release	AHa
1.1	03.5.2018	UI updates. Reset password. M25 cable gland cable diameter 16mm->17mm.	AHa
1.2	15.5.2018	Product versions added (chapter 3.1). Wiring picture updated.	AHa

## 2 ABOUT THIS DOCUMENT

This document describes the Obelux Control Panel (CP) operation for the end-user. This document covers the installation and setup of the CP unit, use of graphical user interface and operation of the unit on a practical level. This document is intended for everyone who needs to install and setup a CP unit for operation.

LHC	Light Head Controller Unit
COM	Controller Module of the CP
CP	Control Panel
GUI	Graphical User Interface
GPS	Global Positioning System

Table 1: Acronyms and Abbreviations

### 3 ABOUT THIS PRODUCT

Control panel is used to control and monitor Obelux Light Head Controllers (LHC) and Light Heads. Control panel offers full system management for devices that are connected to the same network. CP has a user-friendly color LCD screen for accessing the system locally. The CP also works as a web server so that the system monitoring can be also done via web browser

The main component of the CP is the Controller Module (COM). The COM communicates with the connected light heads to synchronize the flashing of the lights, providing time of day information and collecting the statuses of the lights. Status reporting is done with an alarm relay output, or optionally with a web server. The controller module is used in several Obelux products, and some of the connectors and features are not used in the Control Panel application.

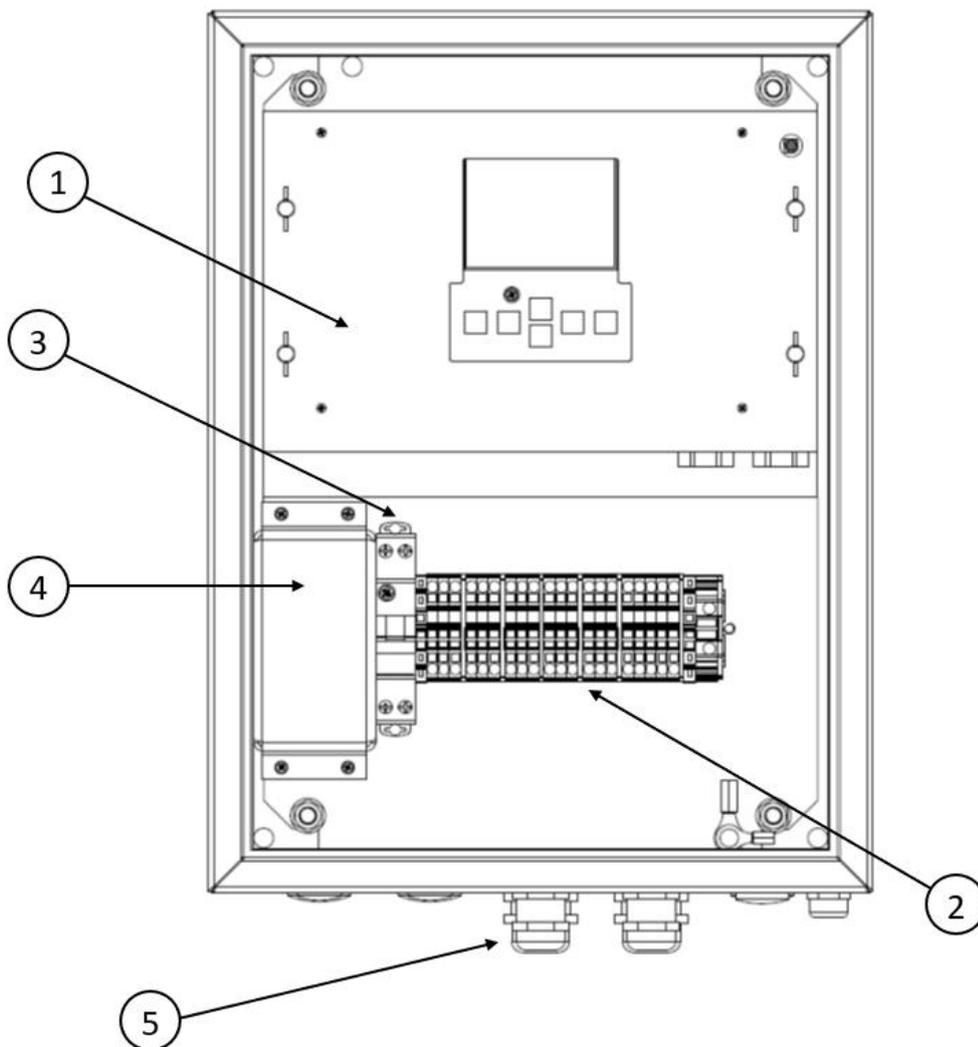


Figure 1: Main functional parts of the control panel

1. Controller module (COM)
2. Terminal block connectors
3. Circuit breaker
4. Over voltage protectors
5. Cable glands

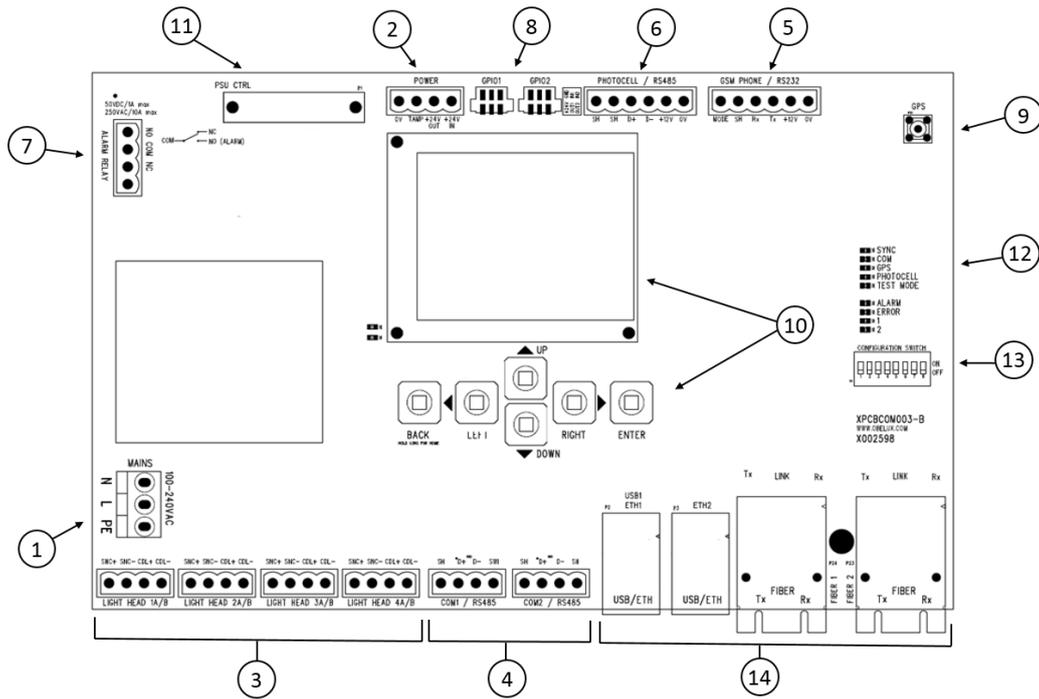


Figure 2: Controller module

1. Main power feed
2. COM board Power
3. LHC Output connectors (sectors)
4. RS-485 communication connectors
5. External GSM modem connector
6. External photocell connector
7. Alarm relay connector
8. GPIO connectors
9. GPS antenna connector
10. Display and keyboard
11. PSM control connector
12. Status LED indicators
13. Configuration DIP switches (not used in this application)
14. Ethernet LAN connectors (RJ45 and Optic Fibre SC)

The controller module is used in several Obelux products, and some of the connectors and features are not used in the Control Panel application. Most of the needed connections are wired to the terminal blocks below the Controller module.

### 3.1 Versions

Obelux CP is available as the following models:

Order code	Input Voltage	Weight	Cabin material	Dimensions (L x W x D)
CP-ACW-XXX-A3	100-240Vac	<11kg	Painted steel	400 x 300 x 200 mm
CP-ACW-XXX-B3	100-240Vac	<11kg	Acidproof steel	400 x 300 x 200 mm

**XXX :** F = Optic fiber connection  
W = Web server  
G = GPS synchronization

## 4 SAFETY INSTRUCTIONS

In this section you will find general safety instruction for the device. Please read the instructions carefully before installing or using the device to avoid any personal, environmental or material damages.

### 4.1 General considerations

Install device observing manufactures installation guide

Use only cables and connectors specified by the manufacture

Keep your device away from heat sources, dust, smoke or other harmful substances

Do not add or remove any components inside the device unless otherwise approved by the manufacture

Do not spill food or other liquids on device

If you have any error situation with the device, do not try to fix it by yourself, contact your reseller.

### 4.2 Environmental considerations

The European Parliament and the Council of European Union issued directive 2012/19/EU to contribute to sustainable production and consumption by, as a first priority, the prevention of WEEE and, in addition, by the re-use, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste and to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials.

Obelux aviation obstacle light products sold inside European Union can be returned to manufacturer if no local WEEE separate collection and re-use services are available. Please contact Obelux for details.

Obelux does not refurbish returned items but forwards them to authorized WEEE treatment facility.

### 4.3 Personal considerations

**HIGH VOLTAGE!** Device contains high voltage which is very dangerous to human beings. Any direct contact to high voltage could lead to serious injury, worst case even death.



## 5 INSTALLATION

### 5.1 Device installation

Mount the device to the selected mounting point using quality made fasteners. When the cabin door is open, check that there is no inflow of water (incl. hail and snow) into the cabinet.

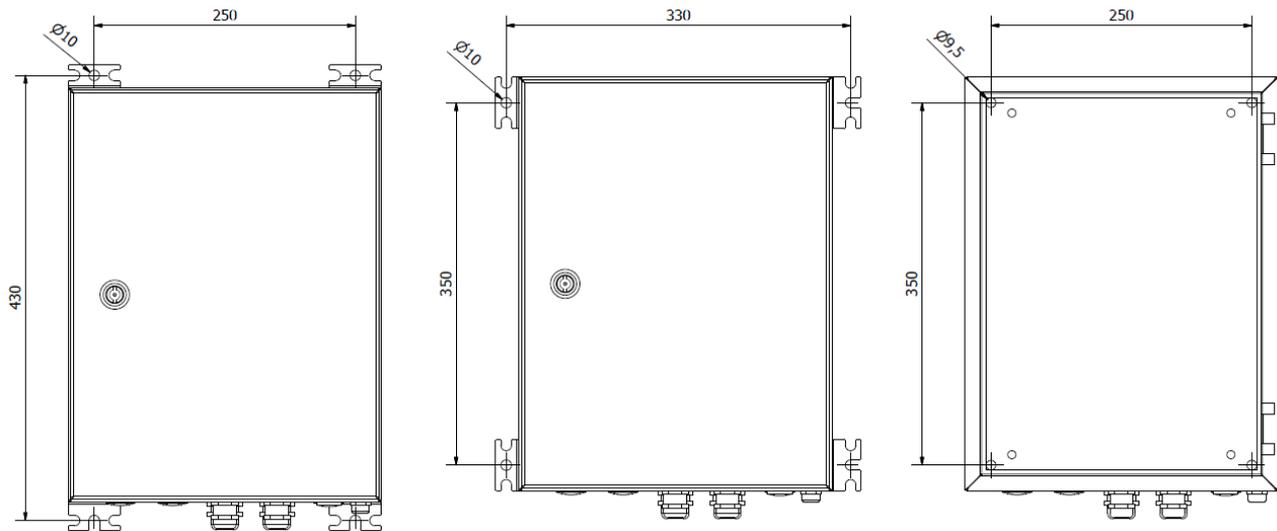


Figure 3: Cabin dimensions

### 5.2 Wiring

Route cables using cable glands on the bottom side of the controller. Connect the cable wires securely to appropriate terminal block connectors. There are two different size cable glands used on the cabin. Follow the illustration below to achieve desired EMC protection with the EMC glands:

Cable gland M25 for 11-17 mm cable diameter

Cable gland M20 for 9-13 mm cable diameter



Please follow these instructions when routing cable via a cable gland:

1. Partially expose the braided screen by removing the outer sheath of the cable at a length of approx. 10 mm.
2. Insert the cable through the dome nut and the gland body until the contact spring is pressed against the braided screen.

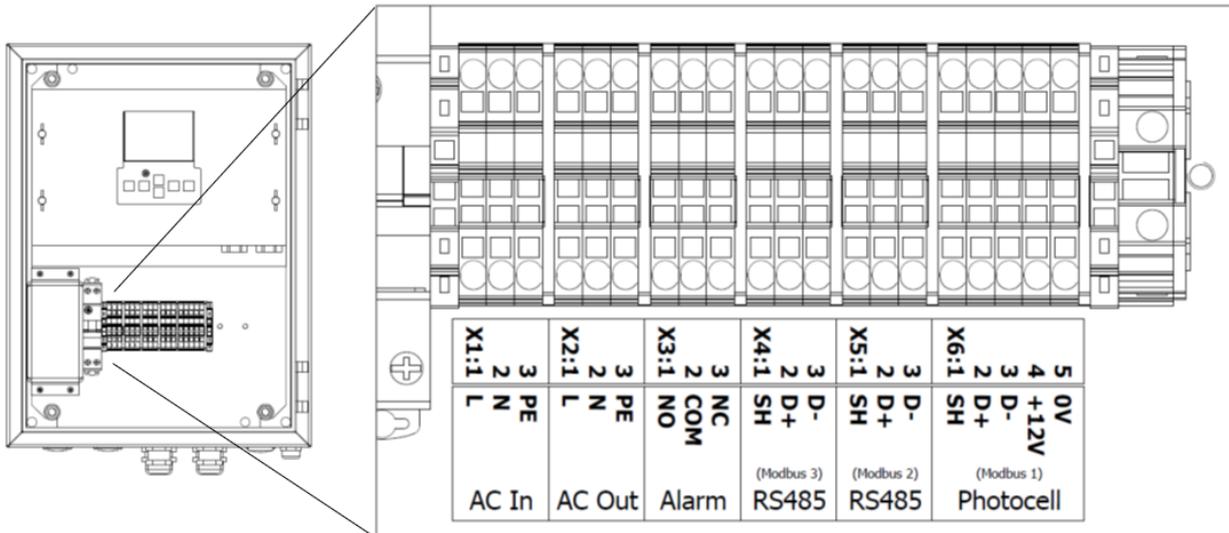


Figure 4: Control Panel connectors

### 5.2.1 AC In

Number	Mark	Description	Information
X1:1	L	Live terminal	Colour typically brown.
X1:2	N	Neutral terminal	Colour typically blue.
X1:3	PE	Protective earth	PE line is typically indicated with yellow/green colour.

Connector is push in terminal block.

**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>

### 5.2.2 AC Out

Number	Mark	Description	Information
X2:1	L	Live terminal	Colour typically brown.
X2:2	N	Neutral terminal	Colour typically blue.
X2:3	PE	Protective earth	PE line is typically indicated with yellow/green colour.

Connector is push in terminal block.

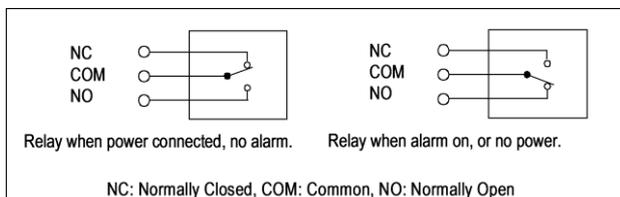
**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>

### 5.2.3 Alarm

Number	Mark	Description	Information
X3:1	NO	Normally Open	In alarm, connected with COM
X3:2	COM	Common	Common relay contact
X3:3	NC	Normally Closed	During normal operations, connected with COM

Unused alarm relay connectors can be left floating i.e. no wiring there is required. When is without power and when it starts (reboots), the relay signals an alarm. Alarm relay state changes during start-up process if there are no pending alarms to be signalled. Connector is push in terminal block.

**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>



#### 5.2.4 RS485 Communication – Modbus 3

Number	Mark	Description	Information
X4:1	<b>SH</b>	Shield	Shield
X4:2	<b>D+</b>	Data+	RS485 non-inverting pin
X4:3	<b>D-</b>	Data-	RS485 inverting pin

RS-485 bus is implemented with one pair. Therefore, communication on RS-485 bus is half-duplex. Connector is push in terminal block.

**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>

#### 5.2.5 RS485 Communication – Modbus 2

Number	Mark	Description	Information
X5:1	<b>SH</b>	Shield	Shield
X5:2	<b>D+</b>	Data+	RS485 non-inverting pin
X5:3	<b>D-</b>	Data-	RS485 inverting pin

RS-485 bus is implemented with one pair. Therefore, communication on RS-485 bus is half-duplex. Connector is push in terminal block.

**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>

#### 5.2.6 Photocell

Number	Mark	Description	Information
X6:1	<b>SH</b>	Shield	Shield
X6:2	<b>D+</b>	Data+	RS485 non-inverting pin
X6:3	<b>D-</b>	Data-	RS485 inverting pin
X6:4	<b>+12V</b>	+12V	12V voltage
X6:5	<b>0V</b>	0V v	0V voltage

Connector is push in terminal block.

**Conductor cross-section** 0.2mm<sup>2</sup> - 2.5mm<sup>2</sup>

#### 5.2.7 GPS Antenna

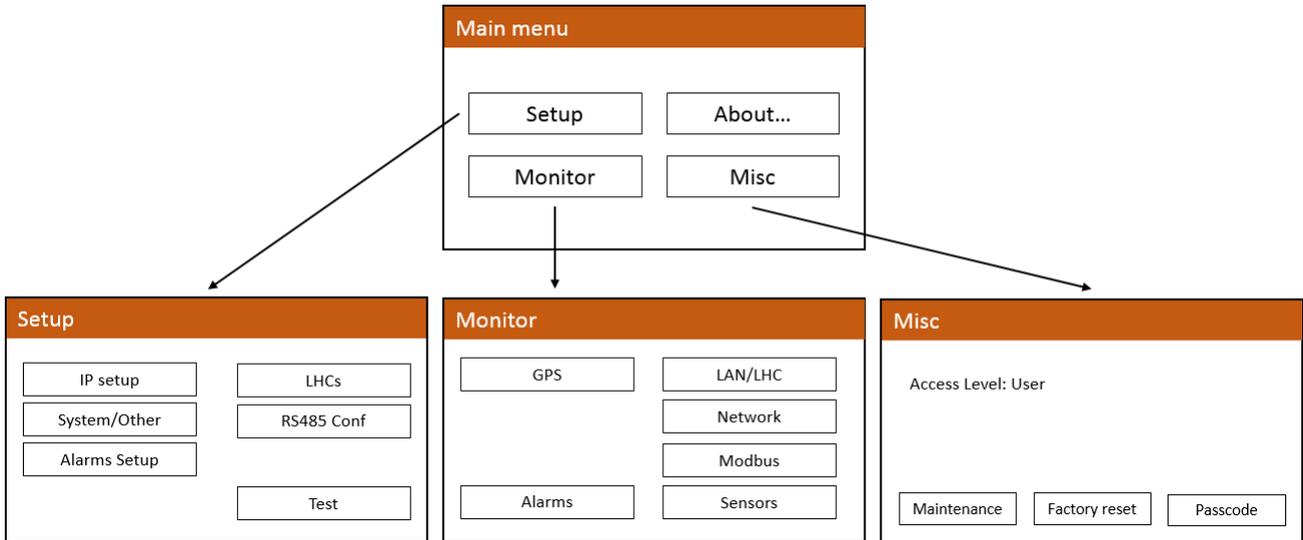
Antenna is connected to the SMA connector on the COM board. Connector location can be seen in the [Figure 2](#). Be careful not to overtighten the connector.

#### 5.2.8 Ethernet LAN connectors

Ethernet LAN ports. Two RJ-45 connectors and two optic fibre SC type connectors. Both connectors are on the COM board. Connector location can be seen in the [Figure 2](#).

## 6 CONFIGURATION

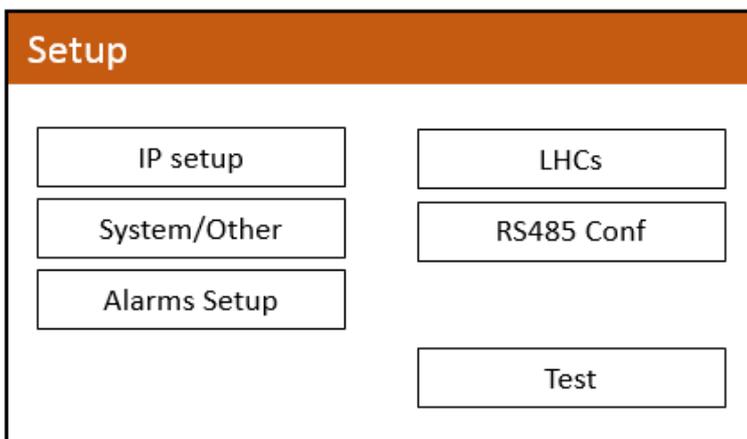
This chapter describes the configuration of the CP. The configuration is carried out with COM board’s keyboard and display. DIP switches are not used. Arrow buttons on the COM board are used to move in the menus. Enter button selects a menu and back button returns to the previous menu.



The CP functionality is divided mainly in to two sub-menus. From Setup menu the user can do all system configuration related tasks. In the Monitor sub-menu, the user can monitor the system status including possible faults.

### 6.1 Setup menu

From the setup menu user can setup IP address, setup LCH units, change system settings and enable or disable alarm sources. Modbus light heads are configured in the RS485 Conf. menu. Test menu contains several test modes to test system installation and functionality.



### 6.1.1 IP setup

Ethernet settings for the Control Panel are set from IP setup menu. Select Apply to confirm settings. If you change the DHCP setting you must reset Control Panel by switching off its power. This can be done with the reboot button from the same menu. The IP address can be checked from the Monitor / Network menu.

IP Setup	
DHCP	OFF
IP	192.168.100.252
Netmask	255.255.255.0
Gateway	192.168.100.1
Reboot	

### 6.1.2 LHCs

LHC slave units are added to the Control Panel from the LHCs menu. Add LAN slave units IP address to an empty slot on the menu.

LAN Slave Setup	
1. Empty	9. Empty
2. Empty	10. Empty
3. Empty	11. Empty
4. Empty	12. Empty
5. Empty	13. Empty
6. Empty	14. Empty
7. Empty	15. Empty
8. Empty	16. Empty

### 6.1.3 System / Other

From the system menu you can change photocell, visibility sensor and flash rate settings.

System / Other			
Photocell input	Modbus	Address	Bus1-1
Light limits	Night: <200 Day: >1600		
Vsen	None		
FPM Day	40fpm	FPM Night	40fpm
Flen. Day	100ms	Flen. Night	500ms

#### Photocell input

Photocell input options are the following;

None; No photocell

Modbus; CP is reading data from light head connected in to the Modbus1 connectors.

Local; A dedicated Obelux photocell is connected to the Photocell connectors.

#### Address

Photocell address if Modbus input is selected. Bus1-1 = Modbus 1, address 1

#### Light limits

Photocell ambient light limits [lux] for night and day can be selected from this menu.

#### Vsen

Visibility sensor can be enabled and disabled from this menu.

#### FPM Day/Night

This menu lets you select the flashing rate for the day mode.

#### Flen. Day/Night

This menu lets you select the flash length for day and night mode.

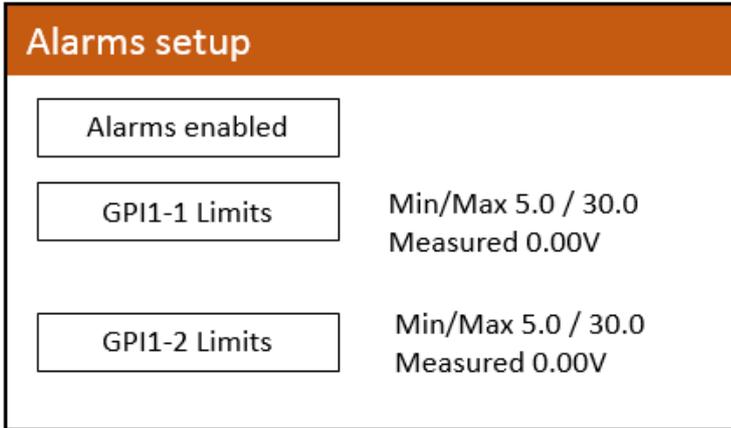
### 6.1.4 RS485 Conf

Aviation lights connected directly to the CP with RS485 (Modbus) are configured from the RS485 Conf menu. Select the number of lights that are connected to the bus. After this select the type of the light from the next menu. If you add a visibility sensor to the RS232 bus you add it to the Vis. Sens. part of the menu. Select Apply setup to confirm your selection.

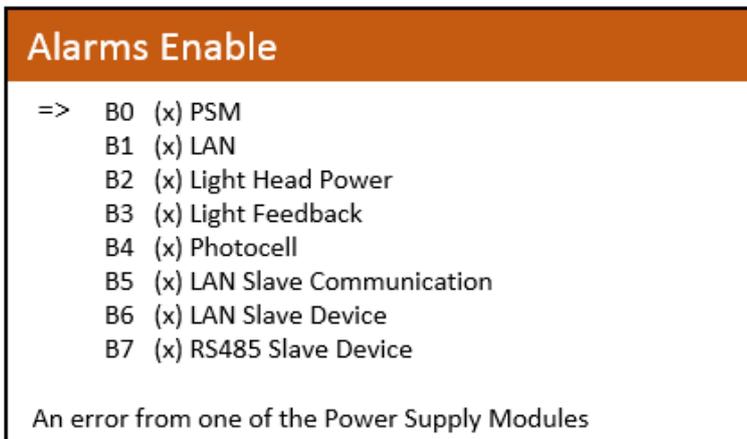
Config Intntl. -ICAO		
Modbus1	0	None
Modbus2	0	None
Modbus3	0	None
Vis. Sens.	0	--
Apply setup		

### 6.1.5 Alarms setup

From the Alarms setup menu, the user can enable or disable certain alarm sources. It is not typically necessary to adjust the alarm settings.



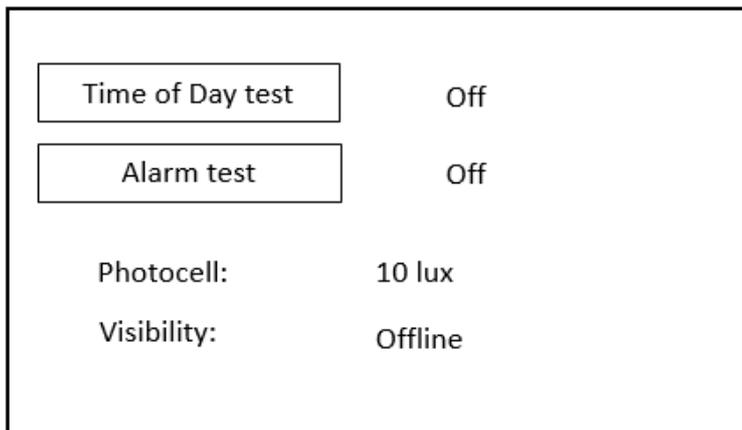
To disable an alarm source, uncheck the (x) mark in front of the alarm name with the Enter button. Alarm source is described in more detail in the bottom of the screen. All the alarm sources might not be relevant to the Control Panel.



<b>B0 PSM</b>	An error from one of the Power Supply Modules
<b>B1 LAN</b>	HTTP server or LAN error
<b>B2 Light Head Power</b>	Light head power draw is erroneous
<b>B3 Light Feedback</b>	Light head may not be lit up correctly
<b>B4 Photocell</b>	Photocell is not working properly
<b>B5 LAN Slave Communication</b>	LAN Slave device is not answering calls
<b>B6 LAN Slave Device</b>	LAN Slave device has an error condition
<b>B7 RS485 Slave Device</b>	RS485 Slave device has an error condition
<b>B8 RS485 Communication</b>	RS485 bus communication fault
<b>B9 LH Life 80</b>	Light Head is at 80% of specified usage hours
<b>B10 LH Life 100</b>	Light Head is at 100% of specified usage hours
<b>B11 GPI1-1</b>	Voltage of GPI is out of range
<b>B12 GPI1-2</b>	Voltage of GPI is out of range
<b>B13 Visibility Sens.</b>	Visibility sensor malfunction
<b>B14 Modem</b>	GSM/GPRS/3G modem malfunction

### 6.1.6 Test menu

The Control Panel includes several test modes to test system installation and functionality. Active test modes are disabled after 24 hours. In other words, the CP will return to normal operation after 24 hours. The menu also displays data and status of the photocell and visibility sensor.



#### Time of Day test

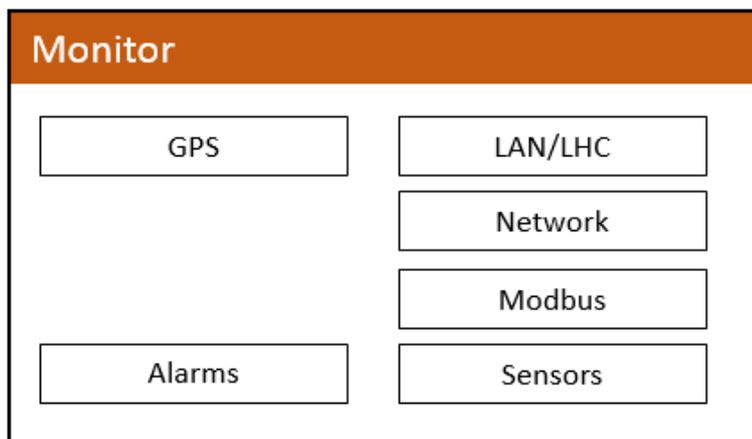
In Time of Day test mode, you can set the lights to day, twilight or night intensity.

#### Alarm test

Alarm test activates alarm relay(s).

### 6.2 Monitor menu

From monitor menu you can monitor the system status and possible alarms.



#### 6.2.1 GPS

GPS menu shows data of the GPS module on the Control Panel. On GPS sub-menu there is a list about GPS information received from GPS satellite. In list current date and time (UTC) is shown. Also, receiver location in latitude and longitude is shown. GPS status can be one of the following:

- GPS not installed; GPS module is not installed
- GPS Error; GPS receiver not responding
- GPS No Fix; insufficient signal for GPS fix
- GPS OK; GPS module working and has GPS fix

## **6.2.2 Alarms**

Menu displays alarm status of the Control Panel. Clear button will clear old alarms (OK\* → OK). Alarm status can be one of the following:

OK; No alarm  
Warning; Close to alarm limit  
Fault; Alarm Active from subsystem  
OK\*; Subsystem has had an alarm. Alarm condition has since disappeared.

## **6.2.3 LAN/LHC**

On LAN/LHC status sub-menu there is a list of the connected LHCs and their status information including alarms.

## **6.2.4 Network**

On network status sub-menu there is a list about the Control Panel network settings and status. List shows CP IP address, subnet mask and default gateway.

GC link; Global Controller is connected to this device  
Time RX; Device is receiving network time broadcast

## **6.2.5 Modbus**

On Modbus sub-menu there is a list of devices connected to the Modbus connectors and their status information including alarms. More information is available by selecting the device from the list.

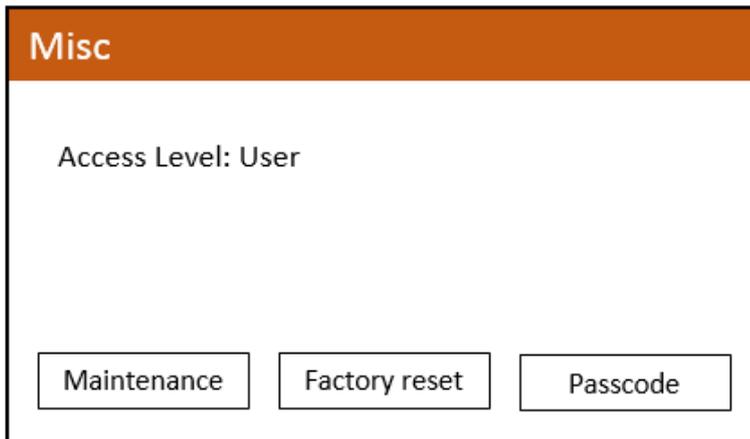
## **6.2.6 Sensors**

On Sensors sub-menu there is information about the photocell and visibility sensors.

### 6.3 Misc menu

Contents of the *Maintenance* menu is not covered in this manual. Accessing this menu is necessary only in special cases. Obelux can provide more information about this menu if needed.

*Factory reset* button will reset the CP to its factory settings. Factory reset is only available if DIP 7 and DIP8 are switched ON from the Control Panel DIP switches. Special CP functionality is not available for the normal user. Entering a valid passcode will give access to these settings.



### 6.4 About menu

About menu shows different information about control panel SW version and copyright.

## 7 OPERATION

The CP consists in one major component, Controller Module (COM). COM communicates with Light heads connected to the RS485 bus and LHCs via Ethernet to synchronize internal clock, providing time of day information and collecting statuses. Status reporting is done with alarm relay output or Web API.

### 7.1 Start-up

The CP software makes series of start-up initializations when system is powered on. All status LED indicators are set on and off during start-up process. Start-up takes few seconds.

### 7.2 Time synchronization

The CP provides time synchronization information via Ethernet for all LHCs connected to same network. Information is sent with broadcast message so all LHCs get the information at the same time. Time synchronization message is sent with 10 seconds interval.

When a GPS module is installed with appropriate antenna, the CP synchronizes its clock to GPS time (UTC) and provides that to all LHC units to flash simultaneously all over the world. The timing difference from one system to another is less than  $\pm 2$  millisecond depending on network latency.

### 7.3 Time of day synchronization and photocell

Luminance information is read from the photocell. Photocell measures the ambient light in lux. Depending on the ambient light level CP changes the aviation lights between day, twilight and night modes. Time of day information is sent with 10 seconds interval. Different thresholds for day, twilight and night modes can be set from the Setup/System menu.

### 7.4 Status collection and reporting

The CP unit collects LHCs statuses and reports possible errors via alarm relay output or Web API. GUI can be used to see more detail; which LHC is causing the alarm and why. Also on board status LEDs indicate system status. Status collection is done with 60 seconds interval via Ethernet. All the possible alarms are listed below.

<b>B0 PSM</b>	An error from one of the Power Supply Modules
<b>B1 LAN</b>	HTTP server or LAN error
<b>B2 Light Head Power</b>	Light head power draw is erroneous
<b>B3 Light Feedback</b>	Light head may not be lit up correctly
<b>B4 Photocell</b>	Photocell is not working properly
<b>B5 LAN Slave Communication</b>	LAN Slave device is not answering calls
<b>B6 LAN Slave Device</b>	LAN Slave device has an error condition
<b>B7 Modbus Slave Device</b>	RS485 Slave device has an error condition
<b>B8 Modbus Communication</b>	RS485 bus communication fault
<b>B9 LH Life 80</b>	Light Head is at 80% of specified usage hours
<b>B10 LH Life 100</b>	Light Head is at 100% of specified usage hours
<b>B11 GPI1-1</b>	Voltage of GPI is out pf range
<b>B12 GPI1-2</b>	Voltage of GPI is out of range
<b>B13 Visibility Sens.</b>	Visibility sensor malfunction
<b>B14 Modem</b>	GSM/GPRS/3G modem malfunction

## 7.5 Status LEDs

This chapter describes the behavior of the on-board status LED indicators during normal and alarm situation.

### **SYNC**

This LED will flash in sync with light heads.

### **COM (Green)**

This LED indicates data communication status between Control Panel and LHCs. If there is an error in communication, LED will be set on along with the ALARM LED.

### **GPS (Green)**

This LED indicates GPS operation status. In normal operation this LED is off if GPS is disabled. If GPS is enabled and the signal is detected, LED is set on. It may take few minutes to detect GPS signal. If GPS signal is lost or valid UTC time is not received, LED will be switched off.

### **PHOTOCELL (Green)**

This LED indicates that photocell is connected and working

### **ALARM (Red)**

Alarm led is used when there is an active alarm

### **ERROR (Red)**

Error LED is used to indicate that one of the alarm sources is close to an alarm limit

### **TEST MODE, 1, 2**

Not used