LED Lights Interface

Manual - Functions v2.0

LED Lights Digital Interface v1.30

User's manual

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Used electronics disposal

Please observe the local regulations regarding disposal of packing materials, exhausted batteries and old equipment. Used lamps should be returned to the applicable collection point, where they will be accepted free of charge. Proper utilization of equipment enables preserving valuable environmental resources and avoiding adverse impacts on health and the environment, which may be threatened by inappropriate waste handling.

Legal reservation:

However we have done our utmost to make sure that all the parameters of the interface are the actual and correct ones, we do not take responsibility for the correctness of all of them. The parameter of the interface cannot be cause of action against "LEDIKO Walendowski i Wilanowski" Sp. J. or the LEDIKO PRO brand. Please contact us if you have come across any irregularities.

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1. Introduction

1.1. Symbols And Their Meanings

- means tips

- means an example

1.2. General Information

This is a user's manual for the portable digital CLEVEO LED interface and its functionalities.

The Interface enables you to easily read the lamp's parameters or send the desired parameters to the CLEVEO intelligent LED street lamp. The interface must be connected to the lamp only when reading or writing the lamp's parameters.

Picture 1. The external user's interface.

The Interface is available as a separate device connected to the lamp. The Luminaire must be shipped with a connection cord in order to connect the Interface to the lamp.

1.3. Navigating The Menu

Press any key on the keyboard to switch on the interface. The startup screen will be displayed for a short while, after which you will see the first position of the menu - *Options*.

The menu is divided into positions. Each position has its own title and number in the menu.

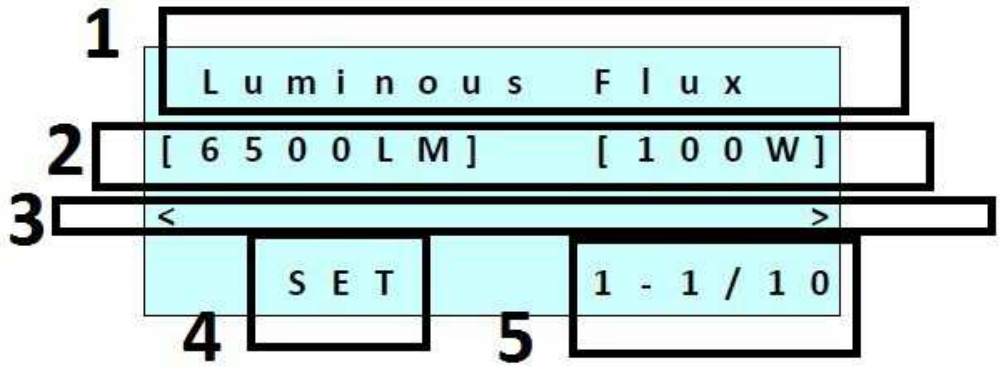
Use the RIGHT ARROW, LEFT ARROW, OK and CANCEL buttons to explore the menu.

By pressing the LEFT ARROW button you can either go back to the previous position in the menu or decrease a parameter's value.

By pressing the RIGHT ARROW button you can either go one position forward in the menu or increase a parameter's value.

By pressing the OK button you can either enter the currently displayed position in the menu or confirm the chosen parameter's value.

By pressing the CANCEL button you can either quit the currently displayed position in the menu or discard the chosen parameter's value.



Picture 2. Segments displayed on the screen.

The segments of the screen are:
1. The menu position title;
2. A parameter's value;
3. The right/left arrows (symbolizing the possibility of navigation);
4. Currently available operation;
5. The current menu position;
The above description of the screen segments will be used in this manual.

1.4. Connecting The Interface to the CLEVEO LED Luminaire

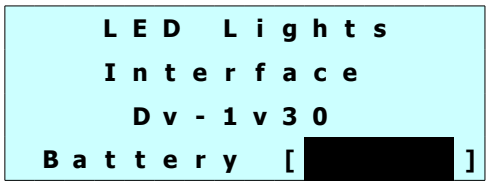
In order to connect the interface to the lamp you must:

1. Switch on the lamp's power supply.
2. Connect the interface to the CLEVEO lamp using the connection cord (shipped with the lamp).
3. Switch on the interface by pressing any key on its keyboard.
4. Read/modify/send the parameters to the lamp using the interface.
5. Disconnect the connection cord, switch off the interface (menu position 4/4).

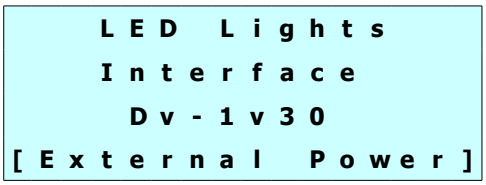
1.5. Supplying the Interface

Sources of energy for the Interface can be: CLEVEO LED Luminaire (version 1v30 of Interface or higher) or the 9V (6F22) battery. Battery is not required if CLEVEO is turned on and Interface is connected. Supply voltage is in safe range between 8V and 12V.

When switching on the Interface not connected to the CLEVEO, the startup screen shows you the current battery level in the bottom line of the screen. When the battery is full, the startup screen looks like the following (Picture 3a).

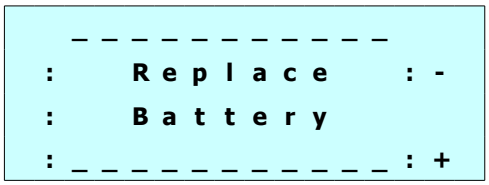


Pic.3a



Pic.3b

If the battery is not full you will see either four, three, two or one rectangle in the bottom line of the screen. If the battery is empty you will see the *Replace Battery* message on the screen. (Picture 4)



Pic.4

If the battery discharges you can replace it. In order to do that you have to remove the battery cover and replace the battery according to the polarization marks on the case.

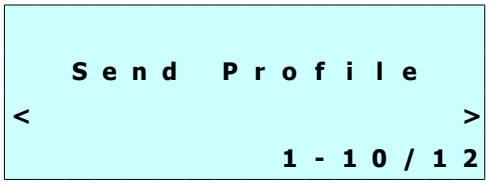
1.6. Programming the CLEVEO LED Luminaire using the Interface

You can program the lamp using the following functions of the interface:

1. SEND PROFILE function - sends a predefined set of parameters (a profile) to the CLEVEO Luminaire.
2. SEND PARAMS function - sends a modified set of parameters to the CLEVEO LED Luminaire.

1.6.1. The SEND PROFILE function

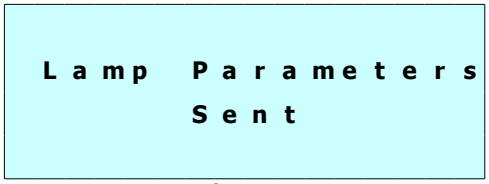
Menu position : 1-10/12



Pic.5

The SEND PROFILE button enables you to program the CLEVEO lamp using all the parameters saved in a profile.

When the SEND PROFILE button is pressed on the keyboard, the Send Profile screen and an SP position displays on the screen. After pressing the OK button, you will see the name of the profile which is about to be sent to the lamp. You can change the name of the profile by pressing the LEFT/RIGHT ARROW. The name of the profile needs to be confirmed by pressing the OK button. The profile will be automatically sent to the CLEVEO lamp and the user will get a Lamp Parameters Sent message. (Picture 6).



Pic.6

The description of the sent parameters and their effect on the lamp's operation are explained in chapters 2.1.1 - 2.1.7 of this manual.

The default profiles settings:
Profiel 1, 2 and 3:

Luminous Flux – 1000 LM

Internal Dim – Disable

Internal Dim Period - 40%

Internal Dim Rate – 50%

External Dim – Disable

External Dim Rate – 50%

Light Up – Disable

Light Up Period - 10%

Light Up Rate – 100%

Aging Compensation – Enable

After the profile has been sent to the lamp, the new settings from the profile are applied immediately.

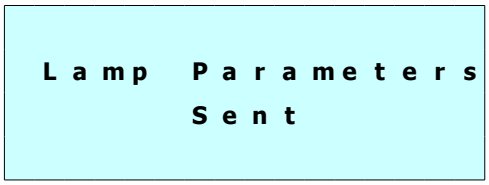
Tips

- The profiles have been designed for quick programming of CLEVEO using predefined parameters.

1.6.2. The SEND PARAMS function

The SEND PARAMS function enables you to program the CLEVEO lamp using all the parameters that are currently set in the Options menu.

When the SEND PARAMS button is pressed, the interface will automatically send the parameters and switch on the functions set in the *Options* menu in the lamp. Once the parameters are sent, the *Lamp Parameters Sent* message will be displayed on the screen (Picture 7):



Pic.7

The description of the sent parameters and their effect on the lamp's operation are explained in chapters 2.1.1 - 2.1.7 of this manual.

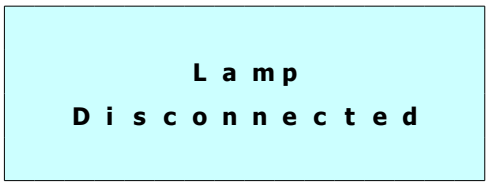
After the parameters have been sent to the lamp, the new settings are applied immediately.

Tips

- You don't need to program the lamp every time you wish to change a parameter. Once you have set all the parameters in the Options menu, you can send them all at once using the SEND PARAMS function.

1.7. Troubleshooting

When, while programming or reading data from the lamp, Lamp Disconnected message appears (Picture 8):



Pic.8

The Lamp Disconnected message means that the lamp can not communicate with the Interface.

In that case please make sure that:

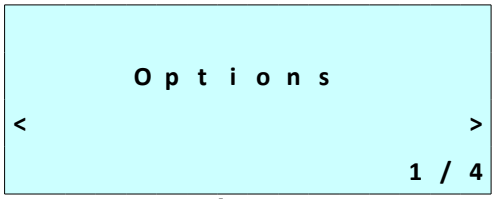
- The CLEVEO lamp is connected to the power supply.
- The CLEVEO lamp is connected to the Interface with the connection cord shipped with the lamp.
- The connection plug is positioned correctly in the Interface's socket.
- The signal wire is not damaged.

In rare cases the communication may come to a halt. When this happens, you must disconnect the connection cord from the Interface, restart the Interface by removing its battery for a short while and restart the CLEVEO lamp by switching its power off for a short while.

2. Functions of the Interface

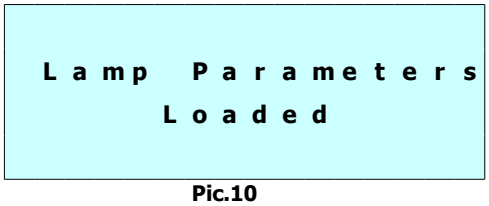
2.1. Options

Menu position: 1/4



Pic.9

By using the Options menu you can either read or modify the current parameters of the lamp. If the lamp is connected to the interface, entering the 1-1/12 - 1-10/12 positions in the Options menu will automatically read the current parameters from the lamp and a Lamp Parameters Loaded message will appear on the screen (Picture 10). If the lamp is not connected to the interface, the default parameters will be set.

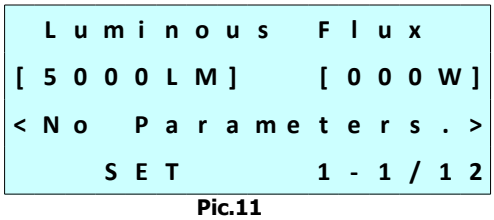


Pic.10

Descriptions of the parameters:

2.1.1. Luminous Flux

Menu position : 1-1/12



Pic.11

The Luminous Flux option enables you to change the lamp's luminous flux and power.

If the Interface is not connected to the CLEVEO, Interface will show No Parameters message. It means that the Interface contains only default values, which can not be changed. To read and change parameters, Interface should be connected to the CLEVEO, and parameters should be downloaded. Parameters will be downloaded automatically when switching on connected Interface, or when switched on Interface is connecting to the CLEVEO (also when: entering Options Menu, entering Statistics Menu, pressing OK button in Statistic Menu, after sending parameters as an acknowledge). Characteristic 'beep' sound means parameters are upgraded in Interface.

The SET message at the bottom line of the screen (picture 11, segment 4) means that the Luminous Flux parameter has been set. Pressing the OK button will change the SET message into a CHANGE message (picture 12, segment 4).

When the CHANGE message is displayed, the Luminous Flux parameter can be modified by pressing the LEFT/RIGHT ARROW. The Luminous Flux value is expressed in Lumens [LM]. Changing the Luminous Flux parameter also changes the lamp's power expressed in Watts [W].

Luminous	Flux
[7200LM]	[120W]
<*7200LM	115W*>
CHANGE	1-1/12

Pic.12

The value modified by the user must be confirmed by pressing the OK button.

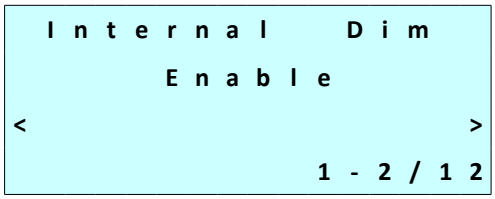
If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

Tips

- Range of parameters are different in different types of CLEVEO LED Luminaires. Luminaires differ from quantity, type and temperature of LEDs. When Interface read parameters from the Luminaire, it also reads type of the Luminaire, and it sets the range of parameters. When Interface is not connected to the Luminaire, all parameters are set to its default, and can be changed only for setting the profile settings.
- The Luminous Flux parameter includes all optical and temperatures losses inside the Luminaire. It means, it does not contain any dirt on the glass. For best results, it is recommended to clean the glass at least one time within two years.
- Second segment of the screen (**[ ]**) shows value of the Luminous Flux set by the User using the Interface and maximum estimated (by the Interface) power in this setting. Third segment of the screen (*** ***) shows the value, that Interface have read from the Luminaire, and estimated (by the Luminaire), actually consumed power. Level of the power consumption has strong relation with temperature.
- CLEVEO LED Luminaire has an algorithm which keeps constant Luminous Flux regardless of outside temperature changings. The LED Driver compensates efficiency losses by increasing or decreasing Luminaires power. Maxmimum Luminous Flux value can be not accesible for outside temperatures over 25 Celsius degree. The lower temperature, the better efficiency of LEDs, lower overall power consumption and longer life time of the CLEVEO LED Luminaire.

2.1.2. Internal Dim

Menu position: 1-2/12



Pic.13

The Internal Dim function enables or disables the internally dimmed mode, if functionality is activated. In other case functionality is LOCKED. To unlock the feature, you have to contact with you CLEVEO distributor.

When in internally dimmed mode, the lamp's Luminous Flux is automatically reduced during the period set in Internal Dim Period parameter. Luminous Flux reduction, decreases the overall power consumption. The desired time after which the lamp's power is to be reduced, is defined by the Internal Dim Period parameter (menu position 1-3/12). The current level of dimming, with respect to the Luminous Flux parameter in the internally dimmed mode is determined by the Internal Dim Rate parameter (menu position 1-4/12). To enable or disable the internally dimmed mode press the OK button. Enabling or disabling the internally dimmed mode is confirmed by the Enable or Disable message on the screen.

If you wish your settings to be saved in the lamp you must program the lamp (chapter 1.6 of this manual).

Example 1 The internally dimmed mode

Exampleowe parametry w oprawie CLEVEO:

Luminous Flux – 6000 lm, 100W;

Internal Dim – Enable;

Internal Dim Period – 40% * Last Nights Average

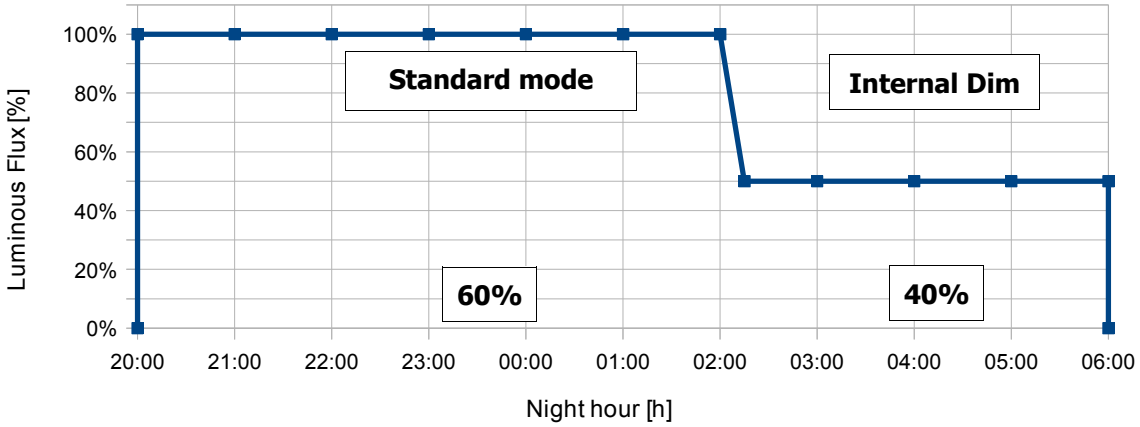
Internal Dim Rate – 50% * Luminous Flux

Last Nights Average – 10h (average from 10 last work cycles, which every is at least 4 hours)

Light Adjustment Time – 5min (dimming time, from 6000LM to needed value)

The lamp starts at the luminous flux of 6000lm and the power of 100W. For the last 4 hours of the lamp's operation (40% of 10h), the luminous flux of the lamp is lowered to 3000lm (50% of 6000lm), giving the 50W power consumption (50% of 100W). You can check the energy savings (%ES) of the internally dimmed mode in comparison to normal mode, by looking at segment 3, in pictures 16 and 17.

Minimum level of Luminous Flux is 10% of its maximum value.
The time profile for the above parameters is illustrated in picture 14:



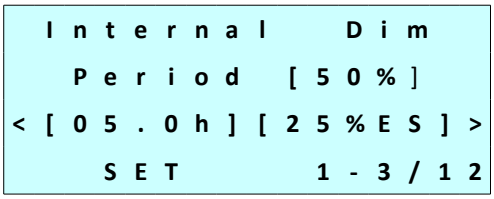
Pic.14 Relation between the lamp's Luminous Flux and operation time.

Tips

- The internally dimmed mode switch-on time is controlled by the microprocessor controller which averages the lamp's operation time from the last ten nights. Default value on the beginning is 10 hours (600min).

2.1.3. Internal Dim Period

Menu position: 1-3/12



Pic.15

The Internal Dim Period option determines the percentage of the lamp's operation time in which lamp works in the internally dimmed mode (Internal Dim 2.1.2).

You can find an example of how to use the Internal Dim option in chapter 2.1.2 of this manual.

The SET message at the bottom line of the screen (picture 15, segment 4) means that the Internal Dim Period parameter has been set. The SET message changes to CHANGE, when the OK button is pressed. When the CHANGE message is displayed, the Internal Dim Period parameter can be modified by pressing the LEFT/RIGHT ARROW. To confirm the desired value press the OK button.

If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

2.1.4. Internal Dim Rate

Menu position: 1-4/12

```
Internal Dim
    Rate [50%]
<[050W] [25%ES]>
    SET      1-4/12
```

Pic.16

The Internal Dim Rate parameter determines the percentage level to which the Luminous Flux parameter is decreased when in internally dimmed mode (Internal Dim 2.1.2.).
Minimum level of Luminous Flux is 10% of its maximum value.

You can find an example of how to use the Internal Dim option in chapter 2.1.2 of this manual.

The SET message at the bottom line of the screen (picture 16, segment 4) means that the Internal Dim Rate parameter has been set. The SET message changes to CHANGE, when the OK button is pressed. When the CHANGE message is displayed, the Internal Dim Rate parameter can be modified by pressing the LEFT/RIGHT ARROW. To confirm the desired value press the OK button.

If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

Tips

- You can check the energy savings (%ES) of the internally dimmed mode operation (menu position 1-2/12) in comparison to normal mode operation (Internal Dim disabled) by entering the 1-4/12 menu position (picture 16, segment 3).

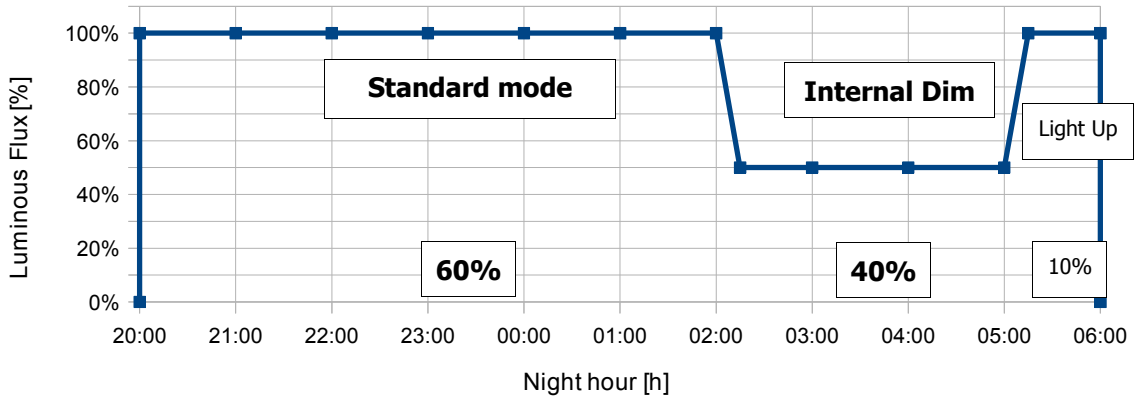
2.1.5. Light Up Mode

Menu position : 1-5/12

```
Light Up Mode
     Enable
<                    >
                1-5/12
```

Pic.17

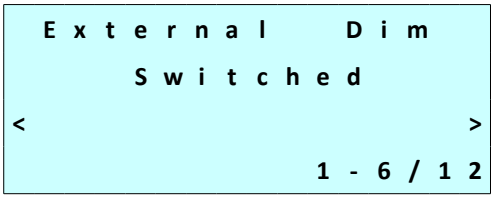
Light Up Mode allows to return from Internal Dim Mode to the level of standard Luminous Flux, for example in early morning hours. Light Up Period is set to the 10% of the average of 10 last work cycles (Last Nights Average) and it is a part of Internal Dim Period, if Light Up Mode is enabled. Light Up Rate is set to the 100% of standard Luminous Flux.
Parameters: Light Up Period and Light Up Rate can be modified only in Admin Menu. Chart below shows one 10-hour lamp work cycle with Internal Dim and Morning Light Up modes enabled:



Pic.18 Relation between the lamp's Luminous Flux and operation time.

2.1.6. External Dim

Menu position : 1-6/12



Pic.19

The External Dim function enables (Switched, Linear) or disables (Disable) the possibility of dimming the lamp with an external signal, if functionality is activated. In other case functionality is LOCKED. To unlock the feature, you have to contact with you CLEVEO distributor.

When in External Dim mode, the CLEVEO lamp's power is reduced to a desired level by an external electrical signal. Power reduction, decreases the lamp's light intensity. The External Dim Rate (menu position 1-6/12) parameter defines the current lamp's power in relation to the power value set by the Luminous Flux parameter. The External Dim mode may be adjusted either in steps (Switched), or continuously (Linear).

The discrete mode

If you wish to use the discrete mode of external dimming, the lamp will accept only the settings set in the menu position 1-1/12 (Luminous Flux) or the light intensity and power set by the External Dim Rate (menu position 1-6/12) parameter, when operating in the External Dim mode.

The continuous mode

If you wish to use the continuous mode of external dimming, the lamp will additionally accept any other desired values. To enter or exit the externally dimmed mode, apply an adjustable electrical signal to the lamp's 0-10V control line.

Example 2 **The discrete externally dimmed mode**

The following parameters have been set in the CLEVEO lamp:
Luminous Flux – 6000 lm, 100W;
External Dim – Switched;
External Dim Rate – 40%.

The CLEVEO lamp goes into externally dimmed mode giving the output of 2400lm and 40W (40% of 6000lm and 40% of 100W) when there is a low logic state on the 0-10V control line (below 5V). Otherwise the luminous flux of the lamp remains at the 6000lm level (over the 5V).

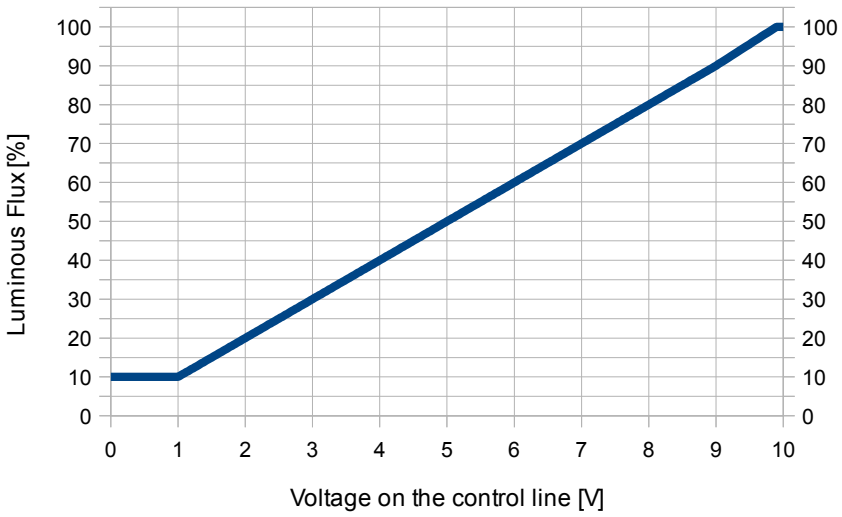
Example 3 **The continuous externally dimmed mode**

The following parameters have been set in the CLEVEO lamp:

Luminous Flux – 6000 lm;
External Dim – Linear.

The lamp goes into externally dimmed mode giving the maximal luminous flux of 6000lm and maximal power of 100W as long as the voltage applied to the 0-10V control line doesn't force the change of these parameters. The current values of luminous flux and power depend on the voltage applied to the 0-10V control line. When the lamp's 0-10V control line is not connected to any external system, the lamp gives the Luminous Flux (100%) and power determined by the Luminous Flux parameter (menu position 1-1/12).

You can find the 0-10V control line driving characteristics in picture 20.



Pic.20 The relation between the voltage on the 0-10V control line and the given Luminous Flux.

To enable or disable the External Dim mode, press the OK button in the parameter's value segment of the screen (picture 3, segment 2). When the OK button is pressed, the Linear/Switched, Disable message will display on the screen, confirming either the enabling or the disabling the External Dim mode.

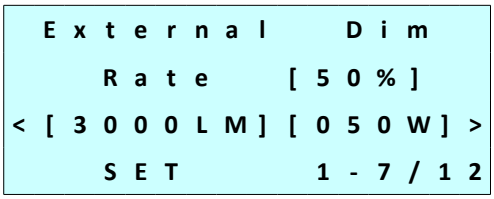
If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

Tips

- The External Dim modes have a higher priority than the Internal Dim mode. This means that switching on External Dim will automatically switch off the Internal Dim modes.

2.1.7. External Dim Rate

Menu position : 1-7/12



Pic.21

The *External Dim Rate* option enables you to set the power reduction level in relation to the *Luminous Flux* (menu position 1-1/12)) parameter. The *External Dim Rate* parameter defines the power reduction level of the discrete mode of external dimming (menu position 1-5/12, *External Dim - Switched*).

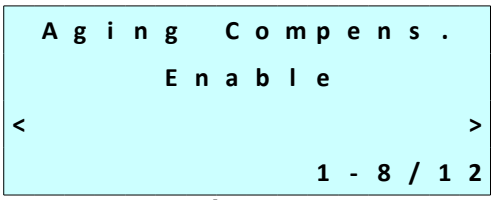
You can find an example of how to use the externally dimmed mode in chapter 2.1.5 of this manual.

The SET message at the bottom line of the screen (picture 19, segment 4) means that the *External Dim Rate* parameter has been set. Pressing the OK button will change the SET message into a CHANGE message. When the CHANGE message is displayed, the *External Dim Rate* parameter can be modified by pressing the LEFT/RIGHT ARROW. To confirm the desired value press the OK button.

If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

2.1.8. Aging Compensation

Menu position : 1-8/12



Pic.22

To enable or disable the aging compensation mode, press the OK button (picture 22, segment 2). Enabling or disabling the aging compensation mode is confirmed by the *Enable* or *Disable* message on the screen.

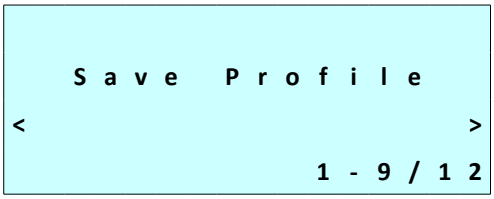
If you wish your settings to be saved in the lamp, you must program the lamp (chapter 1.6 of this manual).

Tips

- The efficiency of light sources decreases in time. The older the light source is, the less light it emits. That is why the traditional street illumination systems are designed for an excessive brightness in the moment of installation, so that as they wear out, they may still comply with the standards for many years.
- CLEVEO has been designed for an exact and constant amount of light throughout its lifetime which in comparison to traditional illumination designing methods, saves energy. The aging compensation function maintains constant luminous flux when enabled (menu position 1-8/12).
- The estimated LEDs' lifetime is the time after which their efficiency decreases by 30%. This parameter can be looked up in the interface's menu position 3-6/8.

2.1.9. Save Profile

Menu position : 1-9/12



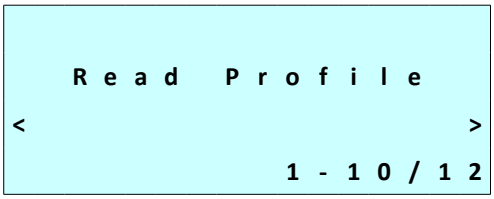
Pic.23

The Save Profile option enables you to save all the parameters set in the Options menu as a profile, so that you can quickly send a set of parameters to the lamp (for more information on how to send a set of parameters to the lamp, please refer to chapter 1.6 of this manual). You can use any of the three profiles - 1, 2 or 3.

To save the parameters set in the Options menu, choose the Save Profile option in the menu position 1-9/12 and press the OK button. The name of the first profile - Profile 1, will be displayed on the screen. You can switch between Profile 1, Profile 2 or Profile 3 profile names, by pressing the LEFT/RIGHT ARROW. To save all the parameters set in the Options menu as a profile, press the OK button once more. Saving the parameters as a profile, doesn't automatically send them to the lamp. In order to send and save the desired parameters in the lamp, you must program the lamp using the Send Profile function (chapter 1.6 of this manual).

2.1.10. Read Profile

Menu position : 1-10/12



Pic.24

The Read Profile option may be used to either read one of the existing profiles, or save a profile's parameters names as the Options menu positions.
To read the parameters from an existing profile, choose the menu position 1-10/12 and press the OK button. The name of the first profile - Profile 1, will be displayed on the screen. You can switch between Profile 1, Profile 2 or Profile 3 profiles' names, by pressing the LEFT/RIGHT ARROW. Pressing the OK button one more time will cause the device to read the parameters from a saved profile. These parameters will be automatically saved under the Options menu positions. Reading the parameters from a profile, doesn't automatically send them to the lamp. In order to send and save the desired parameters in the lamp, you must program the lamp using the Send Profile function (chapter 1.6 of this manual).

2.1.11. Unlock Features

Menu position : 1-11/12

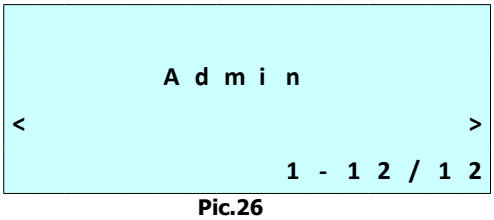
Pic.25

Unlock Features option allows to enter passwords to unlock locked features of the CLEVEO LED Luminaire: Internal Dim Mode (p.m. 1-11-1/3), Light Up Mode (p.m. 1-11-2/3), External Dim (p.m. 1-11-3/3).

To get unlocking passwords you have to contact your CLEVEO Lamp distributor.

2.1.12. Admin

Menu position : 1-12/12



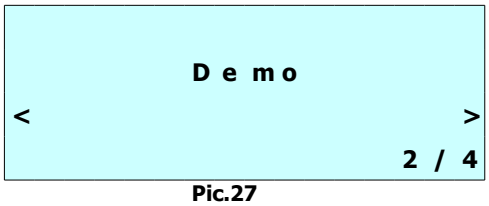
Pic.26

The Admin option allows you to enter the administrator mode. The administrator mode is secured with passwords. Only authorized and qualified personnel can modify the software in the administrator mode, as well as read the servicing data. In the administrator mode you can:

- read and modify the duration of the Softstart of the lamp (SSTime);
- read and modify the dimming speed in the Internal Dim mode (LATime);
- read and modify the dimming speed in the External Dim mode (ESTime);
- read and modify parameters: Light Up Period and Light Up Rate;
- read bin of installed LEDs;
- read the lamp's serial number;
- read the software and driver version;
- read the servicing parameters of the lamp;
- read Last Night Table (which contains time of 10 last work cycles) and Last Nights Average.

2.2. Demo modes

Menu position : 2/4



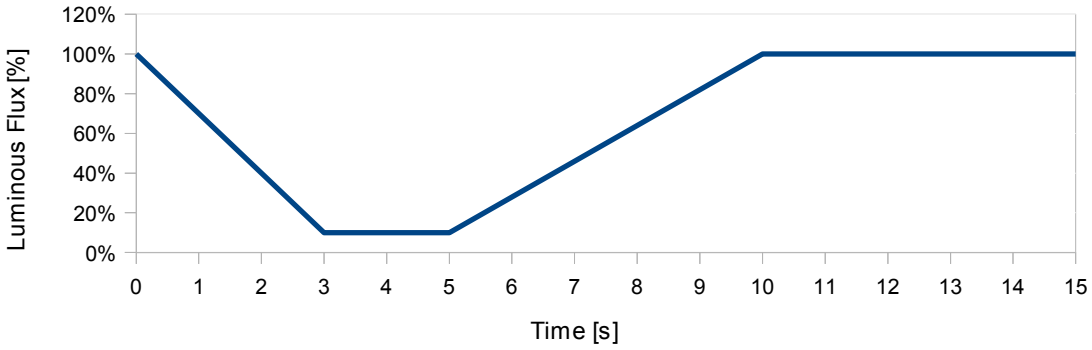
Pic.27

The demo modes have been designed for a quick presentation of the CLEVEO LED Luminaire functions.

You can activate the demonstration modes of the lamp, using the interface. The demo modes present the soft start (*Demo 1 and 2*), dimming of the lamp (*Demo 1*), discrete brightness changing (*Demo 3*) and maximal Luminous Flux (*Demo 4*). To select a demo mode, press the LEFT/RIGHT ARROW. To confirm the selected demo mode, press the OK button. The moment you confirm your choice, the lamp starts the selected demo mode. The current demo mode is interrupted, when another demo mode is selected or during reading/writing parameters to/from the lamp. After a demo mode operation has finished, the lamp carries on with its standard operation (according to the programmed parameters).

2.2.1. Demo #1

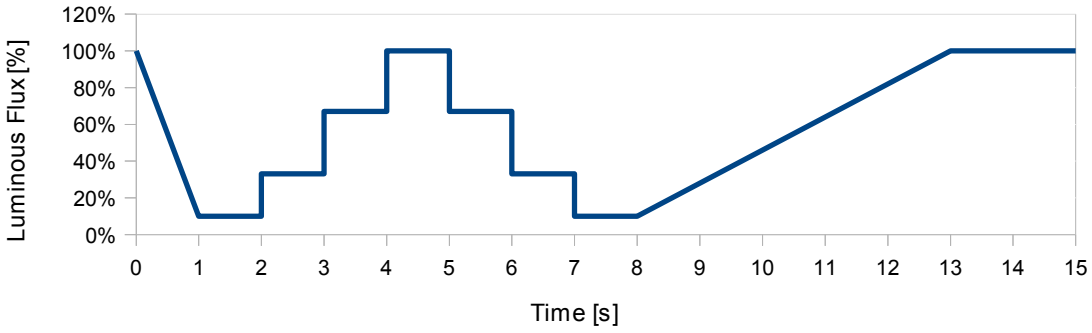
- A short dimming (3s) to 10% of maximum Luminous Flux and wait (2s)
- Softstart (5s)
- 5 seconds of maximum Luminous Flux value
- Back to normal work.



Pic.28 The lighting characteristics of the Demo 1 plan.

2.2.2. Demo #2

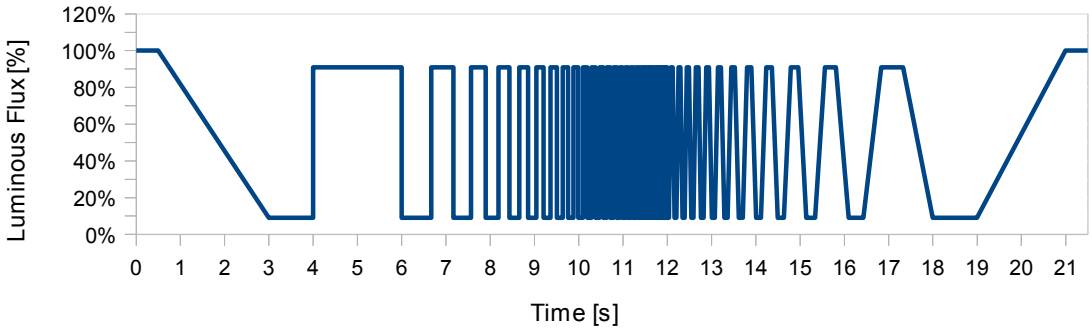
- A short dimming (1s) to the 10% of maximum value
- After 2 seconds, start of changing Luminous Flux in steps, in following order:
- 10% → 33% → 67% → 100% → 67% → 33% → 10%
- After 8 seconds back to normal work.



Pic.29 The lighting characteristics of the Demo 2 plan.

2.2.3. Demo #3

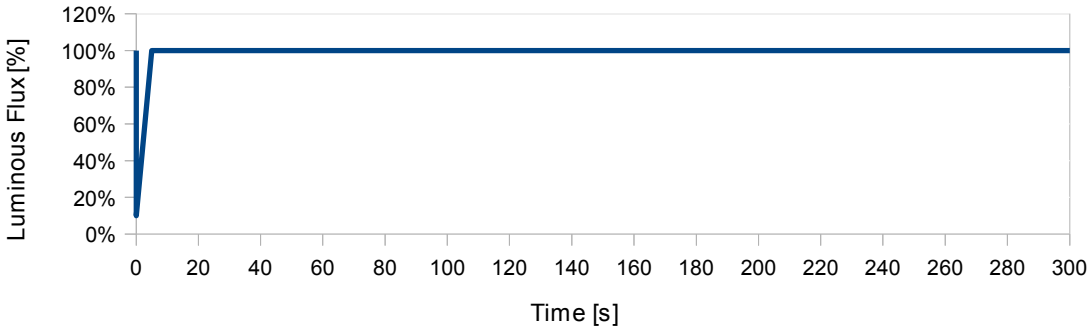
- A short dimming (3s) to the 10% of maximum value
- After 4 seconds start of increasing frequency of changing Luminous Flux from 10% to 90% (sequently)
- After 12 seconds start of decreasing frequency of changing Luminous Flux (smooth)
- Back to normal work.



Pic.30 The lighting characteristics of the Demo 3 plan.

2.2.4. Demo #4

- Switch to 10% of maximum Luminous Flux
- Softstart (5s) to maximal Luminous Flux
- 5 minutes of maximal Luminous Flux operation



Pic.31 The lighting characteristics of the Demo 4 plan.

2.3. Statistics Menu

Menu position : 3/4

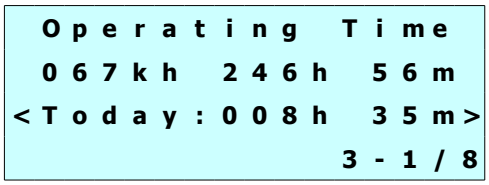
Pic.32

The Statistics option may be used to read the statistical data from the lamp.

To read the statistical data from the lamp press the OK button. The parameters which may be read are:

2.3.1. Operating Time

Menu position : 3-1/8

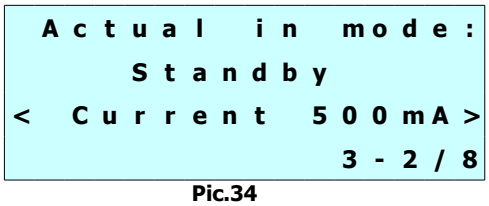


Pic.33

The Operating Time is a total time of the lamp's operation expressed in thousands of hours [kh], hours [h] and minutes [m]. The Operating Time starts once the lamp is switched on, for the first time.
"Today" shows time from beginning of actual work cycle.

2.3.2. Actual Mode

Menu position : 3-2/8



Pic.34

Actual Mode shows actual lamp work mode and actual LED current. Work modes are:

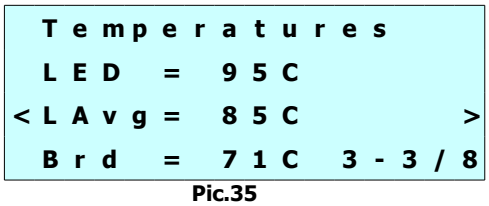
- 'DEMO' – lamp is working in Demo Mode.
- 'Alarm' – temperature of LED chip is near, equal or over critical temperature (105°C) – CLEVEO Lamp decreases Luminous Flux and increases FAN throttle (MRPM).
- 'PostAlarm' – mode after Alarm mode – Luminous Flux is lowered to 90% - 97% of standard Luminous Flux and the FAN throttle is set to 90%MRPM.
- 'ExternalDimSwitched' – Luminous Flux is currently under control of External Dim Switched feature, and it is lowered to the level described by External Dim Rate parameter. That means that level of voltage on control line (1-10V) is between 1V and 5V.
- 'ExternalDimLinear' – Luminous Flux currently depending on level of voltage on the control line (0-10V, Picture 20);
- 'In-InternalDim' – lamp is in Internal Dim Mode.
- 'Standby' – standard work mode – lamp is waiting for Internal Dim Mode or External Dim Switched.
- 'AfterLightUp' – standard work mode after return from Internal Dim Mode. The return is available when Light Up Mode is enabled.
- 'LFluxChanging' – Luminous Flux is fluently changing. It depends on parameters that can be modified in Admin Menu: Light Adjustment Time and External Switch Time. Light Adjustment Time is connected with Internal Dim Mode (Picture 14.) and Light Up Mode (Picture 18.), and External Switch Time is connected with External Dim Switched mode.
- 'LampIsOFF' – lampa is turned off by one of the following reasons (only for Solar Luminaires):
  - decrease of Luminous Flux to its minimal value (1000LM) did not eliminate critical temperature of LED diodes (105°C), so the lamp is turned off, to avoid any damage. There is a probability, that value of ambient temperature is over allowable value.
  - External Dim Switched mode is active with External Dim Rate parameter set to 0% of Luminous Flux, and voltage on the control line (1-10V) is lower than 5V.
  - External Dim Linear mode is active, and voltage on the control line (1-10V) is lower than 1V.
- 'NotConnected' – CLEVEO LED Lamp is not connected to the interface.

Tips

- When lamp is in 'Alarm' or 'PostAlarm' mode, that means that ambient temperature is over allowable value, or the power of the CLEVEO Lamp too high. It is recommended to lower the power of the lamp, or make sure, that the ambient conditions will damage the lamp.
- The higher temperature of LED diode, the faster aging of the diode will effect, and the efficiency of LED diode will decrease. Temperature of LED diode is showed in Temperatures menu (m.p. 3-3/8).

2.3.3. Temperatures

Menu position : 3-3/8

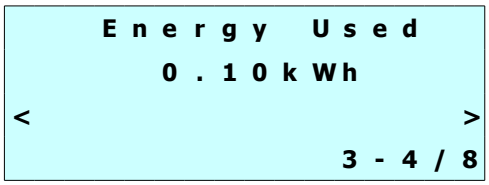


Pic.35

LED is a present temperature of LED chip, LAvg is average temperature of LED chip, Brd is a present temperature of the LED module. Values on the picture are examples in 25°C ambient temperature in room.

2.3.4. Energy Used

Menu position : 3-4/8

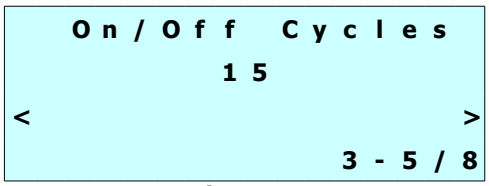


Pic.36

The Energy Used is an estimated value of the total energy used by the lamp expressed in kilowatt-hours [kWh]. The Energy Used measurement starts once the lamp is switched on, for the first time.

2.3.5. On/Off Cycles

Menu position : 3-5/8

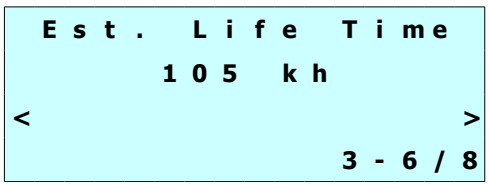


Pic.37

The On/Off Cycles presents the information on the number of times the lamp has been switched on/off.

2.3.6. Est. Life Time

Menu position : 3-6/8



Pic.38

The Estimated Life Time is the estimated lifetime of the LEDs (L70). The L70 LEDs' lifetime is the time after which the LEDs loose 30% of their original efficiency.

Tips

- The efficiency loss of the LEDs may be compensated by the CLEVEO lamp. Please refer to chapter 2.1.8 of this manual for more detailed information on aging compensation.
- The Est. Life Time parameter is based on the operational conditions of the LEDs, as well as the aging characteristics provided by the their manufacturer.
- A standard lifetime of the LEDs mounted in CLEVEO is greater than 60 thousand hours.

2.3.7. Last Nights Average

Menu position : 3-7/8

```
LastNightAverage
      600 min.
<                >
                 3-7/8
```

Pic.39

Last Nights Average is an average time of 10 last work cycles (10 last nights). Work cycles below 240 minutes (4 hours) are ignored. Default value, which is present before first cycle, is set to 600 minutes (10 hours).

2.3.8. FAN Status

Menu position : 3-8/8

```
 FAN is ON  [40%]
 40%:  065h  57m
<90%:   01m  23s >
                 3-8/8
```

Pic.40

FAN Status menu shows actual FAN mode and time of FAN work cycles. Value in percent refers to the maximum revolution per minute (MRPM).

Example values on Picture 40 shows, that the FAN is in 40%MRPM mode, whole time in 40%MRPM mode is 65 hours and 57 minutes, and in 90%MRPM is 1 minute and 23 seconds.

Tips

- Turning 90%MRPM mode is available only when lamp is in 'Alarm' mode (when LED diode temperature reaches critical temperature 105°C).
- When counter of 40%MRPM time reaches its maximum (999 hours 59 minutes), place of hours is replaced by thousands of hours (kh), and place of minutes is replaced by hours (h).
- When counter of 90%MRPM time reaches its maximum (59 minutes 59 seconds), place of minutes is replaced by hours (h), and place of seconds is replaced by minutes (m).

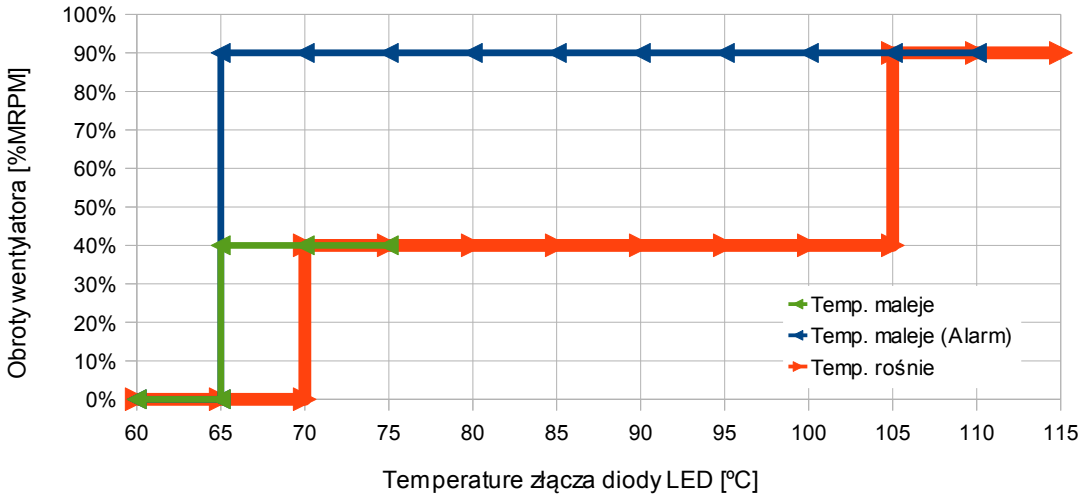
An example hysteresis of FAN work cycles showed on Picture 41 has following, chronological progress:

a) Temperature of the LED chip is increasing, but is lower than 70°C – FAN is off.

b) Temperature of the LED chip exceeds 70°C – FAN is in 40%MRPM mode. Then:

- Temperature of LED chip stops increasing on 75°C and starts decreasing – FAN is in 40%MRPM mode to the moment, when temperature of the LED chip falls down to 65°C – FAN turns off. Return to point a).
- Temperature of the LED chip still is increasing and exceed critical temperature105°C – FAN goes to the 90%MRPM mode. Then:
  - Temperature of the LED chip stops increasing on 110°C and starts decreasing – FAN is in 90%MRPM mode to the moment, when temperature of the LED chip falls down to 65°C – FAN turns off. Return to point a).

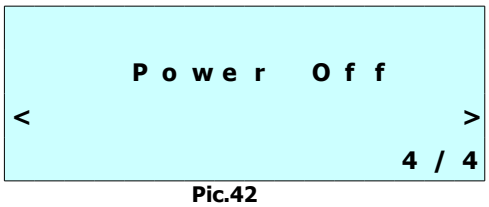
a) Temperature of the LED chip still is increasing over critical temperature 105°C – FAN is in 90%MRPM mode to the moment, when lamp is turned off by overheat protection in 'Alarm' mode (all modes are listed in point 2.3.2 of this document).



Pic.41 Chart presenting hysteresis of FAN work cycles.

2.4. Switching The Interface Off (Power Off)

Menu position : 4/4



Pic.42

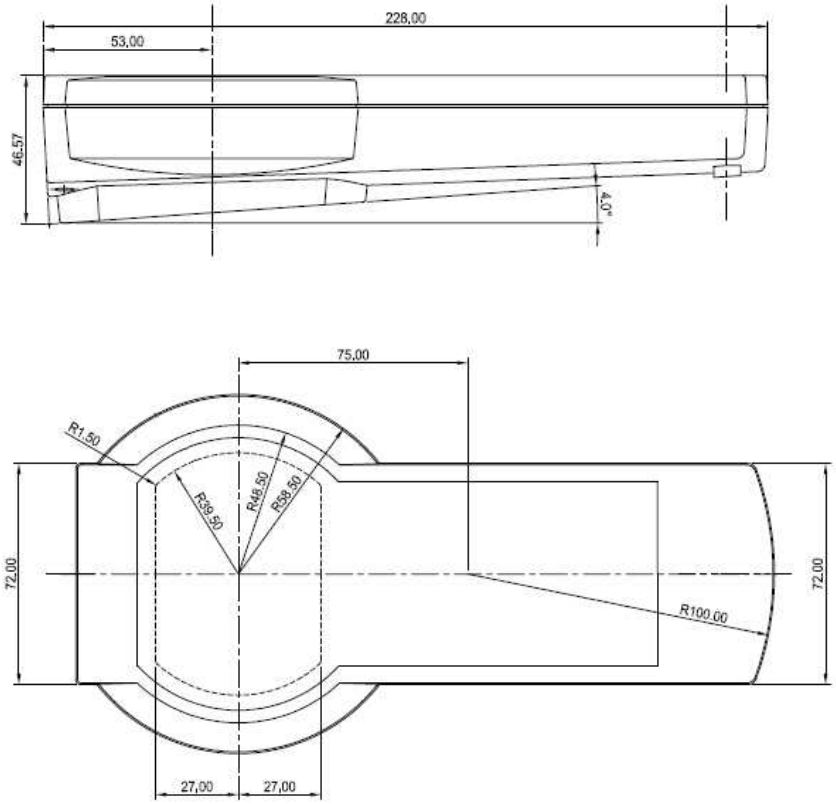
The Power Off function switches the interface off.

To switch off the interface, press the OK button in the 4/4 menu position.

Tips

- If the connected Interface is not used for longer than 5 minutes, it blinks and beeps twice with a communicate.
- If the unconnected Interface is not used for longer than 5 minutes, it switches off automatically to save to battery.
- To switch on the Interface press any key on the interface's keyboard.

3. The Drawing Of The Interface



Pic.43

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