USER MANUAL

This User Manual applies to following Obelux SAL aviation obstruction lights having software version 3.1:

Obelux MI-20KW	**Obelux HI-50KW**
Obelux MI-20KW-x-A	Obelux HI-50KW-x-A
Obelux MI-20KWD-x-A	Obelux HI-50KWD-x-A

Table of contents

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

1 Overview

Obelux MI-20KW-x-A is aviation obstruction light product to customers needing an obstruction light that provides 20 000 cd white and can provide 2 000 cd red (model MI-20KWD-x-A) and/or infrared beacons in the same unit with factory-installed options. White light can be dimmed in night mode.

Respectively, Obelux HI-50KW-x-A is aviation obstruction light product to customers needing an obstruction light that provides 50 000 cd white and can provide 1 000 cd red (model HI-50KWD-x-A) and/or infrared beacons in the same unit with factory-installed options. White light can be dimmed in twilight and night modes.

Replace –x- with operating voltage. Values are presented in tables below.

2 Models

2.1 Medium Intensity

2.1.1 20 000 cd white

This obstruction light is available in following configurations:

Light output: 20 000 cd white	
Voltage	**Obelux product code**
100 V AC	Obelux MI-20KW-100-A
115 V AC	Obelux MI-20KW-115-A
200 V AC	Obelux MI-20KW-200-A
230 V AC	Obelux MI-20KW-230-A

Obelux MI-20KW-x-A, being a 20 000 cd product, meets the light output specifications of ICAO Medium Intensity Type A and FAA L-865, L-866.

ICAO Medium Intensity, Type A (flash rate 20 – 60 fpm) FAA Medium Intensity, Type L-865 (flash rate 40 fpm) FAA Medium Intensity, Type L-866 (flash rate 60 fpm)	
Mode	**Light output**
Day	20 000 cd ± 25% flashing white
Twilight	20 000 cd ± 25% flashing white
Night	2 000 cd ± 25% flashing white

2.1.2 20 000 cd white and 2 000 cd red

This obstruction light is available in following configurations:

Light output: 20 000 cd white and 2 000 cd red	
Voltage	**Obelux product code**
100 V AC	Obelux MI-20KWD-100-A
115 V AC	Obelux MI-20KWD-115-A
200 V AC	Obelux MI-20KWD-200-A
230 V AC	Obelux MI-20KWD-230-A

Obelux MI-20KWD-x-A meets the following light output specifications (user-selectable):

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

ICAO Medium Intensity, Type A (flash rate 20 – 60 fpm) FAA Medium Intensity, Type L-865 (flash rate 40 fpm) FAA Medium Intensity, Type L-866 (flash rate 60 fpm)	
Mode	**Light output**
Day	20 000 cd ± 25% flashing white
Twilight	20 000 cd ± 25% flashing white
Night	2 000 cd ± 25% flashing white

ICAO Medium Intensity, Type B (flash rate 20 – 60 fpm) FAA Medium Intensity, Type L-864 (flash rate 20-40 fpm) FAA Medium Intensity, Type L-885 (flash rate 60 fpm)	
Mode	**Light output**
Day	N/A
Twilight	N/A
Night	2 000 cd ± 25% flashing red

ICAO Medium Intensity, Type C	
Mode	**Light output**
Day	N/A
Twilight	N/A
Night	2 000 cd ± 25% fixed red (“steady burning”)

2.2 High Intensity

2.2.1 50 000 cd white

Obelux HI-50KW-x-A is high-Intensity obstruction light designed especially for wind-mill applications where civil aviation authority for aviation security allows using two (or more) 50 000 cd units instead of one 100 000 cd unit. This product is a replacement to 100,000 cd high intensity aviation obstruction light only in cases where local authority allows using two or more 50 000 cd (white) obstruction lights instead of 100 000 cd (white) obstruction light.

With two or more HI-50KW obstruction lights, this product conforms to performance required from ICAO High Intensity Type B and it meets regulations set by Finnish Civil Aviation Authority (part of Finnish Transport Safety Agency).

Light output: 50 000 cd white	
Voltage	**Obelux product code**
100 V_{AC}	Obelux HI-50KW-100-A
115 V_{AC}	Obelux HI-50KW-115-A
200 V_{AC}	Obelux HI-50KW-200-A
230 V_{AC}	Obelux HI-50KW-230-A

2.2.2 50 000 cd white and 1 000 cd red

This obstruction light is available in following configurations:

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

Light output: 50 000 cd white and 1 000 cd red	
Voltage	**Obelux product code**
100 V AC	Obelux HI-50KWD-100-A
115 V AC	Obelux HI-50KWD-115-A
200 V AC	Obelux HI-50KWD-200-A
230 V AC	Obelux HI-50KWD-230-A

Like HI-50KW-x-A, with two or more HI-50KW obstruction lights, this product conforms to performance required from ICAO High Intensity Type B and it conforms to regulations issued by Finnish Transport Safety Agency.

Obelux HI-50KWD-x-A meets the following light output specifications:

[TraFi - Finland]	
Mode	**Light output**
Day	50 000 cd ± 25% flashing white
Twilight	10 000 cd ± 25% flashing white
Night	1 000 cd ± 25% flashing white

Mode	**Light output**
Day	N/A
Twilight	N/A
Night	1 000 cd ± 25% flashing red

Mode	**Light output**
Day	N/A
Twilight	N/A
Night	1 000 cd ± 25% fixed red (“steady burning”)

2.3 Common elements in all models

No external controllers are required to install and run these products. In most use cases, mounting the standalone aviation obstruction light and connecting power supply cable are the only actions needed to operate this light.

These models come with built-in photocell that can drive the transitions between day, twilight and night modes. In some ICAO aviation obstruction light types, twilight mode is not specified and day mode is used until night.

Various operating modes and responses to parameters are realised using embedded microcontroller on the controller card.

These Obelux aviation obstruction lights are Class 2M LED device. This class is safe for accidental viewing under all operating conditions. However, it may not be eye-safe for a person who deliberately stares into the LED beam by overcoming their natural aversion response to the very bright light.

3 Options

These Obelux standalone aviation obstruction lights can be extended with factory-installed options like GPS synchronisation, Ethernet/IP interface and infrared LEDs. Infrared LEDs are typically used to achieve NVG compatibility.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

GPS synchronisation is an industry-wide solution to make aviation obstruction lights to synchronise their flashing regardless of location. These models can even be controlled and monitored from a remote control room using optional Ethernet/IP interface.

Factory-installable options available:

For Obelux MI-20KW-x-A	
Option	**Added functionality**
OPT-GPS-20KW-A	GPS Receiver
OPT-IR-20KW-A	Infrared (855 nm)
OPT-LAN-20KW-A	Ethernet/IP interface

For Obelux MI-20KWD-x-A	
Option	**Added functionality**
OPT-GPS-20KWD-A	GPS Receiver
OPT-IR-20KWD-A	Infrared (855 nm)
OPT-LAN-20KWD-A	Ethernet/IP interface

For Obelux HI-50KW-x-A	
Option	**Added functionality**
OPT-GPS-50KW-A	GPS Receiver
OPT-IR-50KW-A	Infrared (855 nm)
OPT-LAN-50KW-A	Ethernet/IP interface

For Obelux HI-50KWD-x-A	
Option	**Added functionality**
OPT-GPS-50KWD-A	GPS Receiver
OPT-IR-50KWD-A	Infrared (855 nm)
OPT-LAN-50KWD-A	Ethernet/IP interface

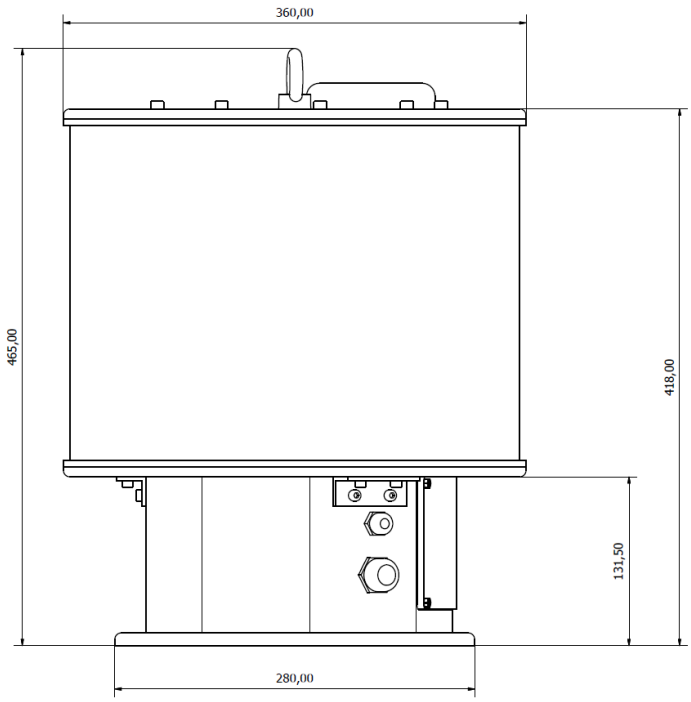
Options are ordered together with the aviation obstruction light.

Installing OPT-IR makes this product compliant with NVGs (Night Vision Goggles).

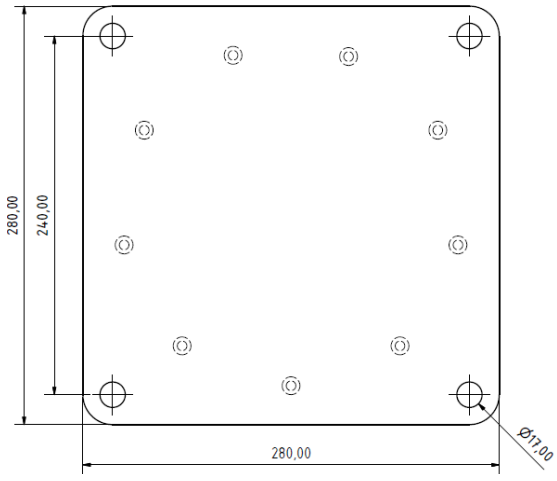
4 Dimensions

All dimensions stated in illustrations are in millimetres (mm).

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com



Mechanical dimensions

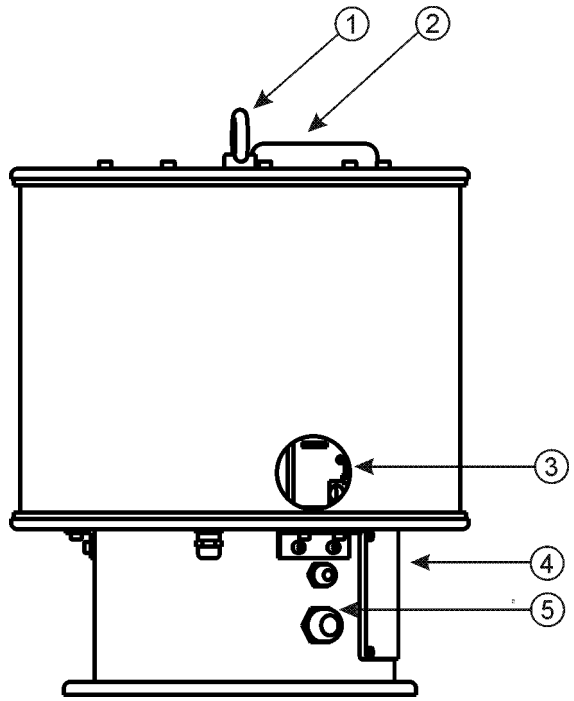


Mechanical dimensions – Mounting plate

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

5 Parts

User-accessible parts are illustrated and explained in the table below. These parts are accessible through the service access hatch on the lower chassis area.

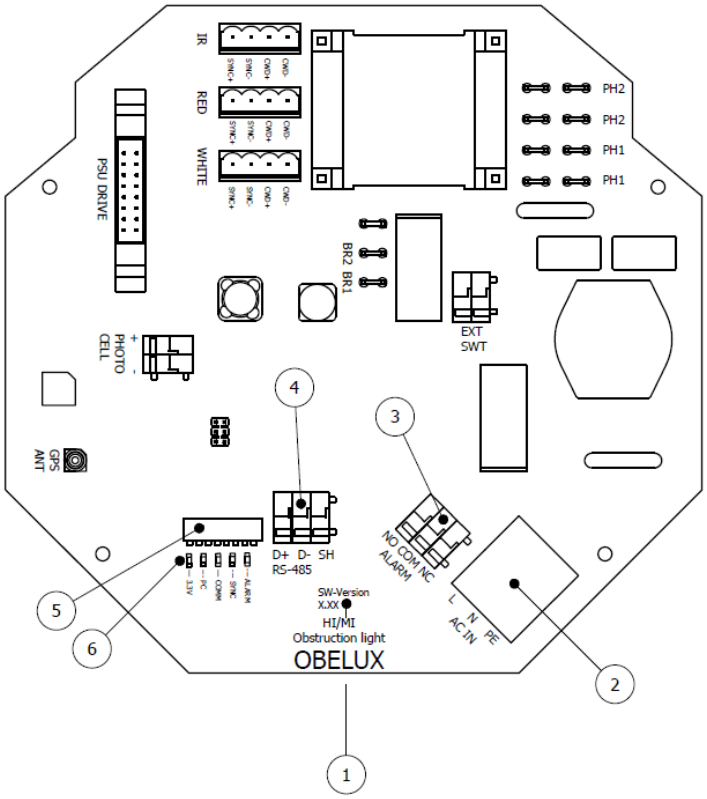


No.	Part
1	Lug (for lifting the light)
2	GPS Antenna
3	Location of photocell
4	Service access hatch
5	Cable glands (2 pcs) M16 (1 pc) M25 (1 pc)

Connectors on the system board are designed to house mains power supply wires of size up to 4(6) mm^2 nominal cross section and communications cable wires of size up to 1.5 mm^2. Power supply cable wires are secured using screw terminals; the communication cable wires are secured using spring-cage clamp terminals.

To release wire from terminal block, push the orange lever on top of connector chassis backwards to open the terminal. A slot head screwdriver is recommended.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com



Controller board

1	Software version label
2	Mains power supply connector (Single-phase supply with Protective Earth)
3	Alarm relay connector
4	Communications network connector (RS-485 or Ethernet/IP RJ-45)
5	External signal input connector
6	Configuration DIP switches (1-10)
7	Status LEDs

6 Options

Obstruction light may have factory-installed Ethernet/IP and/or GPS options already mounted on the controller board.

6.1 Ethernet/IP network

Ethernet/IP option replaces RS-485; if Ethernet/IP is equipped, the RS-485 is unavailable. Ethernet/IP enables remote control and monitoring without RS-485 bus, allowing longer distances and monitoring off-site.

6.2 GPS

GPS receiver makes it possible to synchronise obstruction lights to external clock (GPS time). This option is typically used in master units or non-networked lights to have all aviation obstruction lights to follow same flashing pattern. External GPS antenna is located on top of light.

6.3 Infrared

Obstruction light may have factory-installed Night Vision Goggles-compatible infrared LEDs.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

7 Installation

7.1 Verify model

Find the Obelux product label on the light and note the product model. It should state the light output and operating voltage of that particular light. Use the following information to decode Obelux product label information:

Product code (sample)

Obelux	MI	-	50KW	-	230	-	A
	1		2		3		4

1	Serie
HI	High Intensity
MI	Medium Intensity

2	Light output
20KW	20 000 cd white
20KWD	20 000 cd white and 2 000 cd red
50KW	50 000 cd white
50KWD	50 000 cd white and 1 000 cd red

3	Operating voltage (AC only)
100	100 V_{AC}
115	115 V_{AC}
200	200 V_{AC}
230	230 V_{AC}

4	Standalone
A	Standalone model

Using information on the product label, check and verify that the product matches supply voltage on the site. Incorrect voltage on the supply terminals can cause permanent damage on this device. Using incorrect supply voltage also voids the product warranty.

7.2 Configuration

Open all four (4) screws that secure the service access hatch to the chassis using a slot-head screwdriver. You do not need to remove the screws completely to open this hatch. Hatch is secured using a strap between hatch and chassis.

Using the DIP switches visible and accessible via service access opening, configure the desired parameters into standalone light. To configure this light the following parameters shall be set according to the local regulations and permit:

- Operating mode during night time (e.g. ICAO Medium-Intensity Type B: flashing-red, Type C: fixed-red)
- Flash rate (flashes per minute)

DIP switch #9 is unused.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

DIP switch #10 controls RS-485 communication bus termination. When this DIP switch is turned ON (i.e. facing up), the 120Ω termination resistor is connected to the RS-485 bus on the controller board.

DIP switches are numbered 1-10, the lowest number (1) being on the leftmost edge of the red/white DIP switch block looked from service access door.

Embedded software in the obstruction light reads configuration switches regularly. Configuration change becomes effective within few seconds.

7.2.1 Light

The controller board shall be configured according to the hardware installed in the aviation obstruction light i.e. as the aviation obstruction light has been manufactured.

Some alternatives in the table below may be inapplicable to a certain product (i.e. 20 000 cd light MI-20KW cannot operate as HI-50KW providing 50 000 cd light and fulfilling requirements). Make sure that you return the proper configuration setting in case test mode (explained below) has been engaged and required tests have been carried out.

DIP switch			Light
1	2	3	
off down	off down	off down	**MI-20KW** 20 000 cd white (flashing)
on up	off down	off down	**MI-20KWD** 20 000 cd white (flashing) and 2 000 cd red
off down	on up	off down	**MI-20KW with OPT-IR-20KW-A** 20 000 cd white (flashing) and infrared
on up	on up	off down	**MI-20KWD with OPT-IR-20KWD-A** 20 000 cd white (flashing), 2 000 cd red and infrared

The red light on MI-20KWD is disabled when DIP switch #1 is off.

DIP switch			Light
1	2	3	
off down	off down	on up	**HI-50KW** 50 000 cd white (flashing)
on up	off down	on up	**HI-50KWD** 50 000 cd white (flashing) and 1 000 cd red
off down	on up	on up	**HI-50KW with OPT-IR-50KW-A** 50 000 cd white (flashing) and infrared
on up	on up	on up	**HI-50KWD with OPT-IR-50KWD-A** 50 000 cd white (flashing), 1 000 cd red and infrared

The red light on HI-50KWD is disabled when DIP switch #1 is off.

7.2.2 Flash rate

DIP switches #4 and #5 control the flash rate. Standard controller can run the light with following flash rates. Customer-specific flash rates are available on request.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

DIP Switch 4	DIP Switch 5	Flash rate	
off down	off down	20 fpm (flashes per minute); one flash in three seconds	
on up	off down	night mode (only)	30 fpm (flashes per minute); one flash in two seconds
		day and twilight mode	40 fpm (flashes per minute); one flash in every 1.5 seconds
off down	on up	40 fpm (flashes per minute); one flash in 1.5 seconds	
on up	on up	60 fpm (flashes per minute); one flash in every second	

7.2.3 Night mode parameters

Using DIP switch #6, the flashing mode for red (models MI-20KWD and HI-50KWD) and infra-red (models with OPT-IR) can be set.

DIP Switch 6	Night mode
off down	Red and infrared (IR) lights flash at the selected flash rate.
on up	Red and infrared (IR) lights are burning steady.

7.2.4 Device mode

Using DIP switch #8, the obstruction light can be set to operate as master in network. Only one obstruction light shall be master in a network domain.

Master unit broadcasts time and illumination data to slave units. Time is typically received from GPS and illumination information comes from photocell (internal or external). If the information flow from master unit to slave units is interrupted, the slave units will use local photocell setting and local clock (time) in their operations. As data flow resumes, the slaves automatically synchronise themselves with master unit.

DIP Switch 8	Device mode select
off down	This unit is a slave in the Obelux aviation obstruction lighting system/network.
on up	This unit is master in the Obelux aviation obstruction lighting system/network.

7.2.5 RS-485 bus termination

RS-485 bus should be terminated with on-board 120 ohm resistors on both ends of this communications bus.

DIP Switch 10	RS-485 termination
off down	RS-485 bus not terminated on controller board.
on up	RS-485 bus terminated to 120Ω on controller board.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

7.3 Mounting

7.3.1 Physical installation

Mount the obstruction light to selected mounting point using quality-made fasteners. This Obelux standalone aviation obstruction light comes with four bolt holes to mount this product securely.

Photocell is located under top lenses row. See illustration on page 8 for more information.

Level the light using spirit level (bubble level) if the mounting point is not already levelled. Tighten bolts & nuts. Obelux recommends 100 Nm tightening torque for M12 hot-dipped 8.8 bolts with suitable washer between bolt and mounting plate.

When the service access hatch (door) is open, check that there is no inflow of water (incl. hail and snow) into aviation obstacle light.

7.3.2 Cable routings

Route cables into aviation obstruction light using cable glands. The lower gland is M25 and upper gland is M16. Follow the illustration below to achieve desired EMC protection:

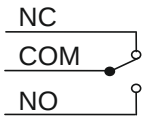
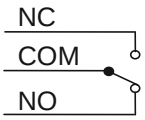
Illustration: EMC Cable Gland

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.
3. Firmly screw on dome nut.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

7.3.3 Alarm relay

	
Alarm relay during normal operation	Alarm relay during start-up, active alarm and/or during loss-of-power

When the controller board starts, after a short delay, the contacts NC (Normally Connected) and COM (Common) are short-circuited. During normal operation, terminals ALARM COM and ALARM NC are connected i.e. short-circuited. If an alarm is raised, ALARM COM and ALARM NO are short-circuited with the short-circuiting link between ALARM COM and ALARM NC is removed.

Note that the ALARM COM and ALARM NO are short-circuited when controller card is starting and running the start-up tests.

7.3.4 Wiring

Open the service access hatch.

Connect the RS-485 bus (if applicable), alarm relay cables (if applicable) and mains power supply cable wires securely to appropriate terminal block connectors. Route cables using cable glands on the right side of obstruction light. Note polarity.

7.3.4.1 Connectors - Mains power in

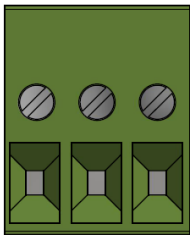
Mains power supply connectors (power input connectors) are marked with capital letters ‘L’, ‘N’ and ‘PE’. Their meaning is as follows:

Mark	Description	Information
L	Live terminal	Connect the mains power supply (in) into these screw connectors. Colours are typically brown (for Live) and blue (for Neutral)
N	Neutral terminal	
PE	Protective earth	Connect protective earth into this screw connector. PE line is typically indicated with yellow/green shield on the wire.

The wire diameters (cross-section of a conductor) are presented in the next table:

Mains power (N, L, PE)		
Conductor cross section solid and stranded min.	Conductor cross section solid max.	Conductor cross section stranded max.
0.5 mm^2	6 mm^2	4 mm^2

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com



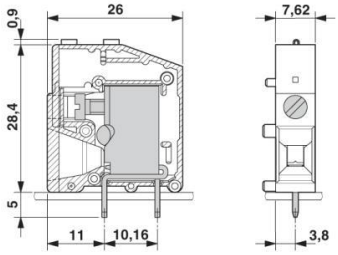


Illustration: PCB terminal block connector used with mains power interface

Recommended stripping length for Live, Neutral and Protective Earth wires is 14 mm.

Minimum AWG according to UL/CUL is 24 and maximum AWG is 10.

7.3.4.2 Connectors – Alarm and RS-485

Observe signal names when doing the wiring. RS-485 bus has polarity; Data(+) and Data(-) lines shall be connected in right order. Similarly, connect the alarm relay wires to COM, NC and NO as instructed by the manufacturer of the remote management system.

Mark	Description	Information
NC	Normally Open	In alarm, connected with COM (Common)
NO	Normally Connected	During normal operations, connected with COM (Common)
COM	Common	Common relay contact

The wire diameters (cross-section of a conductor) are presented in the next table:

Signal wires		
	Conductor cross section solid and stranded min.	Conductor cross section solid and stranded max.
Signals: Alarm	0.2 mm^2	1.5 mm^2
Signals: RS-485 bus	0.2 mm^2	1.5 mm^2

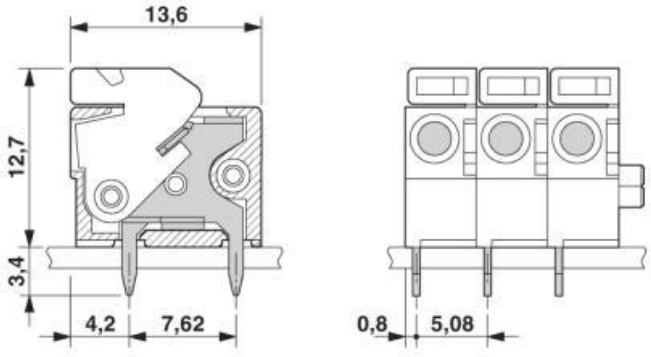


Illustration: PCB terminal block connector used with ALARM and RS-485 interfaces

Recommended stripping length is 10 mm.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

RS-485 bus is unavailable on standalone models having Ethernet/IP option installed. With this Ethernet option installed, use high-grade CAT5 (or better) Ethernet copper cable and RJ-45 connectors.

7.3.5 Testing

If needed, operations of the Obelux MI-20KW-x-A and HI-50KW-x-A lights can be tested using test mode. Further information is available on chapter 10 (see page 17). Restore normal operation mode when testing has been completed.

For testing, the mains power supply to the light must be available.

Ambient light is measured using photocell under glass cover on top of light. To avoid too frequent changes of intensity level, the new ambient light level must be constantly active for more than three minutes in normal operations mode. Test mode provides rapid feedback.

7.3.6 Post-installation actions

Place the service access hatch properly on its place and securely tighten all four screws on the corners of this hatch.

7.3.7 Power-On

The obstruction light starts with daytime intensity level. Depending on the light, the first flashes will be at 20 000 cd or 50 000 cd effective intensity. After three minutes, the intensity level can be decreased to twilight or night mode with information from photocell.

8 Status indications

Status indications are LEDs mounted on the controller board in front of configuration DIP switches. Some of the status indicators have three operating states (off, lit and blinking).

Indicators listed below follow their order (from left to right) on the controller board.

This Obelux standalone light has five (5) status LEDs on the controller board. These status LEDs are visible only when service access hatch is open.

Indicator Colour: Green	**3V3**
off	Power off.
on	Unit is powered on.

Indicator Colour: Green	**PC**
off	Photocell not in use
on	Day mode
blinking fast	Twilight mode
blinking slowly	Night mode

Indicator Colour: Green	**COMM**
off	Waiting for external signals.
on	Valid GPS signal is available.
blinking	Master-slave communications occurring on the network.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

Indicator Colour: Green	SYNC
off	All outputs are off.
on	At least one output is active.

Indicator Colour: Red	ALRM
off	Normal operation, no alarms.
on	Active alarm condition.

See chapter 9 for conditions when ALRM is active.

9 Causes for ALARM

The following events can cause ALRM to signal active alarm:

- Internal power failure
- Light source failure, including decreased intensity level below rated level of light
- Loss of synchronisation
- Loss of light status information in networked installations
- Incorrect photocell operation.

10 Testing

Using DIP switch #7, the obstruction light can be set to test mode. In test mode, the DIP switches take the meanings described here, replacing the default meaning described above.

Use test mode with caution while working with installed aviation obstruction light outdoors.

Before commencing test, the light must be powered on and configuration done according to light type. Turn DIP switch #7 from off (facing down) to on (facing up) to start unit testing.

DIP Switch 7	Test mode
off down	Normal operation.
on up	Test mode. Use with caution in live installations.

10.1.1 Functional test

When doing functional tests the light head test DIP switches (4-5, see next chapter) should be set to off. Similarly, during light head tests the functional test DIP switches 1-3 should be set to off.

While in test mode, the DIP switches have the following meaning:

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

DIP switch				Selected test
1	2	3	7	
off down	off down	off down	on up	**Off test** All lights off
on up	off down	off down	on up	**Night mode test** All lights set to night-time operation
off down	on up	off down	on up	**Twilight mode test** All lights set to twilight-time operation
on up	on up	off down	on up	**Day mode test** All lights set to daytime operation
off down	off down	on up	on up	**Photocell test** Photocell value read once in every second
on up	off down	on up	on up	**Communications test** Synchronisation messages sent to network
off down	on up	on up	on up	Reserved
on up	on up	on up	on up	Reserved

10.1.2 Light head test

Note that the amount of light output during the light head tests does not exactly match normal operation. The light head test modes should not be used when measuring the output intensity.

DIP switch			Light tests
4	5	7	
off down	off down	on up	Off test All lights off
on up	off down	on up	Turns on the white light, at approximately 10% power
off down	on up	on up	Turns on the red light, at approximately full power
on up	on up	on up	Turns on the IR light, at approximately full power

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

11 Configuration example

This example illustrates DIP switch settings for MI-20KW-x-A (flashing white 20 000 cd) that flashes once in every three seconds. Internal photocell controls mode selection (day, and night). During night mode, the white light output is reduced down to 2 000 cd.

DIP switch			Light type
1	2	3	
off down	off down	off down	**MI-20KW** 20 000 cd white (flashing)

DIP Switch		Flash rate
4	5	
off down	off down	20 fpm (flashes per minute); one flash in three seconds

DIP Switch 6	Night mode
off (down)	Not applicable

DIP Switch 7	Test mode
off (down)	Normal operation.

DIP Switch 8	Device mode select
off (down)	This unit is a slave in the Obelux aviation obstruction lighting system/network.

DIP Switch 9	Reserved
off (down)	

DIP Switch 10	RS-485 termination
off (down)	RS-485 bus termination resistor is not connected to RS-485 bus.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

12 Troubleshooting

Potential sources for errors during start-up are:

- No power (check that the 3V3 status LED is illuminated)
- Incorrect configuration (check DIP switches, make sure Test mode is turned off)
- Loose wires (check that all wires are properly seated in terminal block connectors)
- Too many RS-485 termination resistors (120 Ω) on the same RS-485 communication bus

This obstruction light is available for AC input, only. Do not attempt to use this equipment with DC supply.

Do not exceed maximum operating voltage. Mains power supply input is protected with overvoltage protection circuit that is tuned to stated operating voltage range.

Photocell is sampled once in a minute and read value are averaged to avoid sudden state changes. Unless test mode is enabled, it takes approx. three (3) minutes to change system state between day, twilight and night. These intensity steps are set in the factory.

GPS antenna is mounted on top of obstruction light. Antenna needs non-blocked view to GPS satellites in orbit. If the GPS synchronization cannot be gained, kindly check that the GPS antenna connector on the SALCOM board inside the aviation obstacle light is firmly connected and secured.

After start-up, GPS receiver may take some minutes to obtain correct time from GPS satellites. This operation requires data from more GPS satellites than the GPS received needs to maintain the time.

13 Spare parts

The following list applies to MI-20KW-A and MI-20KWD-A models:

Part code	Description
GC-SAL	Replacement glass cover
CONT-20-SAL	Controller board
CAP-20-SAL	Capacitor board
PS-20-SAL	Power supply board

The following list applies to MI-50KW-A and MI-50KWD-A models:

Part code	Description
GC-SAL	Replacement glass cover
CONT-50-SAL	Controller board (50 000 cd unit)
CAP-50-SAL	Capacitor board (50 000 cd unit)
PS-50-SAL	Power supply board

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

14 Configuration sheets

14.1 Normal operation

DIP	DIP	DIP	Function
1	**2**	**3**	**Light Type** (Note 1)
off	off	off	MI-20KW-A
on	off	off	MI-20KWD-A
off	on	off	MI-20KW-A + OPT-IR-20KW-A
on	on	off	MI-20KWD-A + OPT-IR-20KWD-A
off	off	on	HI-50KW-A
on	off	on	HI-50KWD-A
off	on	on	HI-50KW-A + OPT-IR-50KW-A
on	on	on	HI-50KWD-A + OPT-IR-50KWD-A

4	5		**Flash rate** (Note 2)	
off	off		20 fpm	
on	off		30 fpm	night mode
			40 fpm	day and twilight mode
off	on		40 fpm	
on	on		60 fpm	

6		**Night mode operation** (Note 3)
off		Red and infrared LEDs flashing
on		Red and infrared LEDs in steady-burning mode

7		**Test mode enable**
off		Normal operation
on		Test mode enabled (see Test mode chart for DIP switch settings)

8		**Master/Slave mode**
off		This device is slave
on		This device is master

9		**Reserved**

10		**RS-485 termination**
off		Termination resistor on controller board unconnected.
on		120Ω bus termination resistor on controller board connected to RS-485 bus.

Remarks	
Note 1	Various operating voltages are omitted here for clarity.
Note 2	Customer-specific flash rates available.
Note 3	Applicable to models with suitable hardware and required options installed.

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com

14.2 Test mode

This test mode configuration sheet is valid on these lights while DIP switch #7 (Test mode) is turned on. Test mode is ended when DIP switch #7 is turned off, restoring normal operations.

To enable test mode, while having power on this obstruction light, first turn the DIP switch #7 to ON (i.e. up). Then, turn DIP switches #1 to #5 off (down). Do not turn the power of the light to ON when DIP switch #7 is ON as the light head type would then be missed.

DIP	DIP	DIP	Function
1	**2**	**3**	**Test selector**
off	off	off	Light turned off
on	off	off	Night mode test
off	on	off	Twilight mode test
on	on	off	Day mode test
off	off	on	Photocell test
on	off	on	Communications test
off	on	on	Reserved
on	on	on	Reserved

4	5		Light head test
off	off		All lights turned off
on	off		Turns on white light at approximately 10 % power level
off	on		Turns on red light at approximately full power
on	on		Turns on infrared light at approximately full power

7		Test mode
off		Normal mode
on		Test mode enabled

After leaving test mode (turning DIP switch #7 to off), always restore configuration: configure the light using DIP switches 1-6 and 10 to operate properly.

15 Change log

Version	Date	Created	Changes
1	05-June-2013	RJä	First release
2	13-December-2013	RJä	Tightening torque specified
2.1	19-December-2013	RJä	Spare part list
2.2	14-January-2014	RJä	Corrections in intensity (HI-50KW) New photocell location
2.3	7-April-2014	RJä	Cable gland installation instructions added
2.4	3-June-2014	RJä	changed: 30 fpm mode added: troubleshooting GPS antenna connection

Obelux Oy
Kutomotie 6 B
FI-00380
FINLAND
phone +358 9 6871 6800
fax +358 9 621 5518
http://www.obelux.com
info@obelux.com