SEARCHLIGHT SYSTEM BY COLORLIGHT

INSTALLATION & USER'S MANUAL

ENG

Revision nr: F1.11
Revision date: 2016-05-13

Safety reminder

Remember to break all electrical power to system before starting any work in the electrical box or the searchlight unit.

All information in this manual was correct at time of publication. However, as our engineers are always updating and improving our products, your system's software might provide a slightly different appearance or modified functionality than presented in this manual.

If your system lacks any function presented in this manual, there is possibly a software update available to resolve this, please contact Colorlight for more information.

CONTENT

Approvals		
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1. WARNINGS AND INFORMATION

CAUTION!
Before servicing any part of the searchlight system, make sure all power is switched off!

Cleaning
Never wash the searchlight with water under high pressure because this can penetrate through the seals and cause damage to mechanical and electrical components.
Do not use strong solvents such as thinner or acetone to clean the searchlight body or the operator panel.

Deicing
Removal of ice should be done with caution. Physical violence can damage the LED-lamp modules or the searchlight driving mechanics.

LED-modules developed by LUMINELL AS

The LED-modules we use are developed by Luminell AS in Norway for Colorlight.

The CLITE LED-housing has a sealed, solid and compact construction with powerful light distribution and excellent thermal design.

The high quality CLITE Led module is designed and manufactured in Scandinavia.

luminell®
simply bright

For more information, please visit:
www.luminell.com/

2. WARRANTY CONDITIONS CLITE2

A correctly installed searchlight system from Colorlight requires no planned regular maintenance or service during the first 10 years in operation.

The “Maintenance and Service plan” describes how to keep the product in good condition.

The warranty is conditioned by below mentioned key points.

Before powering up the unit, make sure that:

- ☐ Vibration dampers are mounted correctly according to this installation manual.
- ☐ The mechanical fundament where the searchlight is placed is robust.
- ☐ Warranty seal on the service hatch is unbroken.
- ☐ Outgoing cable radius from the searchlight is smooth and not stressed.
- ☐ All cables used for the installations are as per Colorlight’s specifications or as per separate made agreement.
- ☐ Signal cables are not placed together with high power cables.
- ☐ Electrical connections are made according to electrical scheme and wiring diagram.
- ☐ Length of cables are not exceeding the recommended maximum lengths as stated below:
  - Power/signal cables between searchlight and E-box for 100-240VAC-system: Max 30 meter
  - Power cables between searchlight and E-box for 24 VDC-system: Max 7 meter
  - Remote cable / Ethernet cable between E-box and remote control: Max 100 meter (longer distance requires an amplifier or fibre optic version).
- ☐ E-box (EB) is placed in an non-condense environment with a minimum temperature of +5 C (indoor) if not customised for other installation.
- ☐ The remote panel (OP) is bridge mounted in an IP56 environment. If placed outside it must be under a protection hood when not in use.
- ☐ Remote panel is screwed in bridge panel, properly grounded and correct installed.

After above checkpoints are verified the system should be started up as per this manual to verify the functionalities.

In case of any questions related to the warranty, please contact us at info@colorlight.com for additional support.

3. MAINTENANCE AND SERVICE PLAN

Although the system does not require regular maintenance to function, we recommend, however, that this preventive maintenance plan is followed in order to keep the searchlight in good condition and in time detect if something is wrong and needs to be corrected.

Recommended inspection on a weekly basis

1. Make visual inspection of the searchlight housing and cabling. Look for any potential mechanical damage caused by external force. A damage can lead to reduced or non-functionality.

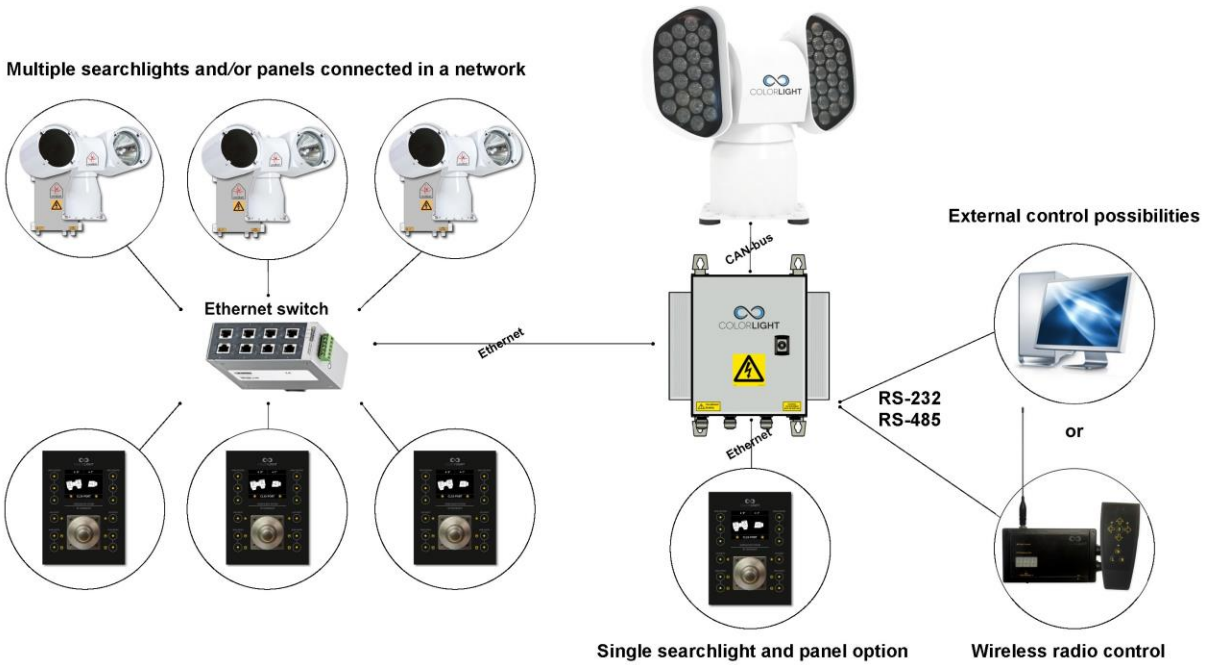
2. Make a visual inspection of the searchlight glasses. Verify that they are without any crack or broken in any way. A crack can lead to water penetration inside the housing followed by potential electrical and mechanical problem.

3. Perform a function test. Start up the searchlight system, rotate the searchlight in horizontal and vertical direction.

4. Clean the searchlight. Rinse with fresh water to wash away the salt deposits. If more dirty, use a very soft sponge and soap that is not caustic, contains strong solvents such as acetone or thinner base. The house can be both polished and waxed for a shiny and durable surface, but the glass should under no circumstances be waxed. Under no circumstances can the searchlights be washed with high pressure water as this can lead to penetration inside the housing followed by potential electrical and/or mechanical problem.

5. Deicing. Winter time the system should be deiced with caution. First turn the lights on to let the heat melt the ice before operating the system horizontally and vertically.

4. COLORLIGHT SEARCHLIGHT SYSTEM



Colorlight has with its newly developed control system for searchlights opened for a flexible and future-proof system in which several searchlight assemblies (CLITE2, CLED, CL20, CL25 and CL35/38) and operator panels can be connected to a dedicated network and communicate via the Ethernet infrastructure.
Control-computers and navigation equipment are other examples of devices that can be part of this network.
For external communication between the electrical box and its various controllers we use the TCP / IP protocol through the Ethernet infrastructure.
For internal communication between the box and searchlight we have chosen to work with CAN bus technology. CAN (Controller Area Network) is a network standard originally developed for the automotive industry and with only two wires it's possible to transmit a variety of control data and information.

The searchlights drive motors (horizontal and vertical) are of the type brushless servo motors, with excellent performance, long lifetime and high reliability.
The motor drivers are located inside the searchlight and are of an "intelligent" type, which constantly analyzes the motor condition, and if problems arise, such as tripped over current protection; this will be presented as an alarm in the operator panel.

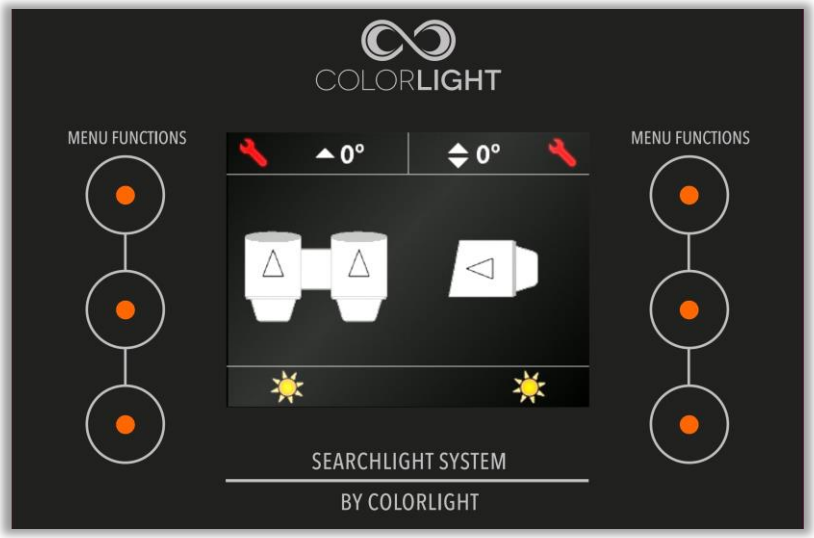
5. OPERATOR PANEL, OVERVIEW

1. **"Soft button":** the function appears in the display window next to the button.
2. **Left lamp on/off**, (if “Single lamp mode” **= On** ***[1]**).
3. **Left light increase intensity** (Dim **up** in steps ***[2]**).
4. **Left light decrease intensity** (Dim **down** in steps ***[2]**).
5. **Right lamp on/off**, (if “Single lamp mode” **= On** ***[1]**).
6. **Right light increase intensity** (Dim **up** in steps ***[2]**).
7. **Right light decrease intensity** (Dim **down** is steps ***[2]**).
8. **Joystick** (”Hall effect” proportional).
9. **Display** (TFT 2,4”).

*[1] See 15.8.5.5 Single lamp mode .
*[2] LED dim levels are 25%, 50% 75% of max intensity. When light is lit the **Intensity always starts at 100**% (max) regardless of previous dim level.

Note: Several sections of the manual refer to the above figures

6. DISPLAY SYMBOLS AND MESSAGES



Symbol for switched off white light.

Symbol for switched on white light.

Symbol for any electro-mechanic error. Might be referred as an over voltage or over current for motor drivers. Communication error with motor drivers will result in the same symbol. This error symbol can be reset by simply enter the main menu and select status. Then press "**dismiss**". If over current have occurred the problem might be referred as a stucked lamp housing – check for any icing issues. Each axis has its own symbol showing in upper left or right corner of the display.

This symbol and a similar symbol indicate the direction of the lamp housing both for the vertical axis and for the horizontal axis. The arrows in the shown symbol indicate the elevation angle for the vertical axis according to the horizontal-plane.

For the horizontal symbol and axis these small arrows indicate if the housing is directed to the left, front, right or back of the centerline.

If the arrows are replaced by question marks then the system needs to be internally calibrated. The easiest way to do the internal calibration is by simply choose the "**Park**" in the quick start menu, please see 14.6 Off and park.

6.1 **Ebox alarm relay**

The searchlights electrical and mechanical condition are constantly monitored and if there is a malfunction in the system this is indicated by icons in the panel display with clarifying warning messages found in the panels status menu.
The control box also has a relay output that can be connected to the boat monitoring system; see the wiring diagram for connection details.

The following errors trigger the alarm output.

Message	Fault
Communication error	Transmission issues on the CAN bus
Over current	Overcurrent protection triggered, movement blocked
Over voltage	Overvoltage protection triggered, voltage to searchlight motordriver/s have exceeded its maximum value.
Under voltage	Undervoltage protection triggered, voltage to searchlight motordriver/s has fallen below its minimum value.
OPWDT (message in box only)	Ethernet communication broken to all panels, see *(4.1) OP WDT.* Fault auto-resets if contact is restored with at least one panel

7. INSTALLATION

7.1 Lifting the searchlight

CLITE2 Standard

Preferable lift the searchlight by the temporary lift loop on top of the center house. After safely fixed the searchlight, remove the lift loop.

During the lift, the searchlight cables must be secured to the hook to avoid straining and damage on the cable glands.

CLITE2 IR (camera house)

The picture on the right shows how to place the lifting slings when there is no lift loop available.

Also in this case the searchlight cables must be secured to the hook to avoid straining and damage on the cable glands.

8. CLI-30001, ANTI VIBRATION KIT

Service instruction no: **CLI-30001**
Revision date: **2016-02-10**
Applicable models: **CLITE2, CL20-11, CL25-**, CL35/38-****

Spareparts needed (refer to CL spareparts list)

1	CLS-25130 Anti vibration-kit × 1 (included in delivery)
2	

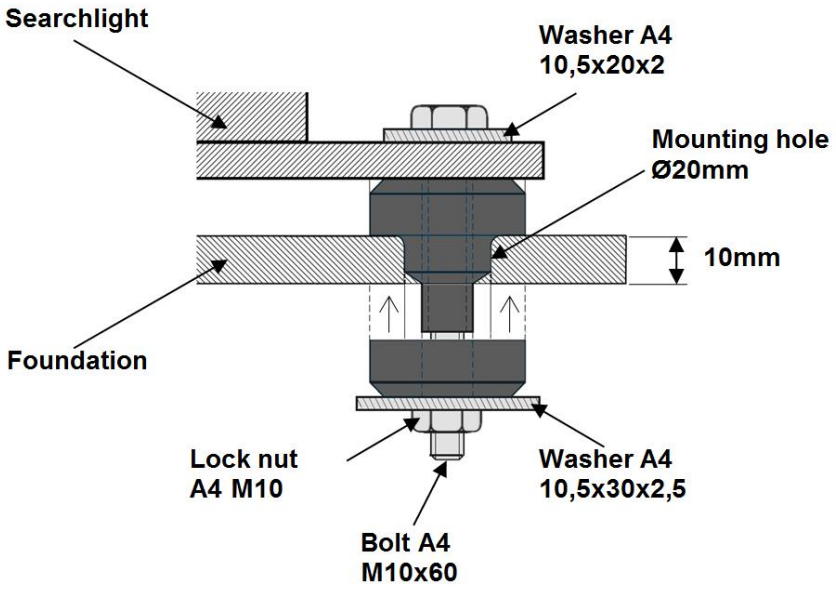
Tools and supplies required:

1	17mm ratchet wrench × 1
2	17mm wrench × 1
3	
4	

Important information

This instruction shows how to install the anti-vibration kit which consists of four dampers with integrated stainless steel tubes.
The dampers main function is to absorb the harmful vibrations that can damage the mechanics and shorten the life of the bulbs (CL20, CL25 CL35/38). Searchlight installations without dampers will uncompromisingly, void the warranty.

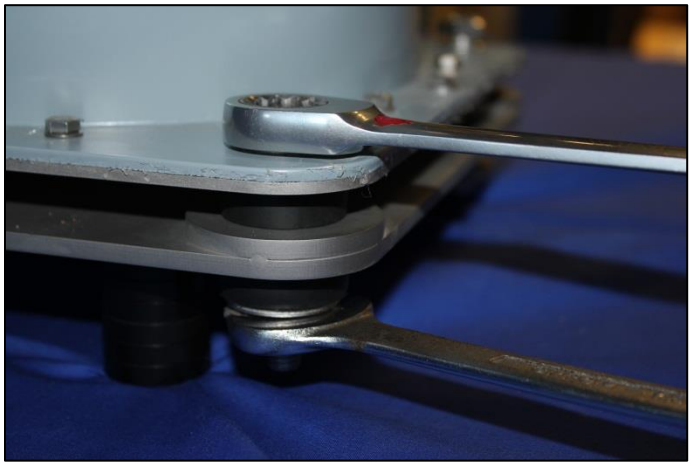
Figure 1



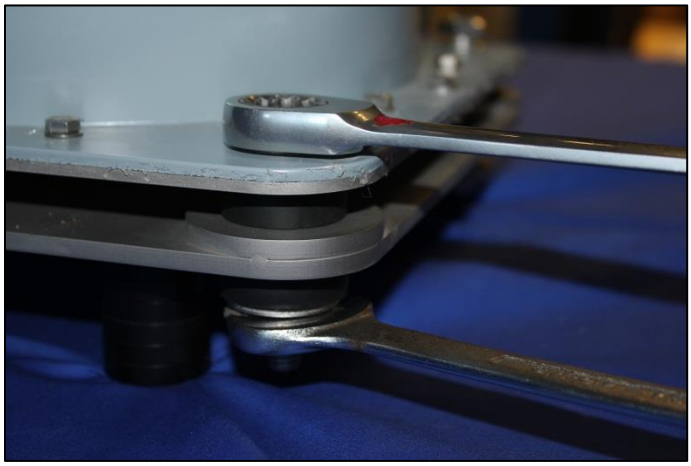
1. Overview of the damper assembly and its parts.

2. Push the dampers tube part thru the mounting holes in the foundation.

3. Mount the dampers rubber part from other side of the foundation.



4. Lower the searchlight on top of dampers and mount bolt washers and nuts as shown in figure 1.



5. The lock nut is tightened with two wrenches size 17mm, tighten nut firmly.
   The dampers rubber part will be compressed slightly, after assembly the searchlight will be rigidly secured but still resistant to vibrations.

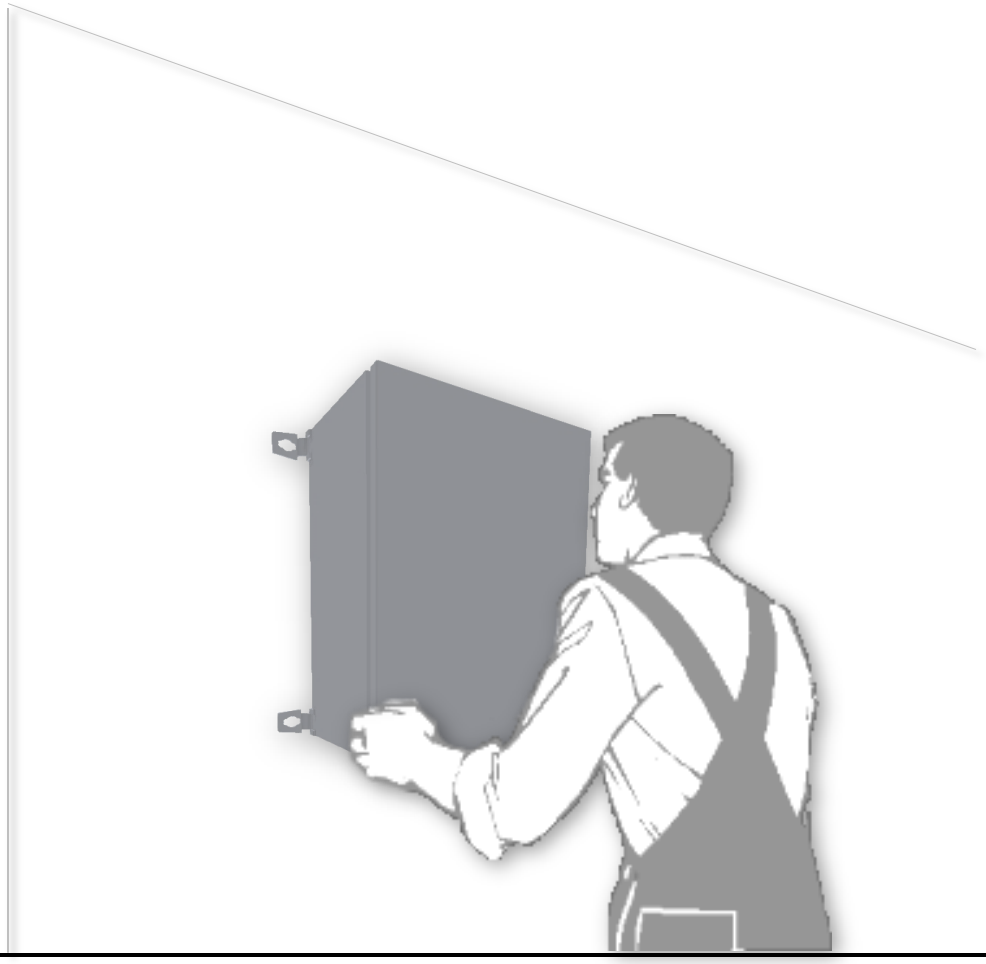
9. ELECTRICAL SYSTEM

IMPORTANT!

The electric supply to the e-box must be disconnected before beginning any work inside the box; <u>it's not enough to turn off the internal main switch.</u>

9.1 Electrical box mounting position

The electrical control box must be mounted on a wall as shown below, do not mount horizontally on the floor or in ceiling as this leads to reduced airflow with increased risk of overheated components.



9.2 Electrical box installation

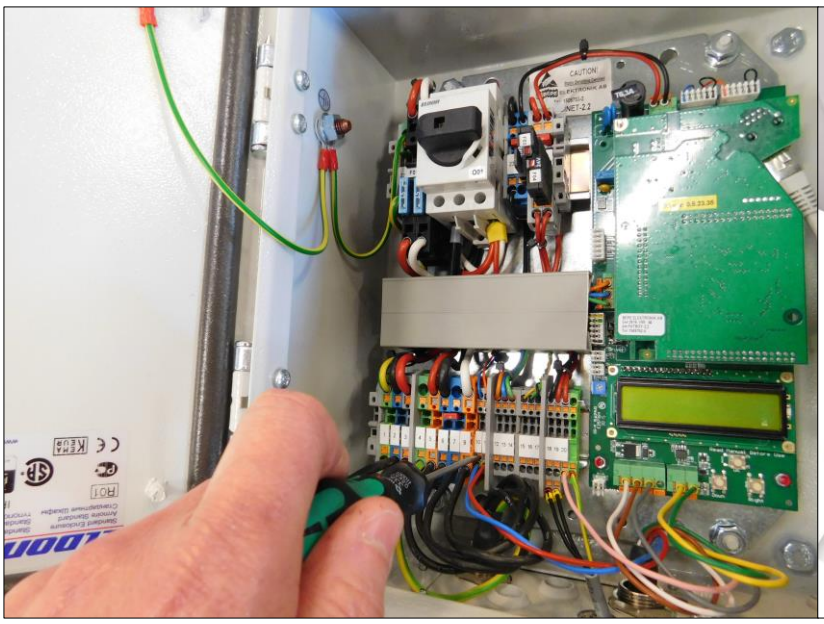
Tools and supplies required:

1	Screwdriver 0,6×3,5 mm
2	Adjustable wrench type Bacho 8071
3	Wrench 13 mm
4	

Important information

The complete system is undergoing final testing before delivery and therefore has the searchlight cables installed in box.

1. Ensure that the switch Q01in box is set to off.
2. Remove all the cables in the terminals, the terminals are push-in type and the wire is released easily by pressing the orange button with a screwdriver while pulling lightly in the wire.
3. Loosen the cable glands with an adjustable wrench and pull out the cables.
4. Mount the electric box on a firm foundation with the help of the wall brackets.
5. Install in reverse order and pay special attention so that the cables shields are mounted correct in the cable glands, see figure 2 below for guidance.
   Cables are connected according to the wiring diagram and double-checked before the power is turned on using the main switch Q01 in the electric box.

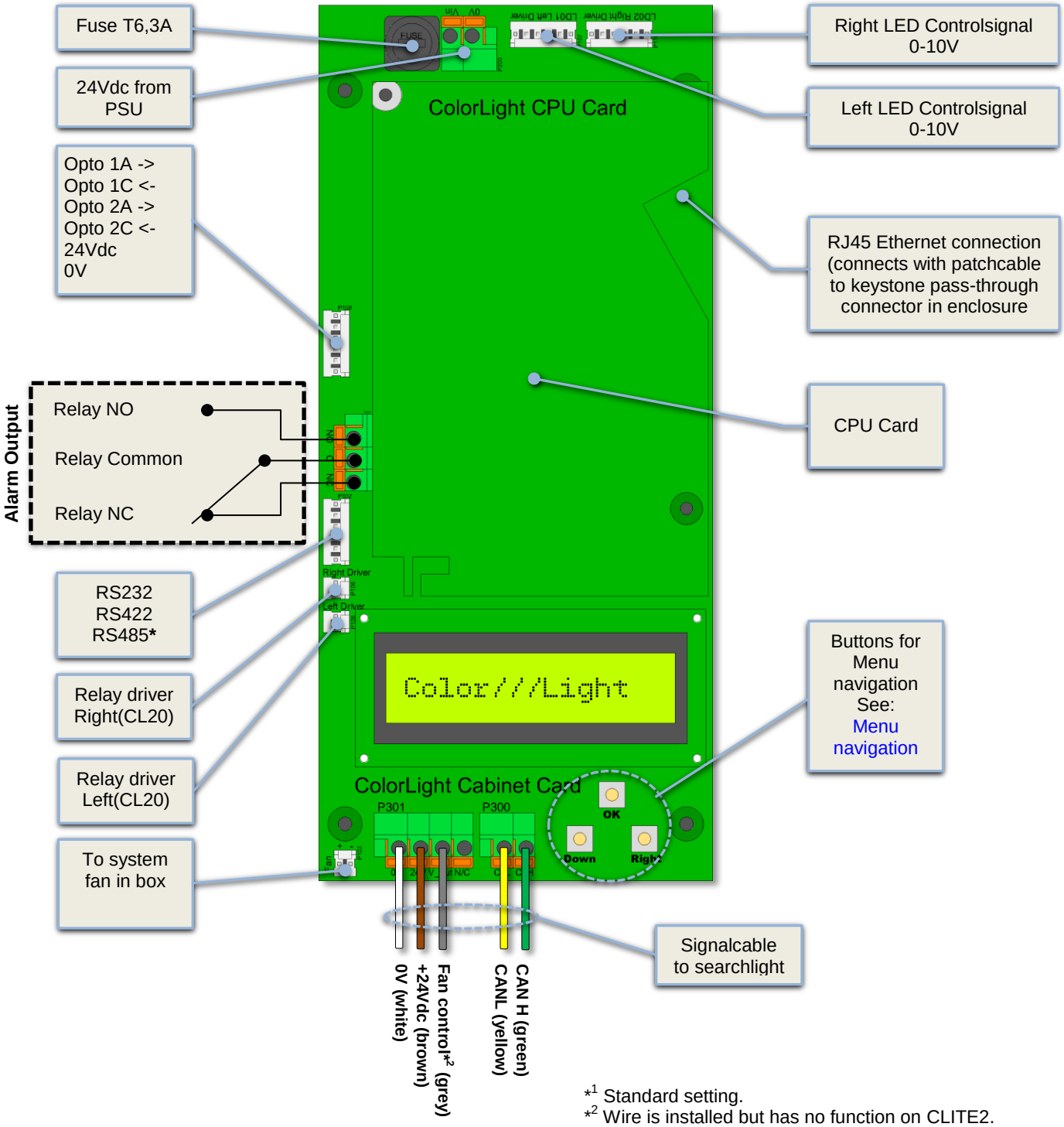


CLITE2 Electrical Box (24Vdc)

EMC Gland Shield Connection

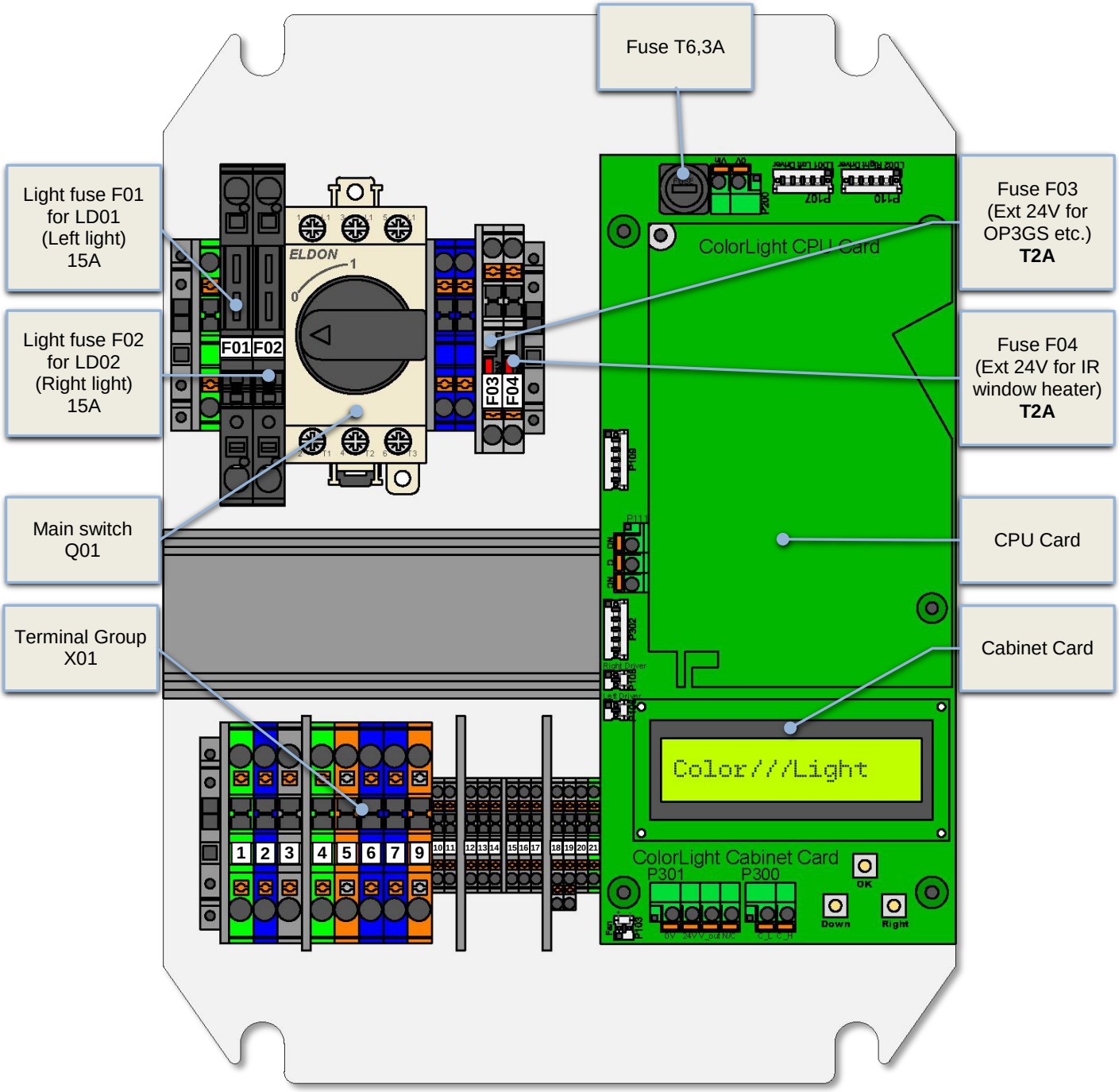
9.3 Cabinet card

Colorlights control system is stable and future-proof and the cabinet card is equipped with a number of inputs and outputs as to allow the communication with the searchlight but also communicate with computers, radio receivers, limit switches (via optocoupler) etc.
On the output side, we have relay controlled alarm output (NO, NC) for external alarm handling and outputs for controlling relays (via optocoupler).



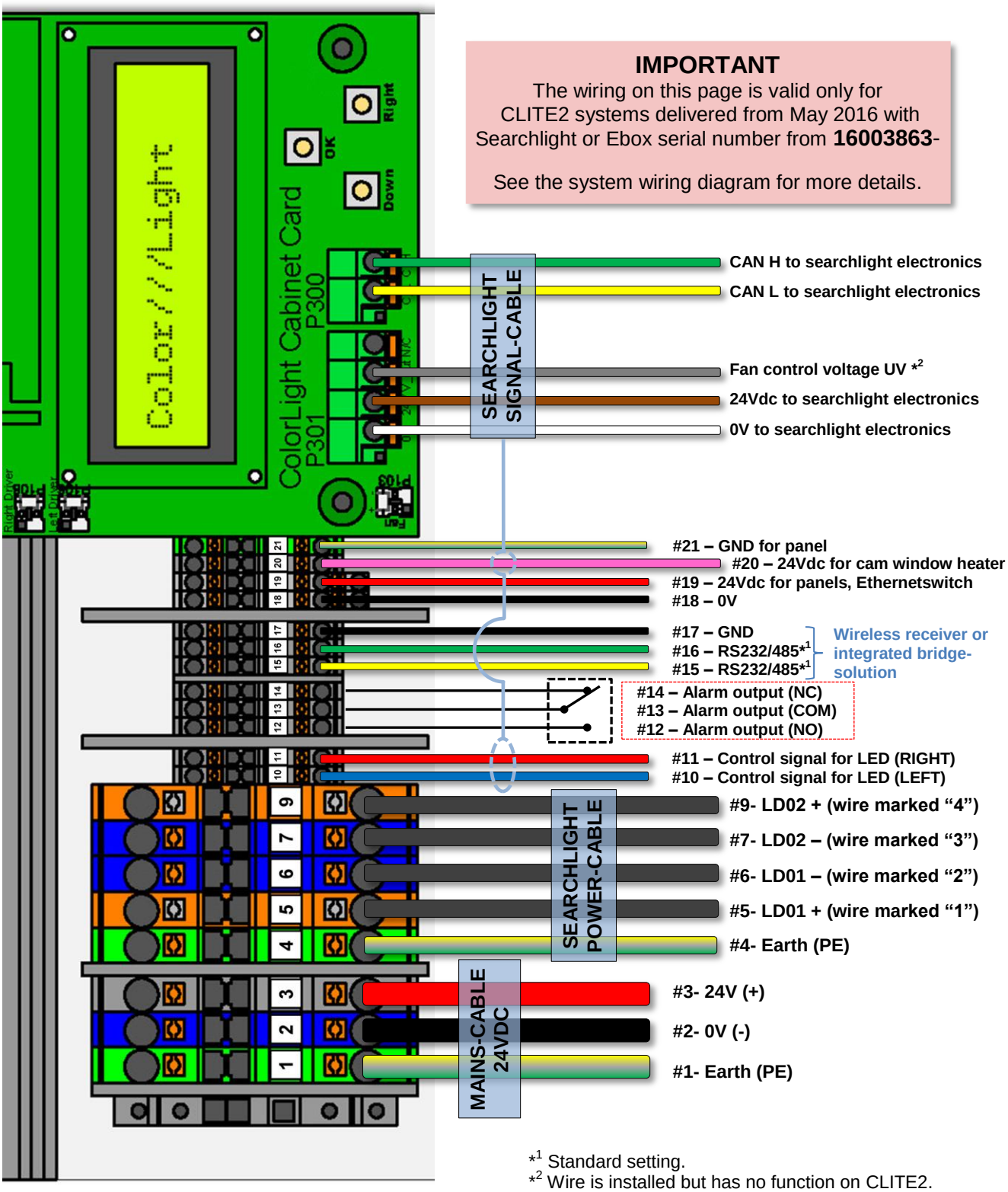
*1 Standard setting.
*2 Wire is installed but has no function on CLITE2.

9.4 CLITE2 electrical-box overview (24VDC)



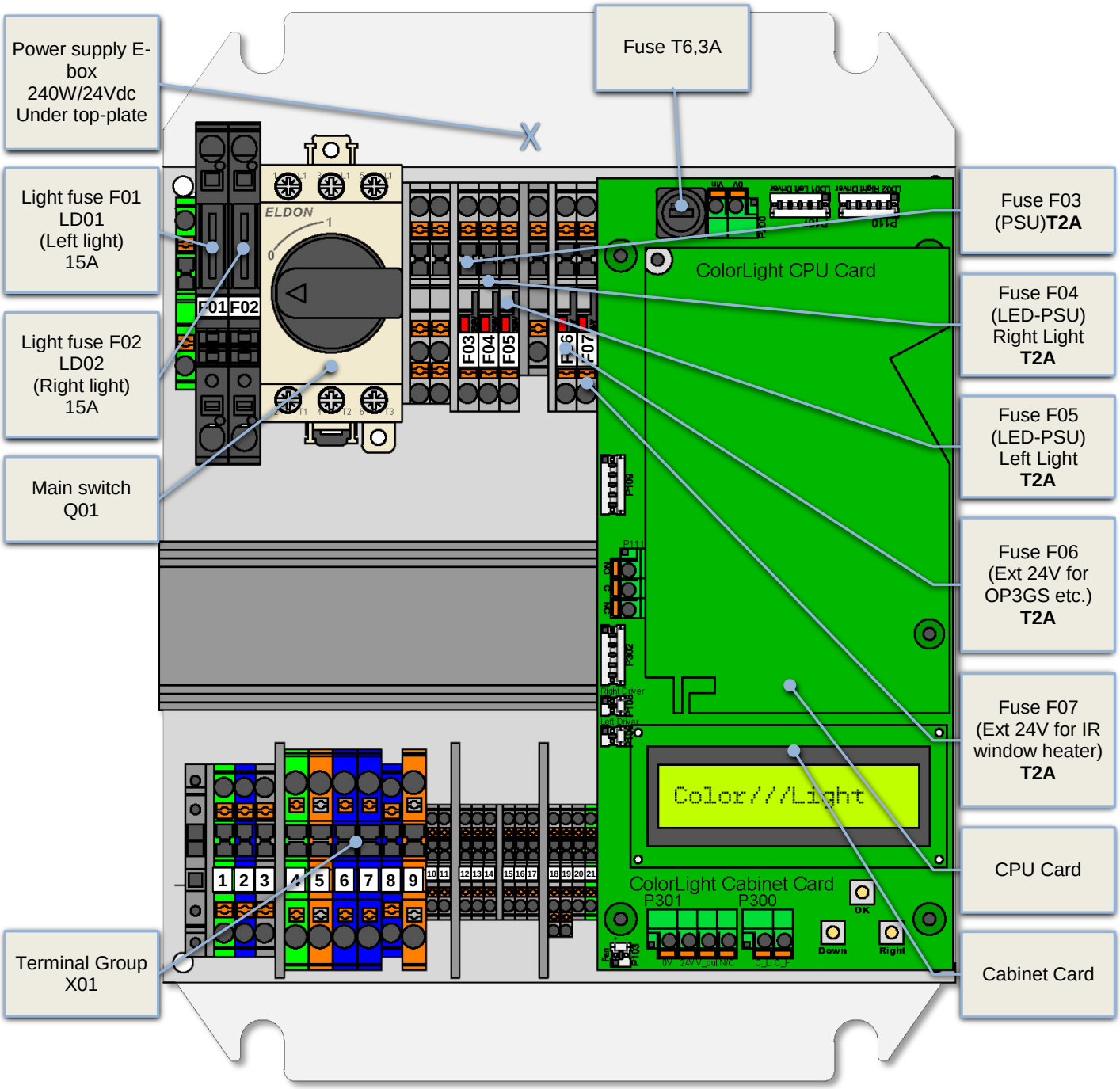
9.4.1 CLITE2 electrical-box connection (24VDC)

This connection diagram shows our standard connection for CLITE2 with electrical box supplied with **DC voltage**. Deviations may occur for customized solutions.



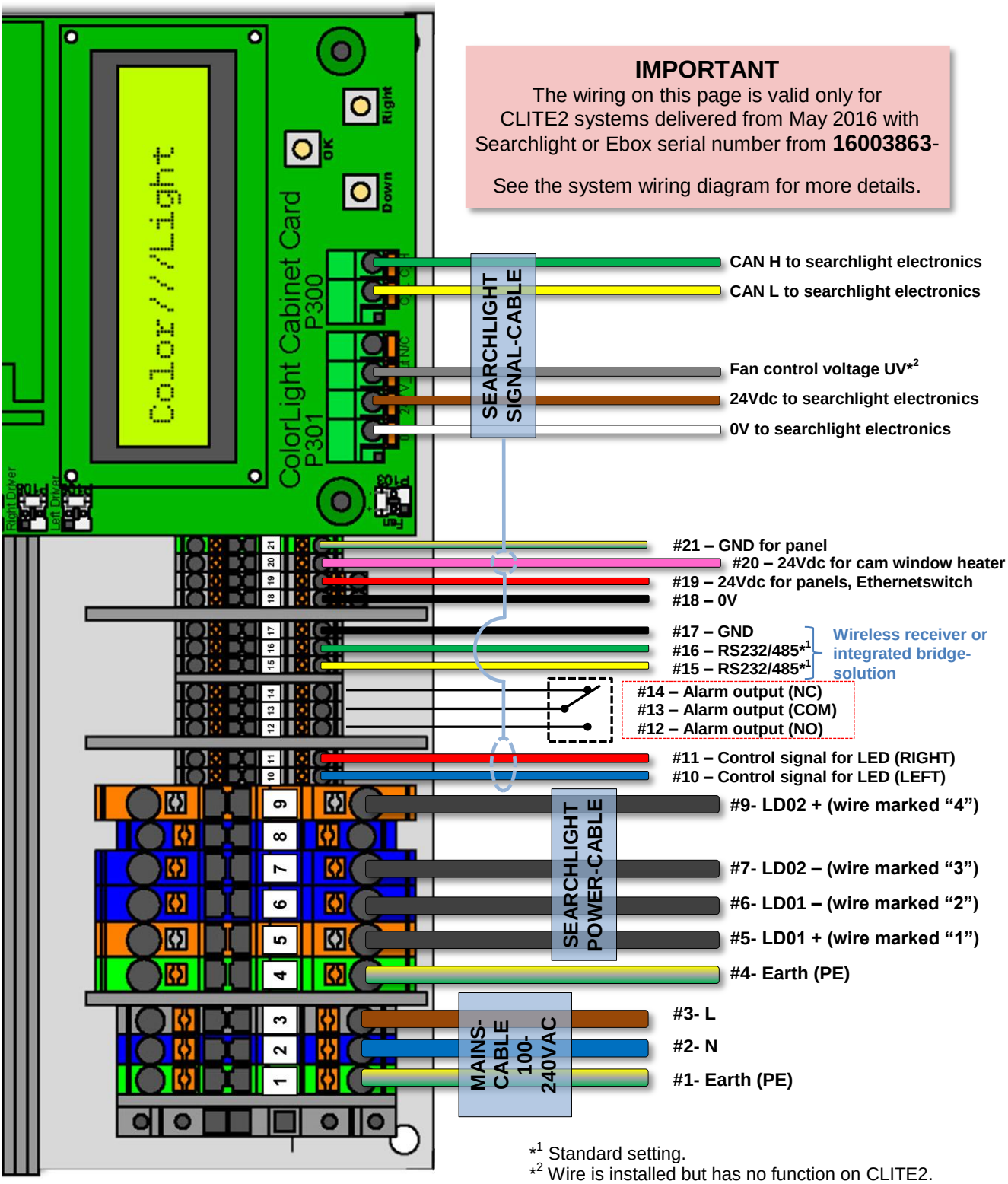
*1 Standard setting.
*2 Wire is installed but has no function on CLITE2.

9.5 CLITE2 electrical-box overview (100-240VAC)



9.5.1 **CLITE2 electrical-box connection (100-240VAC)**

This connection diagram shows our standard connection for CLITE2 with electrical box supplied with **DC voltage**. Deviations may occur for customized solutions.



*1 Standard setting.
*2 Wire is installed but has no function on CLITE2.

9.6 Operator panel connections

The operator panel is designed to be immersed into the bridge panel, for dimensions, see drawing in section 17.2.1 Operator Panel.

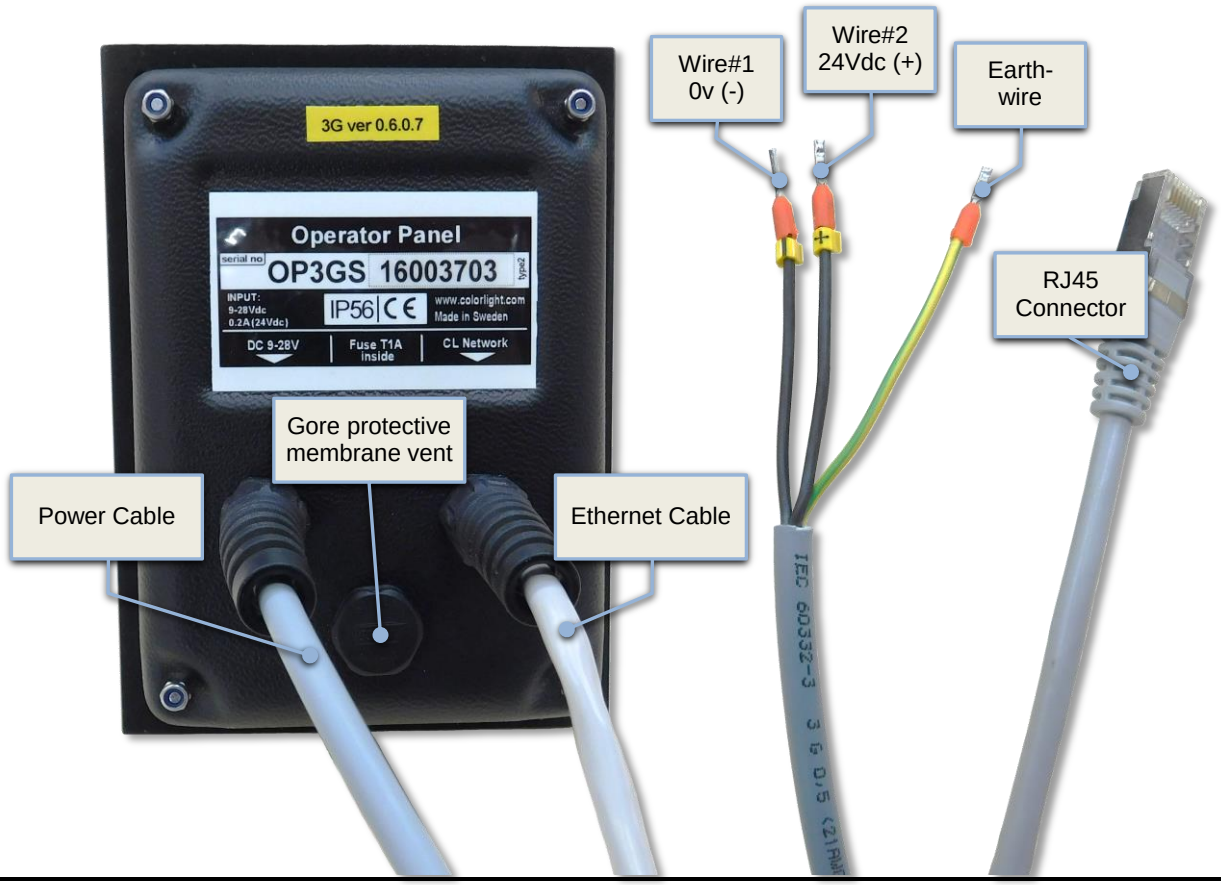
The following connections are available on the back of the panel:

1. Power supply 9-28 VDC via local power supply on the boat or 24VDC via terminals in the E-box. One of the benefits of supplying power to the panel from the box is that the panel will be de-energized together with the e-box via the main switch.

2. Ethernet connection directly to the electrical cabinet or Ethernet switch via RJ45 connector. Shielded Keystone Modular Feed through Coupler, RJ45-RJ45 included.

3. Earth connection to the panel, this is needed to suppress electrical disturbances and prevent ESD discharge damaging.

Electrical protection:
The panel is protected against wrong polarity and over-current protected by an internal, type: T1A (Slow-Blow glass fuse 5x20mm).

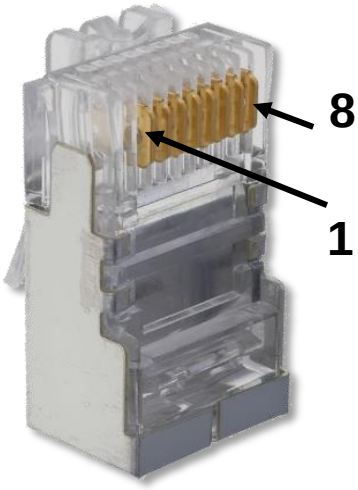


9.7 Ethernet wiring

Colorlight searchlight systems should be connected to their own dedicated network; they should never be connected into the vessels existing computer network.

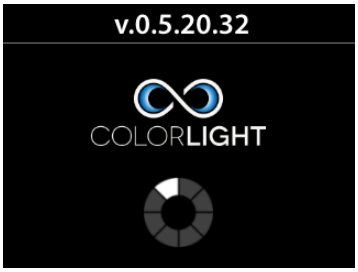
An Ethernet cable supplied from Colorlight complies with the standard **TIA/EIA-568-B** and is always tested together with the complete searchlight system to ensure full functionality.

If customers choose to assemble their own Ethernet cables they must be of type FPT Cat5 or better and the connections should be done according to the following information.

Pin	T568A Pair	T568B Pair	T568A Color	T568B Color	Pins on plug face
1	3	2	white/green stripe	white/orange stripe	
2	3	2	green solid	orange solid	
3	2	3	white/orange stripe	white/green stripe	
4	1	1	blue solid	blue solid	
5	1	1	white/blue stripe	white/blue stripe	
6	2	3	orange solid	green solid	
7	4	4	white/brown stripe	white/brown stripe	
8	4	4	brown solid	brown solid	

Note that the only difference between T568A and T568B is that pairs 2 and 3 (orange and green) are swapped. Both configurations wire the pins "straight through", i.e., pins 1 through 8 on one end are connected to pins 1 through 8 on the other end. Also, the same sets of pins connect to the opposite ends that are paired in both configurations: pins 1 and 2 form a pair, as do 3 and 6, 4 and 5, and 7 and 8.
One can use cables wired according to either configuration in the same installation without significant problem. The primary thing one has to be careful of, is not to accidentally wire the ends of the **same cable** according to **different configurations**

10. ACTIONS AFTER INSTALLATION AND POWER FAILURE



At system startup, the panels will start to scan the network to find connected electrical boxes, during this time, the panel software version will be displayed.
If not the panel made contact by displaying home screen within 30 seconds, it may be due to the following:

- Electrical box is not turned on, applies only if the panel has a separate power supply.
- There are problems in the network cabling between the electrical box and the operator panel.

10.1 Automatic recovery of stored searchlight position in panel.

A new feature was introduced with the release of the control software, **v 0.5.23.35** for ebox and **v 0.6.0.7** for the operator panels, from these versions this is a standard feature*.

With this new feature the system always stores the searchlight position after the movement has been idle for 20 seconds. The position is stored in in a non-volatile memory.

When the system is restarted after power loss, the last stored position will automatically be reloaded in to the panel.

10.1.1 The panel position indicator differs from the actual position of the searchlight.

At boot up, the panel position indicator can differ from the searchlight actual position for the following reasons:

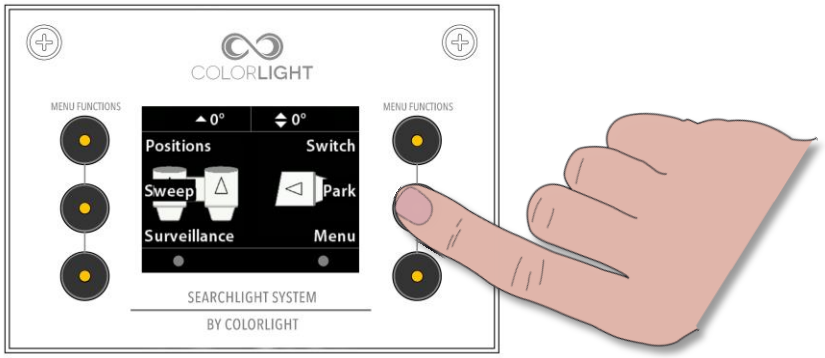
- The system power was interrupted in the middle of a joystick maneuver.
- The searchlight had just been maneuvered but the power interruption occurred before the 20 seconds elapsed and therefore the new position was not stored.
- The searchlight axis has turned away from latest stored position while it was switched off, manually or by wind gusts.

Positional deviations depending on the above will be automatically corrected when the next “Park” is commanded.

Note: always synchronize before setting sweep*, fixed positions* or surveillance* to ensure that the system is not rebooted with deviating positions, please see *10.2 Synchronize the system.*

*Older systems can be updated, please contact us for more information.

10.2 **Synchronize the system**



The easiest way to synchronize the system after reboot is to enter the quick start menu and select the “**Park**” function; the system will then activate the horizontal and vertical movement until the searchlight absolute position sensors sends their signals back to the control system and thereby updating it with the correct positioning.

If a parking position has been set, the searchlight will end this procedure by parking.
If necessary the origin can be set after the steps above to give an accurate readout of the indicator. To set the origin, please see 15.8.5.1 Store origin.

11. STARTING SYSTEM

When the system is in sleep mode the buttons and symbols glows with orange light and the display is totally shut down to save power. Buttons and symbols are always active but dimmed to a lower intensity during sleep mode.

Pressing any button on the operator panel will activate the system and the display will now show the position indicator image, buttons and symbols are now brighter.
Buttons, symbols and display intensity can be adjusted, please see *15.8.1 Backlight brightness.*

12. JOYSTICK FUNCTIONS

The joystick (**8**) moves the searchlight horizontally and vertically. There are no limitations to the movement of the searchlight thanks to the slip ring technology developed by Colorlight.
The more the joystick is moved to its end position the faster the searchlight rotates.
Searchlight rotation speed can be set, see *15.8.4 Maximum rotation speed.*
The vertical axis reaction to the joysticks movement can be reversed if decided by operator. To change this reaction please see *15.8.3 Joystick direction.*

The joystick can also be used to navigate in menus containing more than one choice.
Move the joystick up or down to navigate in the menu. In most menus joystick moved to the right will act as "**OK**" button and moved to the left will go back one step as the "**Back**" button.

13. SWITCH ON LIGHT

This searchlight is equipped with two LED lamp modules.
As default both lamps will be turned on by pressing button (**2**) or (**5**), both lamps will be **soft started with a slight delay in between** *[1], no matter which button is used.
To turn off the light, press button (**2**) or (**5**) again.

There are however occasions when it may be useful to give each lamp a dedicated light button, this setting is done in the "Single lamp mode" menu, please see *15.8.5.5 Single lamp mode.*

In the bottom part of the display there are two sun-symbols that indicates the status of the LED-lamps.

*1 The LED soft-start function is optimized to prevent a high inrush current during startup.

14. QUICK START MENU

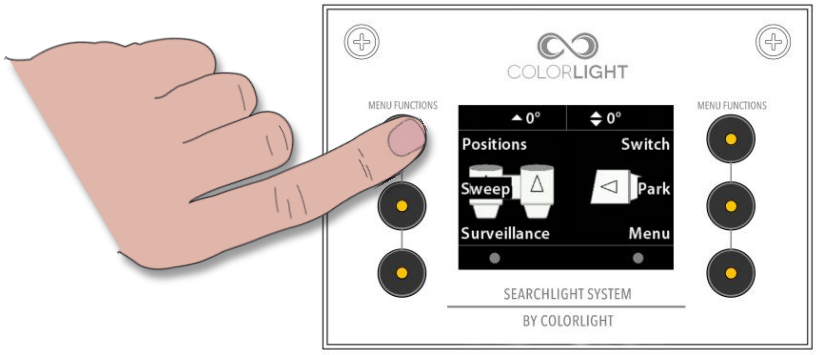
The operator panel features a quick start menu where you can reach some of the searchlights functions.

To open up the quick start menu, press any of the quick start menu buttons (**1**) when showing the logo or indicator page. The quick start menu will close after 5 seconds.

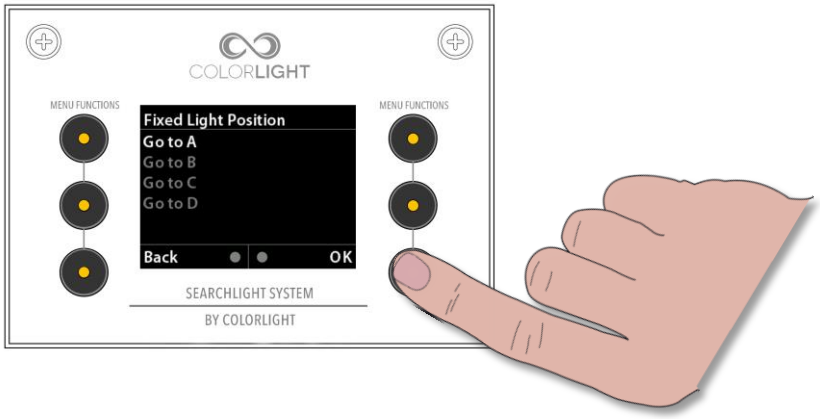
14.1 Fixed positions (optional function)

Fixed position is an option for the Colorlight Searchlight System and can only be accessed if activated.
There are up to four different programmable fixed positions in Colorlight Searchlight System.

14.1.1 Go to fixed position



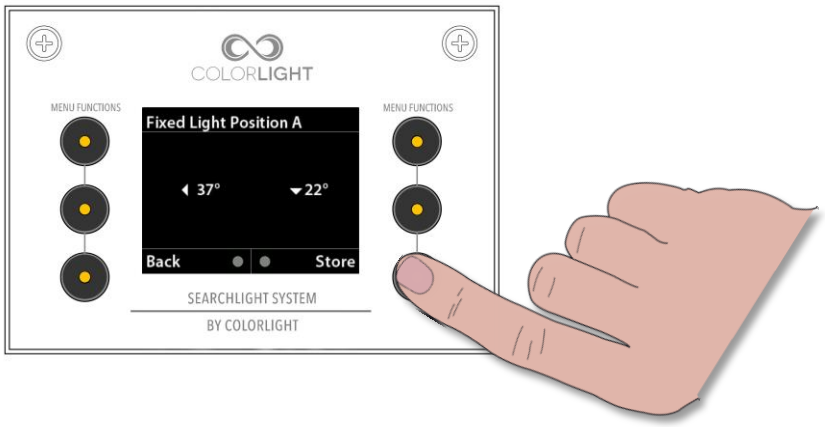
To enter the *"***Fixed Light Position***"* submenu, open up the quick start menu and press the upper left button "**Positions**".



There are up to four fixed position memories (**A, B, C** and **D**) which can be individually programmed.
By selecting one of the positions the menu will change and show the current direction of the searchlight in degrees and move the searchlight to this preprogrammed position automatically.

14.1.2 **Store fixed position**

If no position has been stored or the searchlight is already at the stored position it will not move.



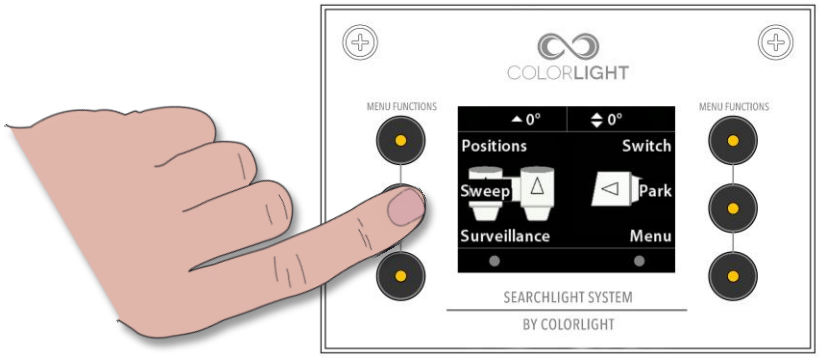
To store a new or change a fixed position, enter one of the regarded memories (**A, B, C** or **D**) in the menu. If there is already a preprogrammed fixed position stored at the selected memory, the searchlight will start to move to that position. Either select a free memory or, if you want to change this item, take control over the searchlight by moving the joystick (also aborting an eventual movement of the searchlight).
Now – by using the joystick - move the searchlight to the desired new position and press "**Store**".
The current position is now stored.
Note that you always overwrite a previously stored position.

14.2 **Sweep (optional function)**

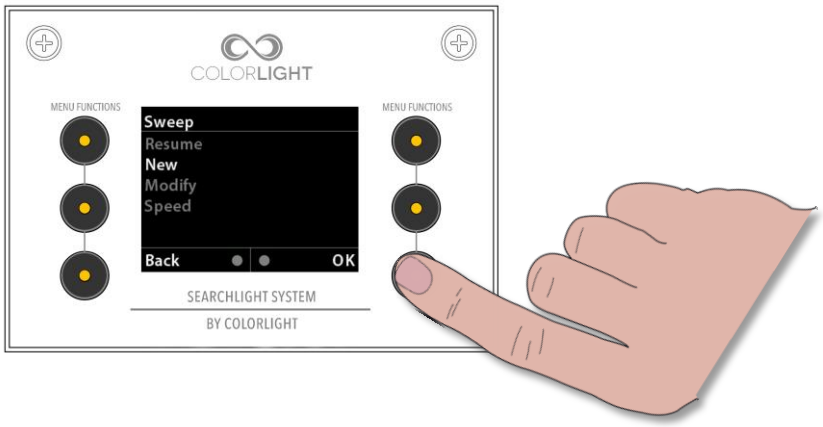
Sweep is an option for the Colorlight Searchlight System and can only be accessed if activated.

At sweep mode, the searchlight automatically moves back and forth between two individually programmable positions in the horizontal plane.

14.2.1 **New Sweep**



To enter the *"***Sweep***"* submenu, open up the quick start menu and press the left middle button "**Sweep**".

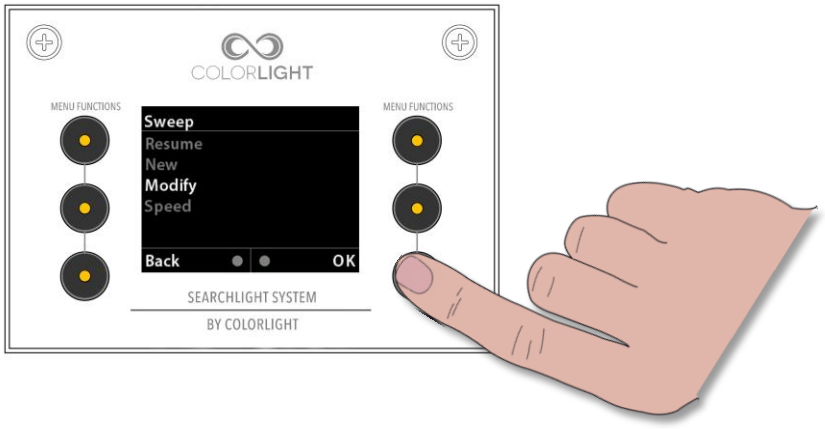


To start a new sweep, navigate down to "**New**" in the "**Sweep**" menu and press "**OK**".
The default setting for a sweep is a horizontal sweep of 20°.

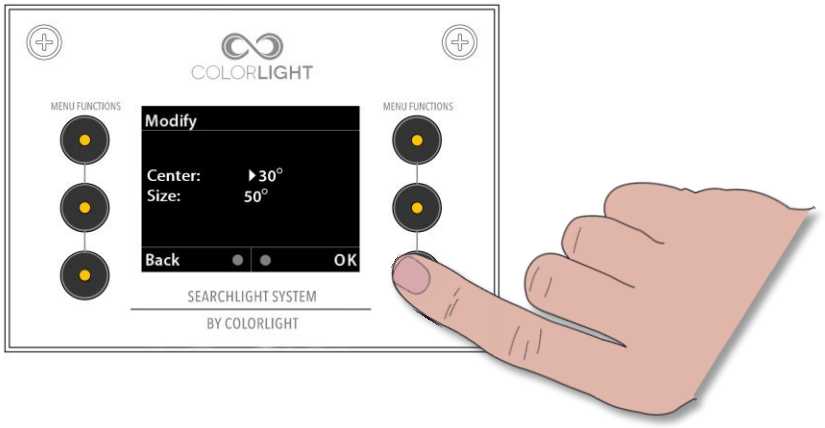
To stop a sweep enter the *"***Sweep***"* submenu and choose "**Stop**" or just move the searchlight by using the joystick.

To resume the sweep enter the *"***Sweep***"* submenu and choose "**resume**".

14.2.2 **Modify sweep parameters**

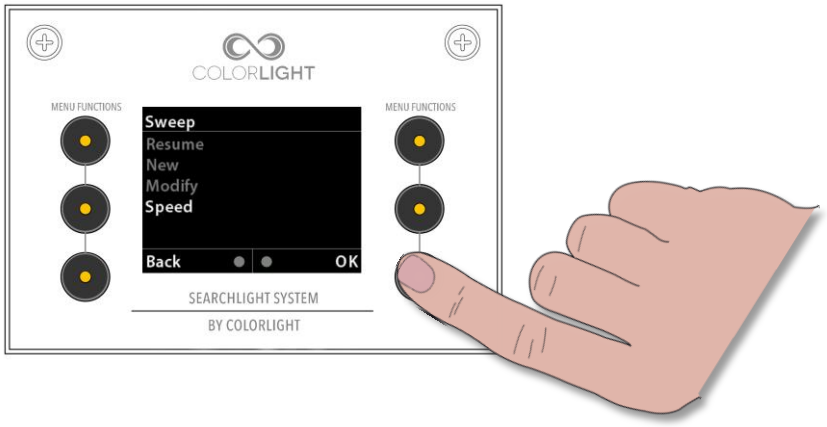


To modify the sweep angle and / or the center of the sweep enter the "**Sweep**" menu and navigate down to "**Modify**", press "**OK**".

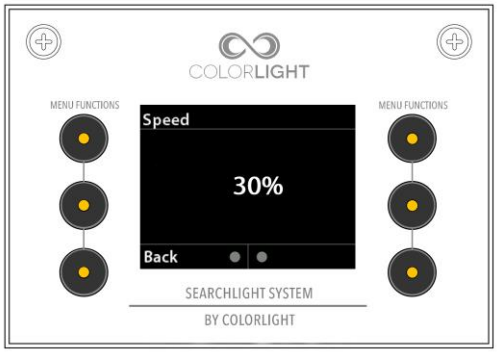


This menu changes the sweep angle and center point of the sweep, modification can be carried out both during movement and while searchlight is standing still.

To change the center point of the horizontal sweep move the joystick to the left or right until the desired center point is reached.
To change size of the sweep angle move the joystick up or down.
Press "**OK**" to save and update the searchlight with the new values.



The default speed of the sweep is set to 50% of the maximum speed of the searchlight. To change the speed of the sweep enter the "**Sweep**" menu and navigate down to "**Speed**". Press "**OK**" to enter the "**Speed**" submenu.



To change the speed move the joystick up or down to desired speed, press "**OK**" to update the searchlight with the new speed.

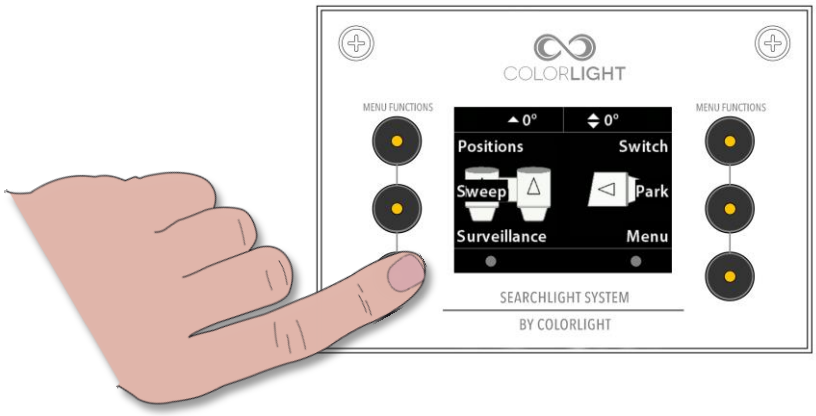
Note: If the rotation speed is updated during runtime this will effect only after the searchlight has reached its next end point.

14.3 **Surveillance (optional function)**

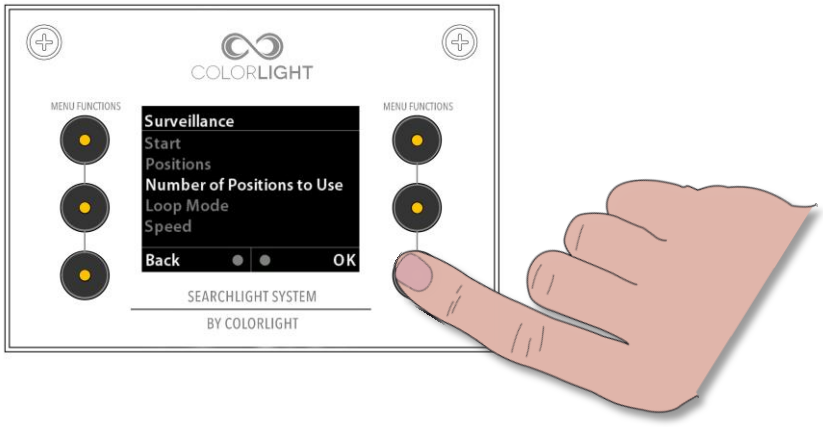
Surveillance is an optional function for the Colorlight Searchlight System and can only be accessed if activated.
This is an advanced sweep, where up to five different points, at any azimuth and elevation can be set for surveillance.

14.3.1 **Setting a new surveillance sweep**

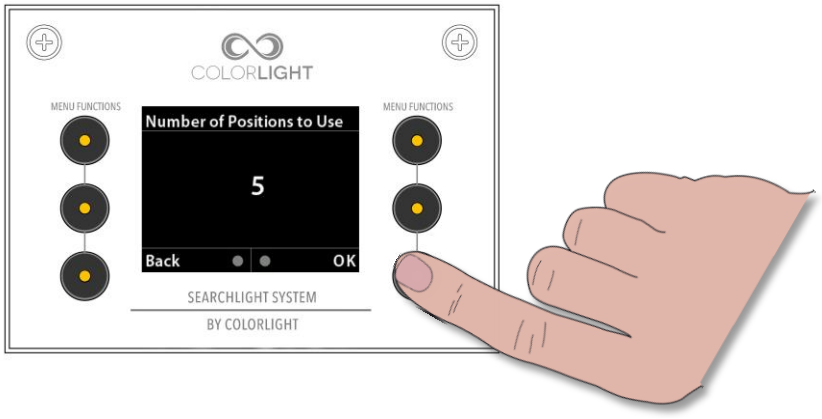
To set a new surveillance sweep the number of positions must first be set.



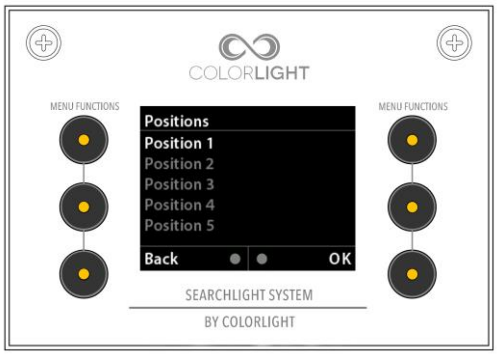
To enter the "**Surveillance**" submenu, open up the quick start menu and press the bottom left button.



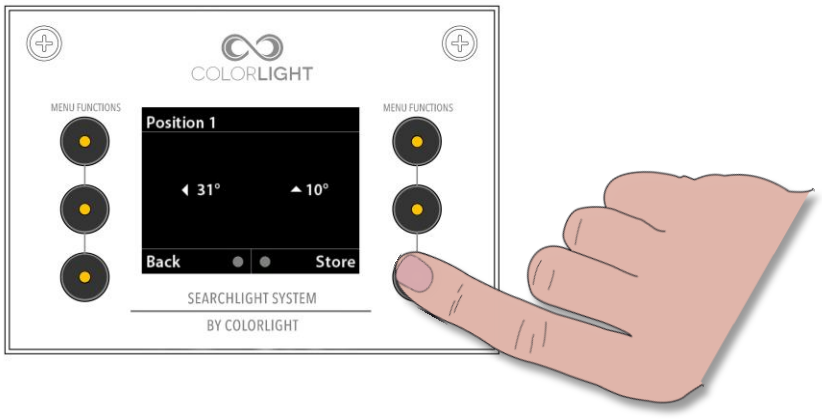
Navigate down to "**Number of Positions to Use**" and press "**OK**".



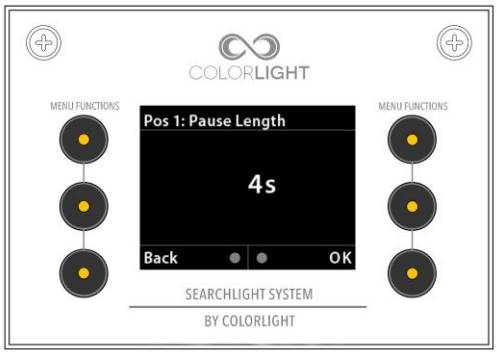
Select the requested number of positions (max. five) to be used in this surveillance sweep.
Press “**OK**” to save and return to the “**Surveillance**” submenu.



To set the positions in a surveillance sweep enter the “**Positions**” menu in the “**Surveillance**” submenu.
The selected number of positions is shown in the display.



To set a position, enter the desired position, then move the searchlight to the by using the desired position by the joystick. Press “**Store**” to store each position.

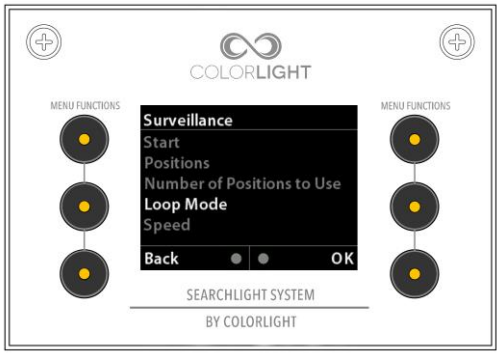


After pressing "**Store**" a new menu will appear, "**Pause Length**". This defines how long the searchlight will rest at this position before starting to move to the next position. Pause length can be set between zero and ten seconds.

Repeat this for the desired number of positions.
When done go back to the "**Surveillance**" submenu by pressing "**Back**".
Navigate to "**Start**" and press "**OK**" to start the surveillance sweep.

The surveillance sweep will start from position one and go to position two and so until the searchlight has come to the number set in "**Number of Positions to Use**"

14.3.2 **Changing surveillance settings**

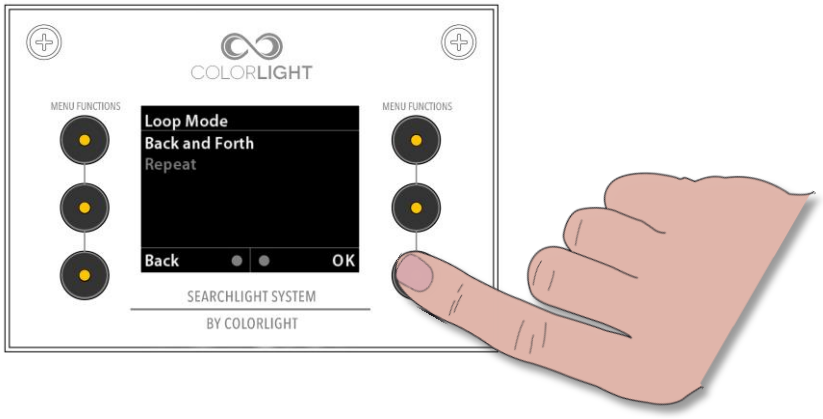


Surveillance has a couple of different settings, "**Loop Mode**" and "**Speed**".
In "**Loop Mode**" there are two choices, "**Back and Forth**" and "**Repeat**".

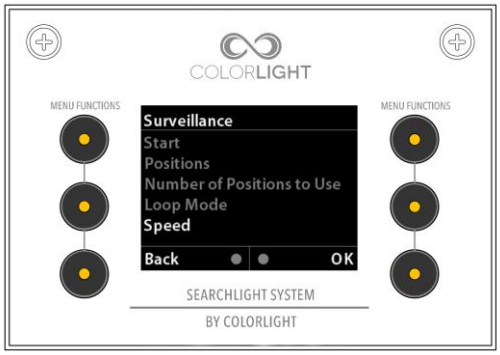
To set "**Back and Forth**" or "**Repeat**" enter the "**Surveillance**" submenu then "**Loop Mode**".

When using "**Back and Forth**" the surveillance sweep will go from position one to two and so on until it reaches the last one set in "**Number of Positions to Use**". Then it will start calling these positions in reverse order!

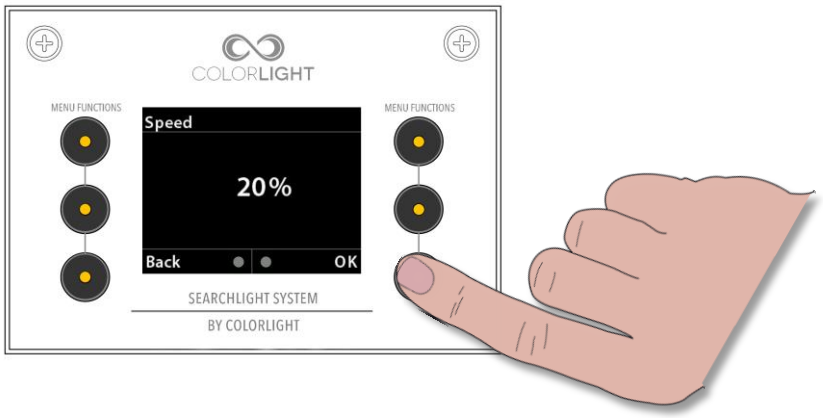
When using "**Repeat**" the surveillance sweep will go from position one to two and so on until it reaches the last one set in "**Number of Positions to Use**".
From there it will start the same sequence at position one instead of going to the previous position.



Navigate to the preferred setting and press "**OK**" to save the setting and return to the "**Surveillance**" menu.



"**Speed**" is where the speed of the rotation of the searchlight is set. Default setting is 50% of maximum speed of the searchlight.
To change the actual speed of the surveillance sweep enter the "**Surveillance**" submenu then "**Speed**".

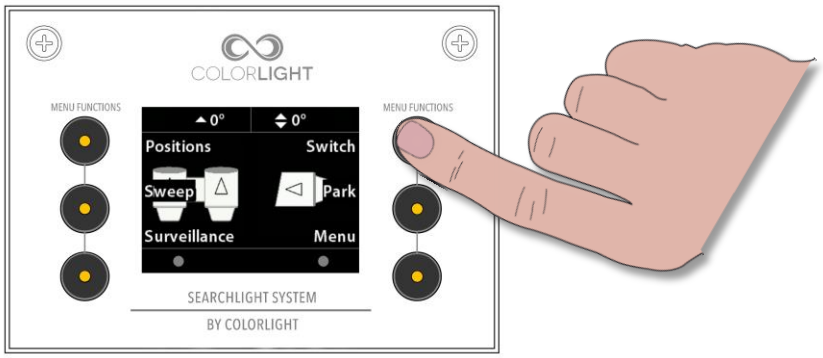


Change the setting by moving the joystick up or down in the speed menu until the requested value is shown. The speed can be set between 5-100% of the maximum rotation speed.

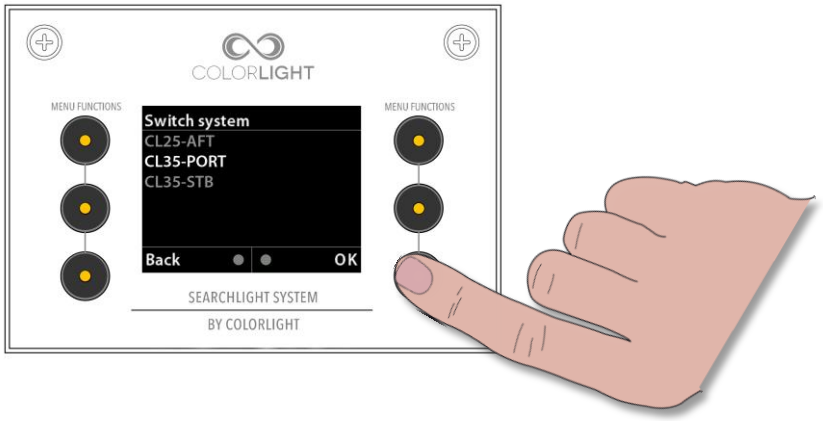
Note: If the rotation speed is updated during runtime this will effect only after the searchlight has reached its next end point.

14.4 **Switch**

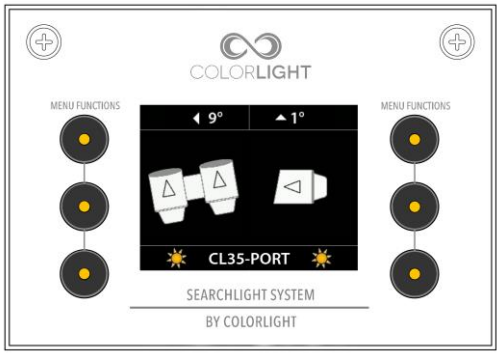
If there are more than one Colorlight searchlight in the system any operating panel can control any of the connected Colorlight searchlights. Every searchlight should be given a unique name during installation for this to work properly.



To enter the "**Switch**" submenu open up the quick start menu and press the upper right button.



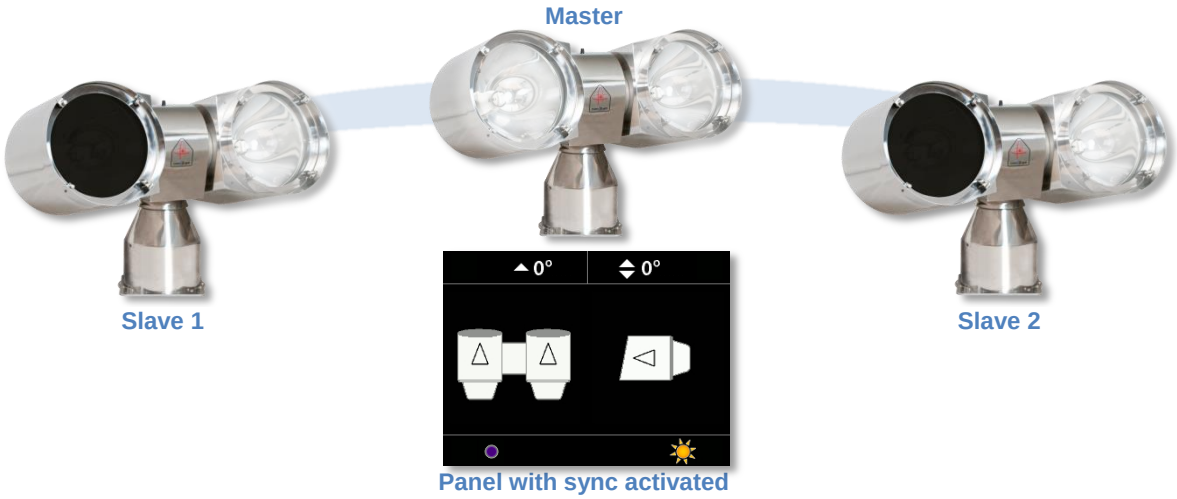
In this menu all the available searchlights should be listed. To change which searchlight being controlled, navigate to the desired searchlight and press "**OK**".



The operating panel should now control the newly selected searchlight which is shown on the indicator page.

14.5 Synchronized control

This function is available in the “**Switch**” submenu if there is more than one Colorlight Search Light in the network and at least one operator panel has the option "**Synchronized control**" enabled. The feature gives the user control over multiple searchlights at the same time from a single operator panel and can therefore obtain optimal light on the same area.
For this feature to be easy to handle, the searchlights should be given a unique name, for example by mounting location on the boat, please see *15.8.5.3 Name system.*



Panel with sync activated

The following basic functions will be synchronized if “Sync” is enabled in the operator panel:

- **Horizontal and vertical movement** based on position, i.e. there may be a small discrepancy during real-time movement with joystick but the final position will always be identical on all synced system when movement stops.

- **Light / on off,** white light button will turn on and off all the white lights on master and synchronized slaves and UV button does the same with any UV light.

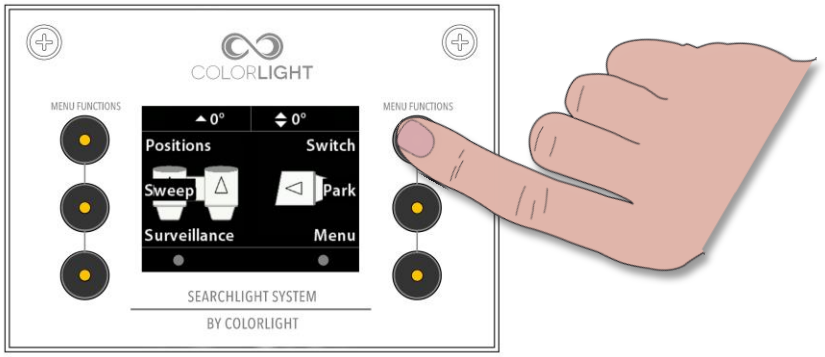
- **Off and park,** if the parking command in panel is selected, the master and all connected slaves will simultaneously turn off the lights and park.

The Sweep, Fixed positions or Surveillance features will not be synchronized, but only started on the searchlight in the network that the operator panel points to, even if this searchlight is the master.

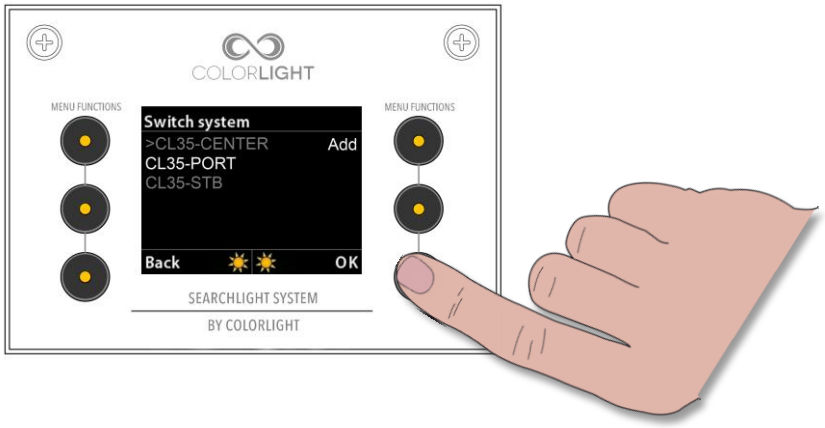
Important, the following settings must have been performed during installation or power failure on each of the systems in the network before they can be included in the synchronized group control.

- Actions after installation or power failure please see *10. ACTIONS AFTER INSTALLATION OR POWER FAILURE.*

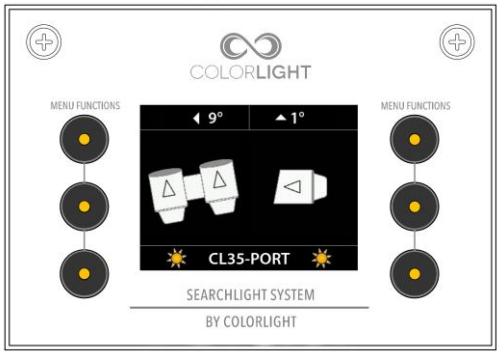
- *Store origin, please see 15.8.5.1 Store origin.*



To enter the "**Switch**" submenu open up the quick start menu and press the upper right button.



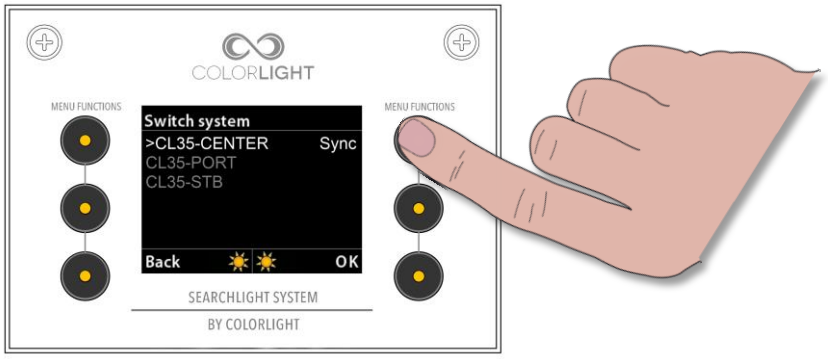
In this menu all the available searchlights should be listed. To change which searchlight being controlled, navigate to the desired searchlight and press "**OK**".



The operating panel should now control the newly selected searchlight which light status and position is shown on the indicator screen.

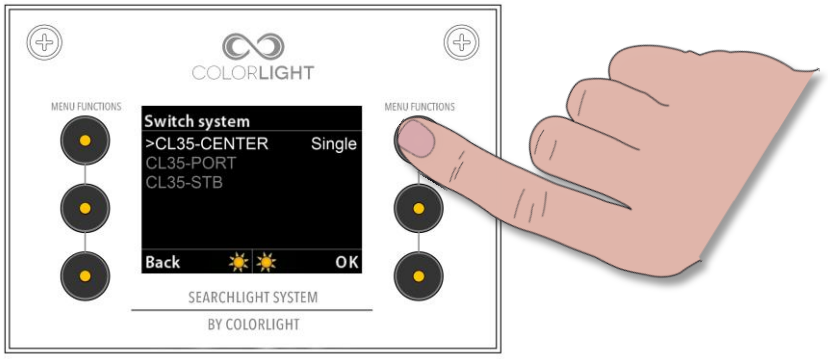
14.5.1 **Set the master control searchlight on/off**

The master is the searchlight that you actively control with your operator panel and it is the master's indicator and error message that is displayed in the operator panel display.
Light icons however, changes to the configurations that are available in the group at the moment.
If the master has two white lights (11) and you add a slave who has one white and one UV (12), the master's indicator field will immediately update so that there is a UV light available in the group.



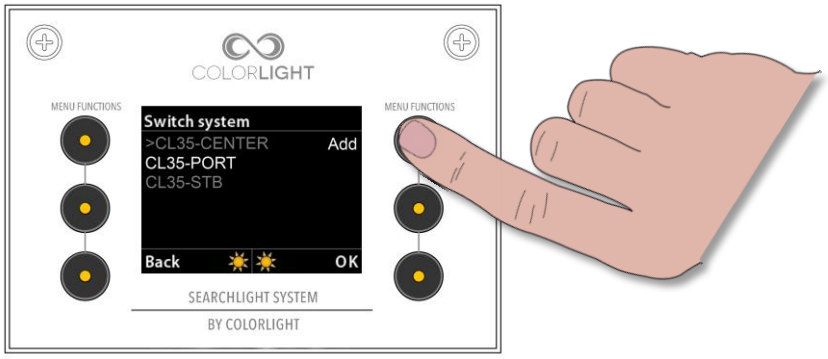
Once you have switched over to the searchlight which you want to be master in the system, press the "**Sync**" button, In this case, we choose CL35 CENTER as our master.
The arrow in front of the selected CL35 CENTER tells us that this system is the "master" in the network and if the sync function is activated all the slaves will follow the masters movement.

Important, to add and remove slaves, please see *14.5.2 Add and remove slaves.*

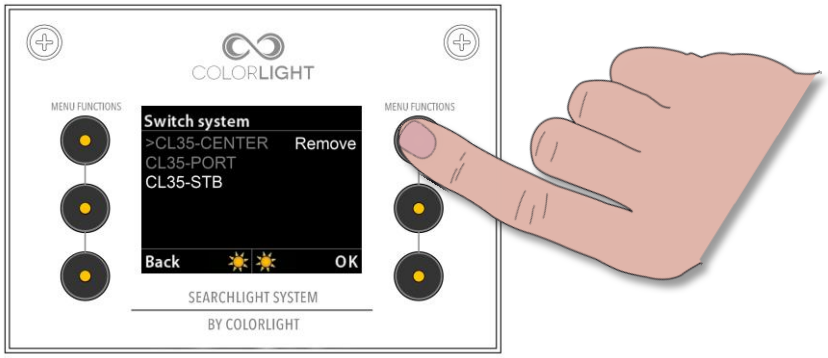


To disconnect the master and run the CL35 CENTER searchlight as a single searchlight go into the "**Switch**" submenu, navigate to the master searchlight and press the *"***Single***"* button.

14.5.2 **Add and remove slaves**

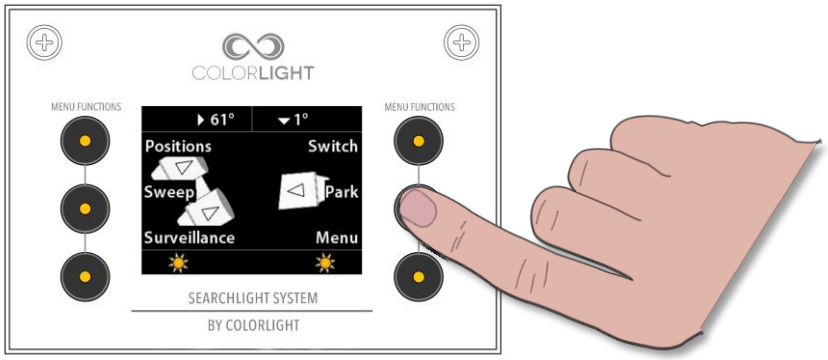


Add or remove one or more slaves is done by entering the "**switch**" submenu and with the joystick scroll through the list of available searchlights, If the searchlight in the list is not connected in the synchronized group control, the text "**Add**" appears next to the top left button, to add this searchlight to the group, press the "**Add**" button.



If the searchlight marked is already listed as slave in the group, the text "**Remove**" appears next to the top left button, to remove this searchlight from the group, press the "**Remove**" button.

14.6 **Off and park**



By pressing the button next to "**Park**", any lighted lamp will be turned off and the searchlight will automatically look up the preprogrammed parking position, during this time you'll see "**Parking ...**" in the bottom middle of the display.
When parked, the operator panel will turn off the display after a few seconds and the LEDs behind the buttons will be dimmed to a lower intensity.

15. MAIN MENU

From the quick start menu, select *"***Menu***"* to enter the system's main menu.
To navigate in the main menu, use the joystick; push the joystick forward/up once to go up one step in the menu and backwards/down to go down one step. Keep holding the joystick up or down will scroll up and down in menus with “autorepeat”.

To confirm your choice use "**OK**" button and to leave the displayed menu, use the button *"***Back***"*. In many menus the joystick can be used as the “**OK**” button if moved to the right and as the “**Back**” button if moved to the left.

15.1 Off and Park

Please see *14.6 Off and park* for information regarding this menu choice.

15.2 Switch system

Please see *14.4 Switch* for information regarding this menu choice.

15.3 Light Position

Please see *14.1 Fixed positions* for information regarding this menu choice.

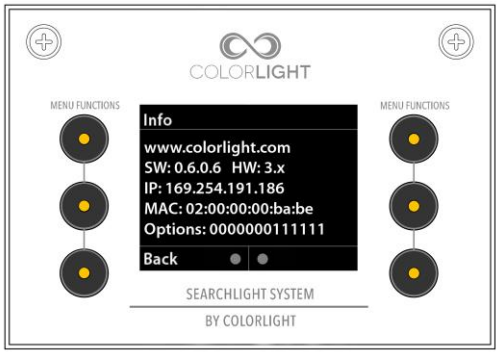
15.4 Sweep

Please see *14.2 Sweep* for information regarding this menu choice.

15.5 Surveillance

Please see *14.3 Surveillance* for information regarding this menu choice.

15.6 **Info**



This menu shows information that is needed to be known during support from Colorlight or if any optional functions should be added to the operator panel after purchase (more about this under *15.8.5.7 Options setup*).

15.7 **Status**

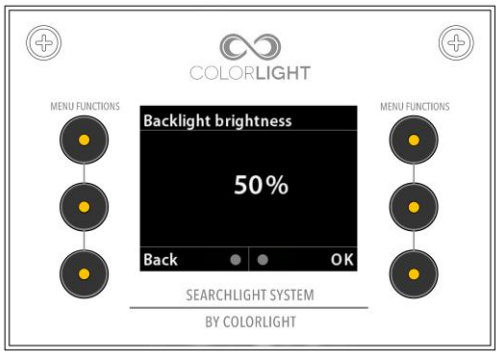
This menu will give information in form of text messages if there is errors.in the system, it also contains a "**Lamp-hour counter**" showing the accumulated total running time in hours for each LED-module.
Errors can be reset from this menu by simply press the button marked "**Dismiss**", if errors persist despite resetting, contact Colorlight.

Message	Fault	Remedy
Communication error	CAN bus transmission issues	Check for loose wires in the electrical box and contact Colorlight.
Over current	Overcurrent protection triggered, movement blocked	Check that the searchlight is able to rotate freely. In winter, heavy icing can be the cause of this error.
Over voltage	Overvoltage protection triggered, voltage to searchlight motordriver/s have exceeded 40Vdc.	Reset the error, if error recurs repeatedly, please contact Colorlight.
Under voltage	Undervoltage protection triggered, voltage to searchlight motordriver/s has fallen below 8,5Vdc	Reset the error, if error recurs repeatedly, please contact Colorlight.

15.8 **Settings**

This opens a new menu with six sub menus.

15.8.1 **Backlight brightness (adjust the button´s/ display light intensity)**



In this menu the intensity of the button LEDs and the display backlight can be adjusted between 5-100%.
The adjustment is done by moving the joystick forward for increasing the intensity and backward to decrease. The selected intensity is confirmed with "**OK**".

15.8.2 **Language**

The language in the display can be changed depending on which language sets that are installed in the operator panel.

Currently, the following languages are available (Q2 2016):
English, Swedish, Chinese, French, German, Italian, Portuguese, Russian.

If you find that your language is missing, please contact Colorlight

15.8.3 **Joystick direction**

Some operators want to have their joystick to move the lamp housing vertically in the same direction as the joysticks physical direction:

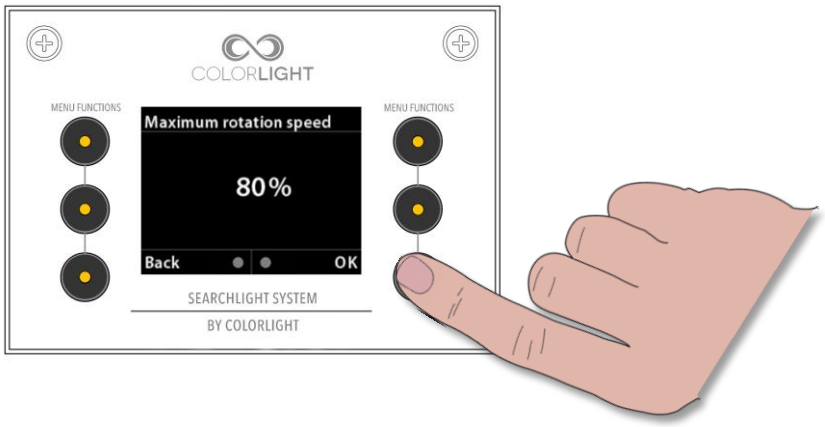
(joystick up=lamp housing moving upwards), this is called “**Inverted**” in the menu.

Normally the joystick acts like an aeroplane joystick:

(joystick up=lamp housing moving downwards), this is called “**Normal**” in the menu.

15.8.4 **Maximum rotation speed**

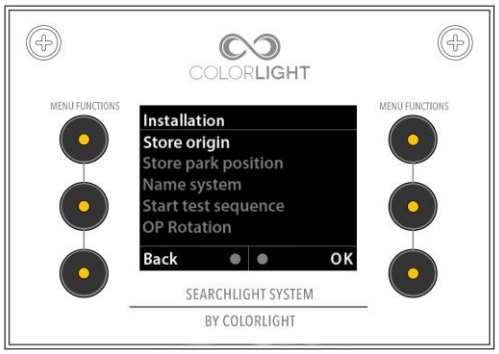
This menu gives the operator the opportunity to limit the actual maximum rotation speed of the searchlight in relation to its absolute maximum rotation speed.



The adjustment is done by moving the joystick forward to change speed in increments of 5% and backwards to decrease. Minimum speed is 20% and maximum 100%, when the choice is confirmed with "**OK**", the display jump back to the previous "**Settings**" - menu.

15.8.5 **Installation**

In this menu there are six sub menus each described below:



15.8.5.1 Store origin

This menu is used to calibrate the systems “ZERO” point for both vertical and horizontal axis.

Before the “**Store origin**” command is stored it is necessary that the synchronization between operator panel and electrical box is done properly. The easiest way to do the synchronization is by turning the system off with the “**Park**” command, please see *14.6 Off and park.*

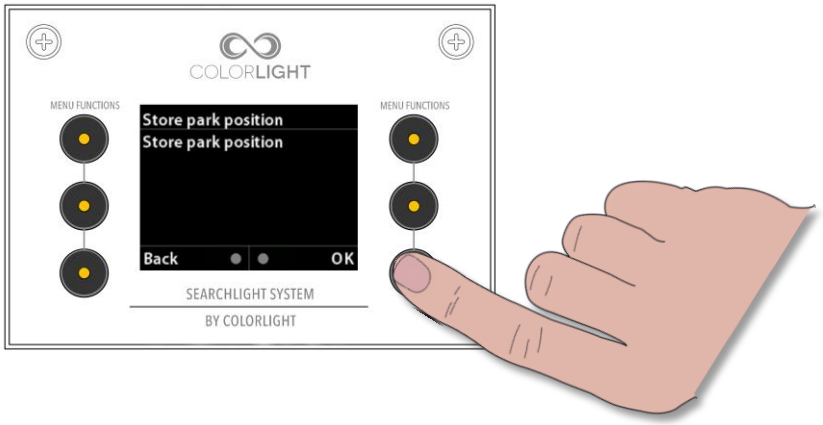
Start the system according to *11. STARTING SYSTEM* (normal start). Now the position of the lamp housings should be adjusted to be in level with horizontal plane and in direction straight forward of the vessel (normally)! Then “**Store origin**” is executed and setting is stored.

15.8.5.2 Store park position

This menu enables the storing of a park position (lamp housing pointing at any direction when the "**Park**" command is selected.

Before changing the default park position it's necessary that the synchronization between operator panel and electrical box is done properly. The easiest way to do the synchronization is by just turn the system off with the "**Park**" command, please see *14.6 Off and park.*

From the default logo screen or display indicator*-screen, move the searchlight to the new desired park position and when satisfied select **menu>settings>Installation** and enter sub menu "**Store park position**".

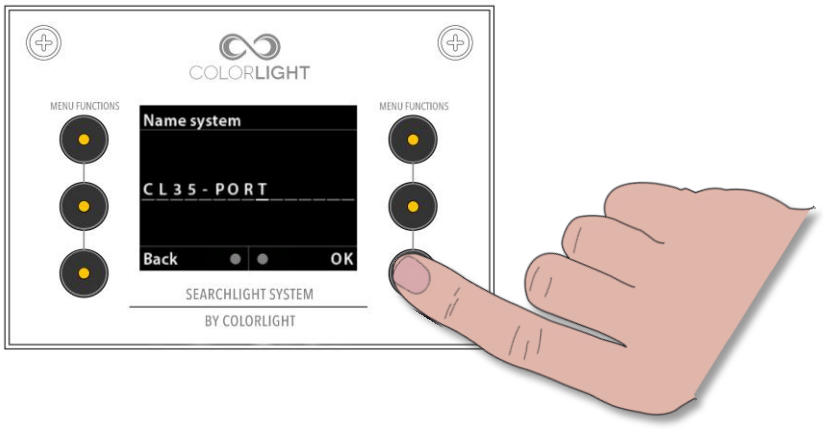


Press "**OK**" to save the new park position and return to the default logo screen or display indicator*-screen

Suitable park position for CLITE2 is pointing straight ahead 0/0 degree; this is also the default parking position

15.8.5.3 Name system

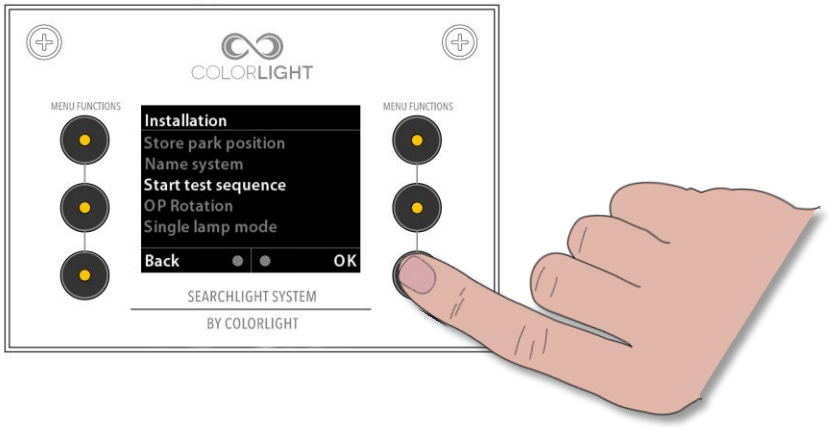
The dedicated Colorlight network can contain several searchlights and operator panels. To make the whole network easy to navigate; each electrical box and its corresponding searchlight can be named to a well-known name for the operator.



The name is set by moving the joystick up and down to select correct character. To move to next character in the name the joystick is moved to the right. Finish the name process and save the name by select "**OK**" by pushing the button at the right bottom corner of the display.

15.8.5.4 Start test sequence

This menu starts a test sequence which tests the movement of the lamp housings and focus for each lamp house one at a time.



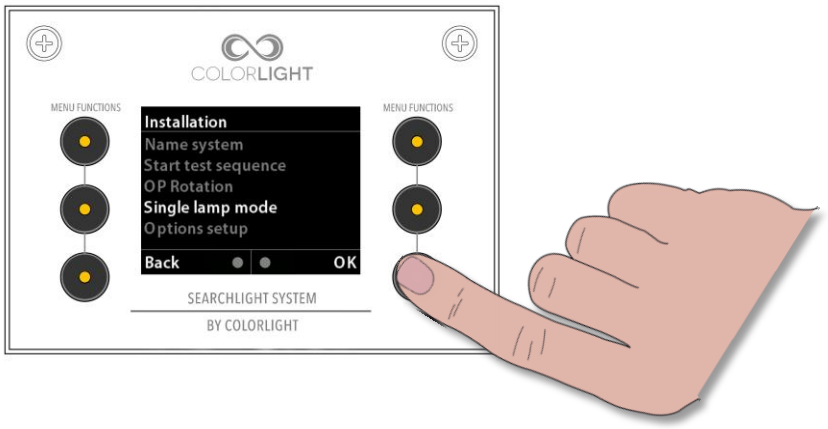
The test sequence will perform as follows:

At test sequence startup the lamp housing will be moved to parking position.
The horizontal axis will be rotated one full revolution clockwise.
The vertical axis will be rotated one full revolution clockwise.
The left lamp houses focus motor is activated during 10 seconds.
The right lamp houses focus motor is activated during 10 seconds.

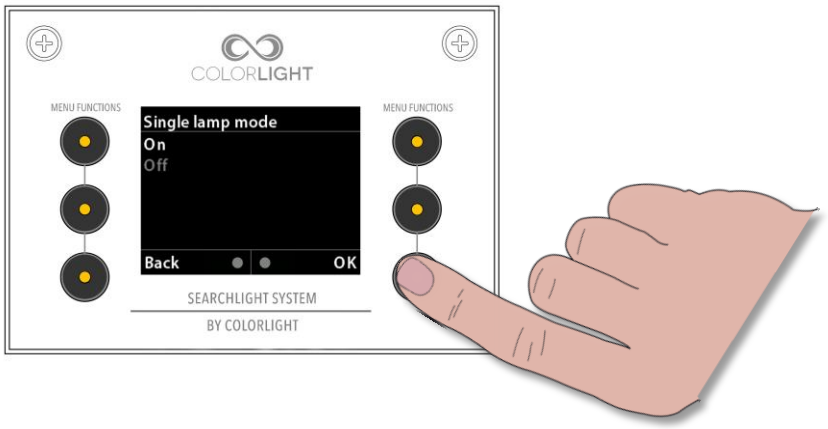
The whole sequence above will be repeated 5 times before the test sequence is automatically abandoned. Every even time the rotation will be anti-clockwise and every odd time the rotation will be clockwise. During the test sequence the operator can switch on and off lights by simply press the button (**2**) and (**5**) according to the figure in *5. OPERATOR PANEL, OVERVIEW.* The test sequence can't be abandoned by the operator without switching off the main power in the electrical box.

15.8.5.5 Single lamp mode

Note: Button numbers below refers to *OPERATOR PANEL, OVERVIEW*.



Normally, one wants to lit both LED-modules simultaneously and thereby obtain maximum light intensity with the push of a single button.
However, there are occasions when it may be useful to give each module a dedicated light button, this setting is done in the "**Single lamp mode**" menu.

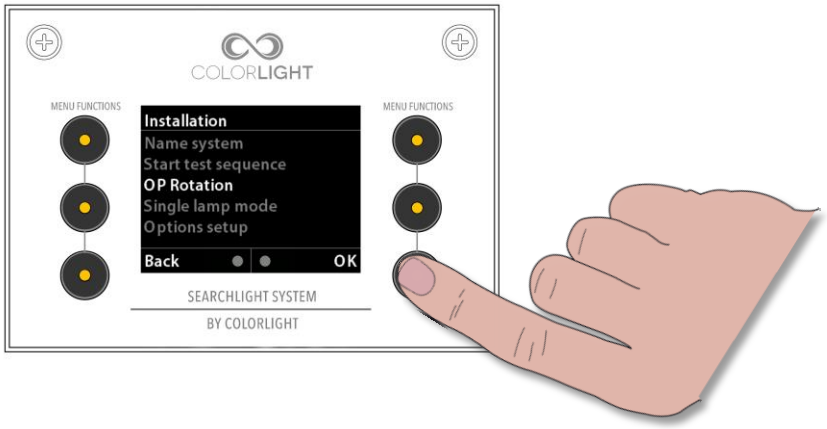


By selecting single lamp mode "**On**" and confirm by pressing "**OK**", the left LED will turn on / off by pressing the left light button (**2**) and right LED on / off by pressing the right light button (**5**).

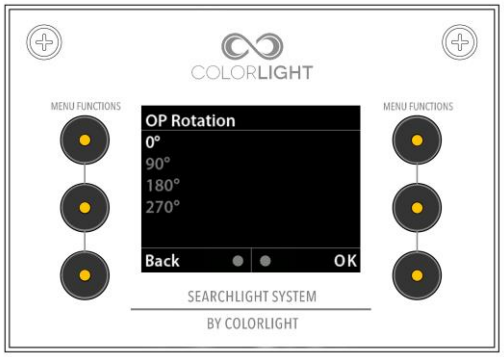
Note: The function "**park**" turns off both lights at the same time regardless of the setting in this menu.
The default setting at delivery is "both LED´s on" by pressing left light button (**2**) or right light button (**5**)

15.8.5.6 OP Rotation

This menu is used if you have mounted an operator panel pointing in a different direction than towards the bow of the boat.



The defaults setting when delivered (0 degrees) requires that the operator panel is mounted pointing towards the bow of the boat, *see illustration on page 54.*

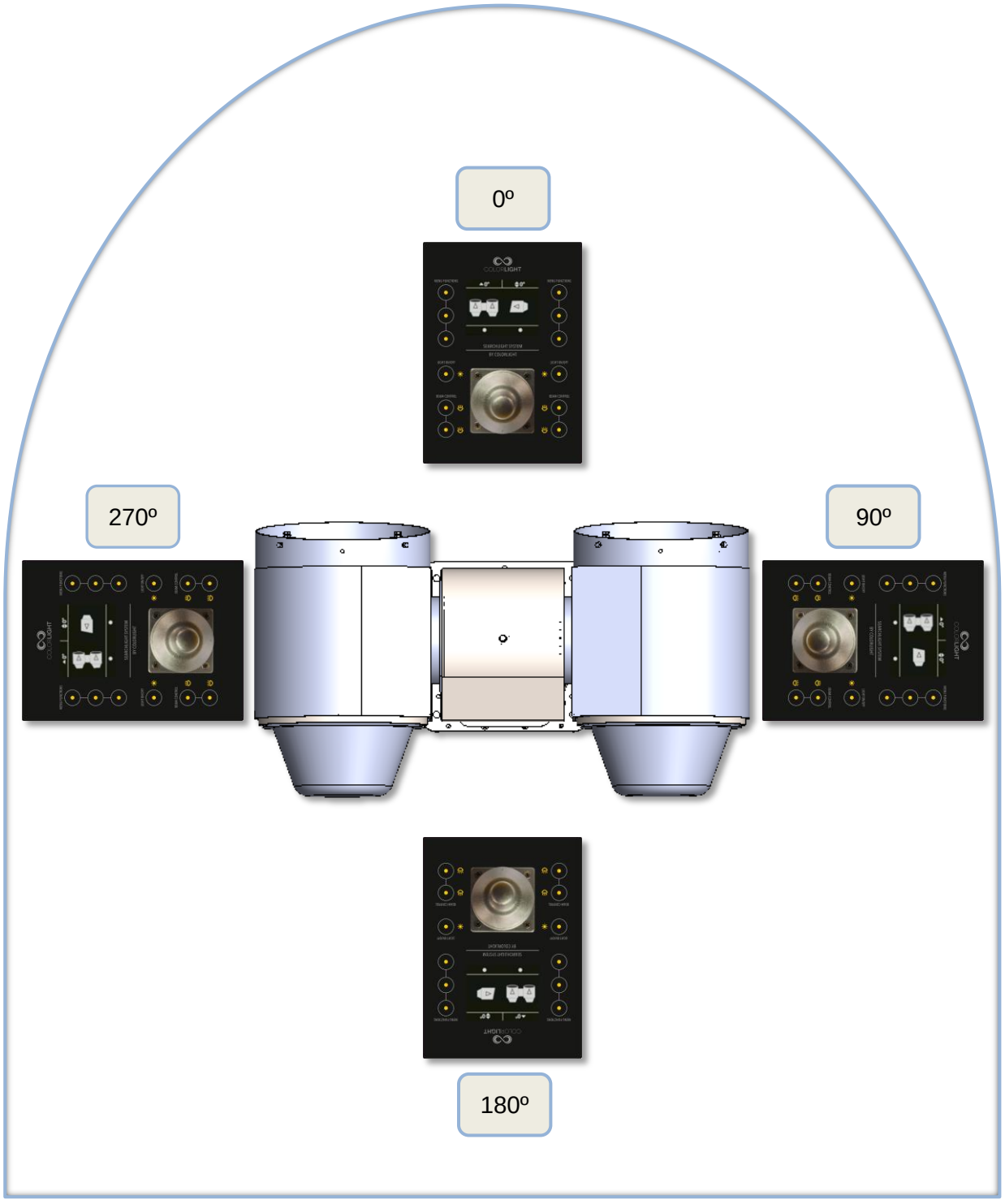


By changing this setting you can compensate for different mounting positions while maintaining accurate indicator function, you can choose from four different positions.

0 degrees (default)
90 degrees
180 degree
270 degree

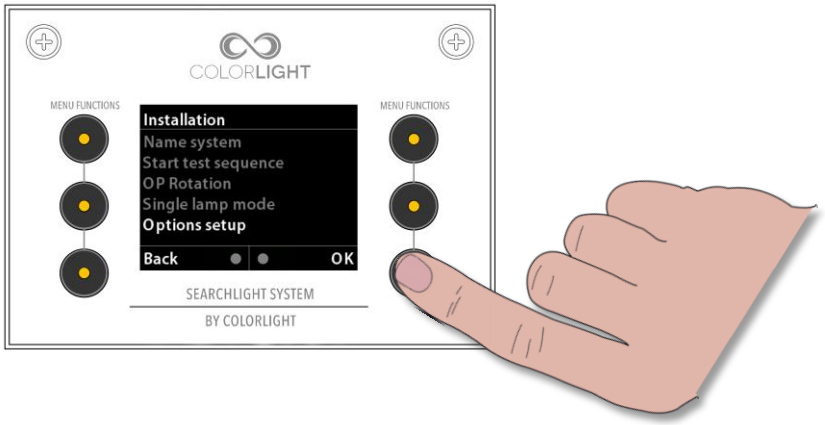
Press “**OK**” to save and exit back to the “**Installation**” submenu.

OP Rotation illustration.

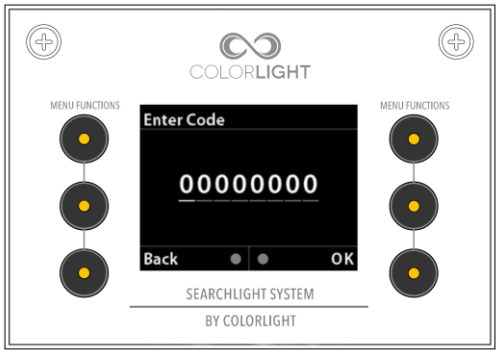


15.8.5.7 Options setup

This menu is used for installing unlock codes that provide access to additional options.



Press "**OK**" to enter the "**Enter Code**"-screen.



The code is entered by moving the joystick up and down to select correct character. To move to next character the joystick is moved to the right. Finish the process by select "**OK**" by pushing the button at the right bottom corner of the display

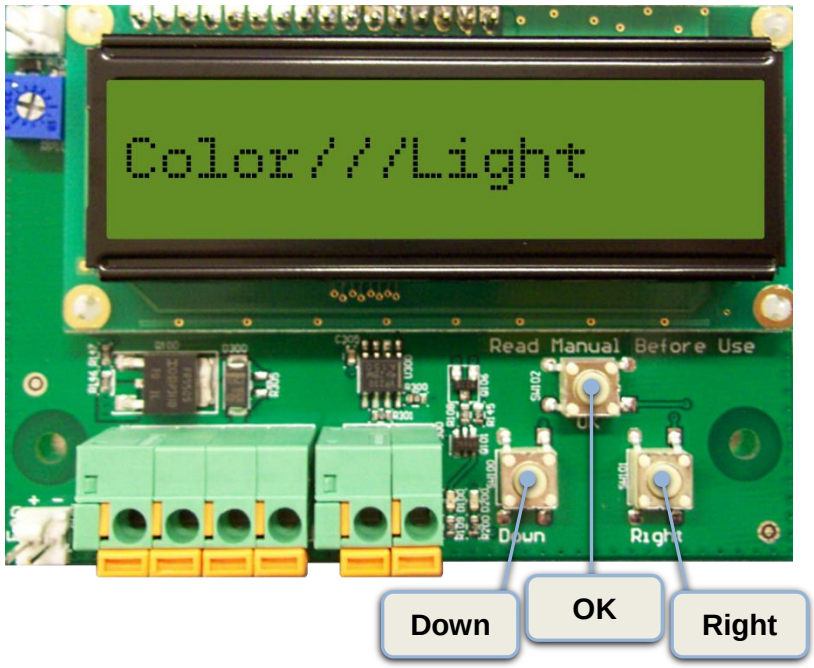
The codes are individual for each operator panel. For obtaining unlock codes please contact Colorlight for quotation. Colorlight also need the MAC-id of the related control panel to generate the correct code. Please see 15.6 Info.

The following options are available and can be directly accessed by entering a code:

Display indicator,
Fixed positions, please see *14.1 Fixed positions.*
Sweep (auto sweep horizontal), please see *14.2 Sweep.*
Surveillance, please see *14.3 Surveillance.*
Synchronized control, please see *14.5 Synchronized control.*
Language *15.8.2 Language.*

16. CABINET CARD MENU SYSTEM

This chapter describes the menu system of the Colorlight Cabinet Card displayed on the on-board LCD.



16.1 Menu navigation

The user interacts with the menu system using the three buttons, the "**Down**" button, the "**Right**" button and the "**OK**" button.

16.1.1 Down Button

The main function of the "**Down**" button is to shift between the menu categories. It also has two alternate generic functions.
1. While in submenus listing items of various types the "**Down**" button scrolls down in the list.
2. While entering a value of some sort, the "**Down**" button decrements that value.

16.1.2 Right Button

The main function of the "**Right**" button is to shift between the submenus of the selected menu category. It also has two alternate generic functions.
1. While in submenus listing items of various types the "**Right**" button scrolls up in the list.
2. While entering a value of some sort, the "**Right**" button increments that value.

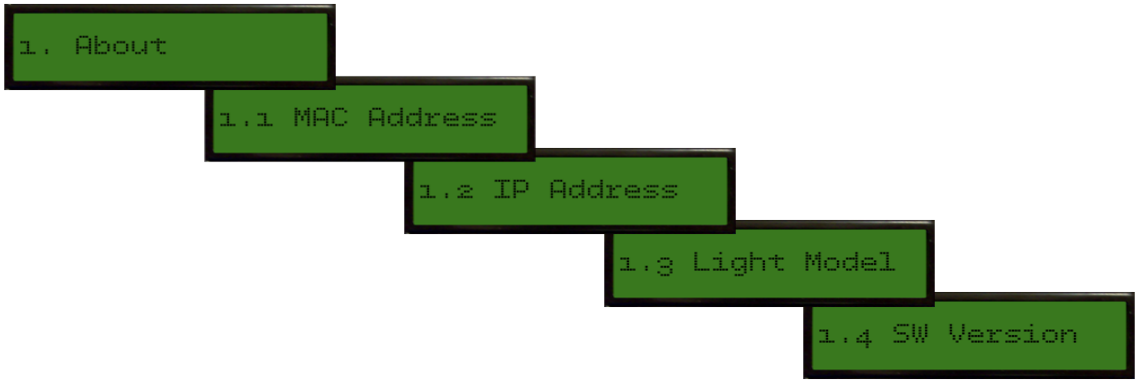
16.1.3 OK Button

The "**OK**" button enters and exits submenus.

1. About	1.1 MAC Address	1.2 IP Address	1.3 Light Model	1.4 SW Version
2. Diagnostics	2.1 Start	2.2 View Results		
3. Usage Stats	3.1 Left Light	3.2 Right Light	3.3 Reset Left	3. 4 Reset Right
4. Settings	4.1 OP WDT	4.2 OP WDT Stats	4.3 OP WDT Reset	

16.2 Category 1: About

In this chapter all of Category 1 menu items will be explained.



16.2.1 (1.1) MAC Address

Displays the MAC address of the Cabinet Card, according to the standard (IEEE 802) in six groups of two hexadecimal digits, separated by colons (‘:’), in transmission order, e.g. “01:23:45:67:89:ab”. One exception from the standard is made, the leftmost colon is missing, due to the 16 character limit of the LCD.

16.2.2 (1.2) IP Address

Displays the IPv4 address of the Cabinet Card, in four groups of one to three decimal digits, separated by dots (‘.’), e.g. “169.254.17.5”.

16.2.3 (1.3) Light Model

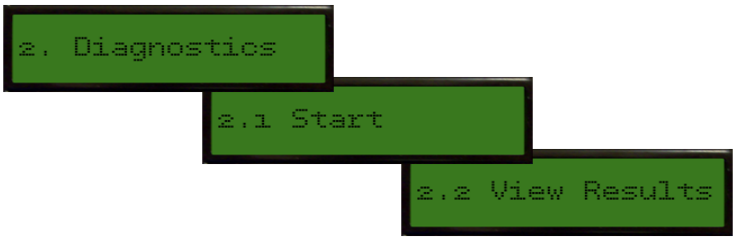
Displays the searchlight model that the Cabinet Card is configured to use, e.g. “Model: CL25-12”.

16.2.4 (1.4) SW Version

Displays the firmware version of the Cabinet Card, e.g. “0.1.2.3”.

16.3 Category 2: Diagnostics (support tool)

In this chapter all of Category 2 menu items will be explained.



16.3.1 (2.1) Start

Press the OK button to run the on-board diagnostic test suite to sense the electrical and mechanical condition of the searchlight. (contact Colorlight for help with this feature).

T1. Measurement of voltage and current when the searchlight is in “non operating mode”

T2 (HCW). Measurement of current drawn by the horizontal motor; motor rotates clockwise for 30 seconds.

T3 (HCCW). Measurement of current drawn by the horizontal motor; motor rotates counterclockwise for 30 seconds.

T4 (VCW). Measurement of current drawn by the vertical motor; motor rotates clockwise for 30 seconds.

T5 (VCCW). Measurement of current drawn by the vertical motor; motor rotates counterclockwise for 30 seconds and the value is temporary stored.

T6 /T7 (not valid for this model).

T8 (H MAG). Test of horizontal magnetic sensor; the horizontal motor is running at full speed for a predetermined time and number of triggers is recorded.

T9 (V MAG). Test of vertical magnetic sensor; the vertical motor is running at full speed for a predetermined time and number of triggers is recorded.

T10 (Lights). LED-module test; both lights should ignite and be lit for 30 seconds.
LED modules provide no feedback to to the Ebox and the test result for **T10** will always show "OK", therefore this light test must be visually verified to ensure that the LED modules light up.

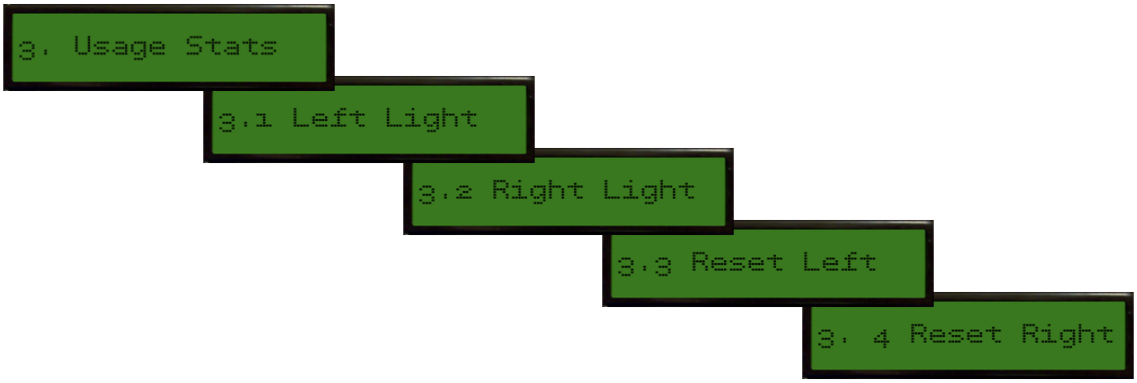
T11 (OP count). Counting the number of connected operator terminals in the network.

16.3.2 (2.2) View Results

Displays the result of the last run diagnostics test suite.
Use the “**Down**” button to cycle through the tests results.
Use the “**Right**” button to cycle through different test result information for the selected test.
Only applicable for test “T1” and test “T10”.

16.4 Category 3: Usage Stats

In this chapter all of Category 3 menu items will be explained.



16.4.1 (3.1) Left Light

Displays the usage of the left light source in hours:minutes:seconds, e.g. “Left: 1:23:45”.

16.4.2 (3.2) Right Light

Displays the usage of the right light source in hours:minutes:seconds, e.g. “Right: 1:23:45”.

16.4.3 (3.3) Reset Left

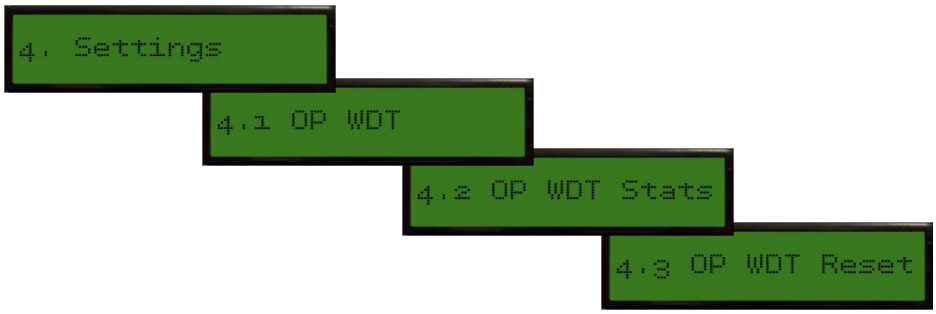
Resets the usage counter of the left light source.
A confirmation message, “**If sure press OK**”, is displayed upon entering the menu. Press the “**OK**” button at this point to reset the counter and exit the menu. Press the “**Down**” or “**Right**” button to exit the menu without resetting the counter.

16.4.4 (3.4) Reset Right

Resets the usage counter of the right light source.
A confirmation message, “**If sure press OK**”, is displayed upon entering the menu. Press the “**OK**” button at this point to reset the counter and exit the menu. Press the “**Down**” or “**Right**” button to exit the menu without resetting the counter.

16.5 Category 4: Settings

In this chapter all of Category 4 menu items will be explained.



16.5.1 (4.1) OP WDT

Ethernet communications guard OP WDT (Operator Panel Watchdog Timer)

This searchlight is built for use on long distances and the high-intensity light from the searchlight can, if set at a narrow beam, cause severe damage to surfaces closer than 1 meter. To avoid that the searchlight is forgotten with the light on, always use the feature “off and park” when not using the searchlight.
If however a hardware failure occurs that breaks the Ethernet communication between the box and operator panel, a safety function will step in and automatically turn off the light within 3 seconds, the OP WDT will also interrupt an ongoing sweep or surveillance activity.

If an OP WDT event has occurred an error message will be displayed in the electrical box and the alarm relay (CL25/35) will trigger. When communication returns the message will disappear and the alarm will be reset.

For multiple panel systems: OP WDT will step in only when communication is lost to all panels.

Possible reasons why OP WDT turn off the lights:

- The power supply to the operator panel is broken.
- The power supply to the Ethernet switch (if any) is broken.
- Broken Ethernet cable between electrical box/ Ethernet switch (if any) and operator panel.

OP WDT is disabled by default, to enable press “**OK**” button in menu “4.1 OP WDT” screen and press the “**Down**” or “**Right**” button to toggle the function on/off.

16.5.2 **(4.2) OP WDT Stats**

Displays a counter that keeps track of the number of times the Ethernet communication has recovered from an OP WDT event.
In case of suspected cable problems with connected operator panels, this counter can be helpful when troubleshooting.

16.5.3 **(4.3) OP WDT Reset**

Resets the OP WDT counter.
A confirmation message, “**If sure press OK**”, is displayed upon entering the menu. Press the “**OK**” button at this point to reset the counter and exit the menu. Press the “**Down**” or “**Right**” button to exit the menu without resetting the counter.

17. TECHNICAL DATA

17.1 Specifications CLITE2

MODEL RANGE

TYPE	MODEL	SOURCE
CL-2 (low) platform	CLITE 2	LED-module developed by Luminell for Colorlight

PERFORMANCE

LED LIGHT UNIT	CLITE LED module
Technology	LED
Light source	2 x 250W
Color Temp	6300 K
Color rendering index	70 (minimum)
Light intensity	2,4 M candela
Range	1500m (1 lux)
Beam width	5,7°

MECHANICAL	
Technology	Slipring. Brushless digital controlled servo motors
Horizontal movement	Unlimited movement
Vertical movement	Unlimited movement
Speed both axis	Stepless 0-33 deg/sec

FUNCTIONS

STANDARD DIRECT CONTROLLED	STANDARD FUNCTIONS	STANDARD PACK 1	OPTIONAL PACK 2	OPTIONAL PACK 3
Light on/off	System activation	Position indicator	Auto sweeping	Synchronized control
Dimlevel 75%, 50%, 25%	Parking mode	Language version	Fixed positions	
Rotation speed, stepless	User settings		Surveillance	
	System information			
	Single lamp mode			

OPTIONAL HARDWARE		
Wireless radio control	Fiber optic control cable	
Thermal camera unit (not for retrofitting)	Customized color	
Daylight camera unit (not for retrofitting)	Wet paint (AWL grip or similar)	
Extra remote panel (s)		
External power supply for panel (s)		
Ethernet switch, 5 port and 8 port		
Upside-down installation		

TECHNICAL DATA

Power consumption	650W (max load) (EBOX 24VDC) 850W (max load) EBOX 100-240VAC)
Heat load	-
LED-module	305x180 mm (x2)
LED life	Up to 100 000 hours

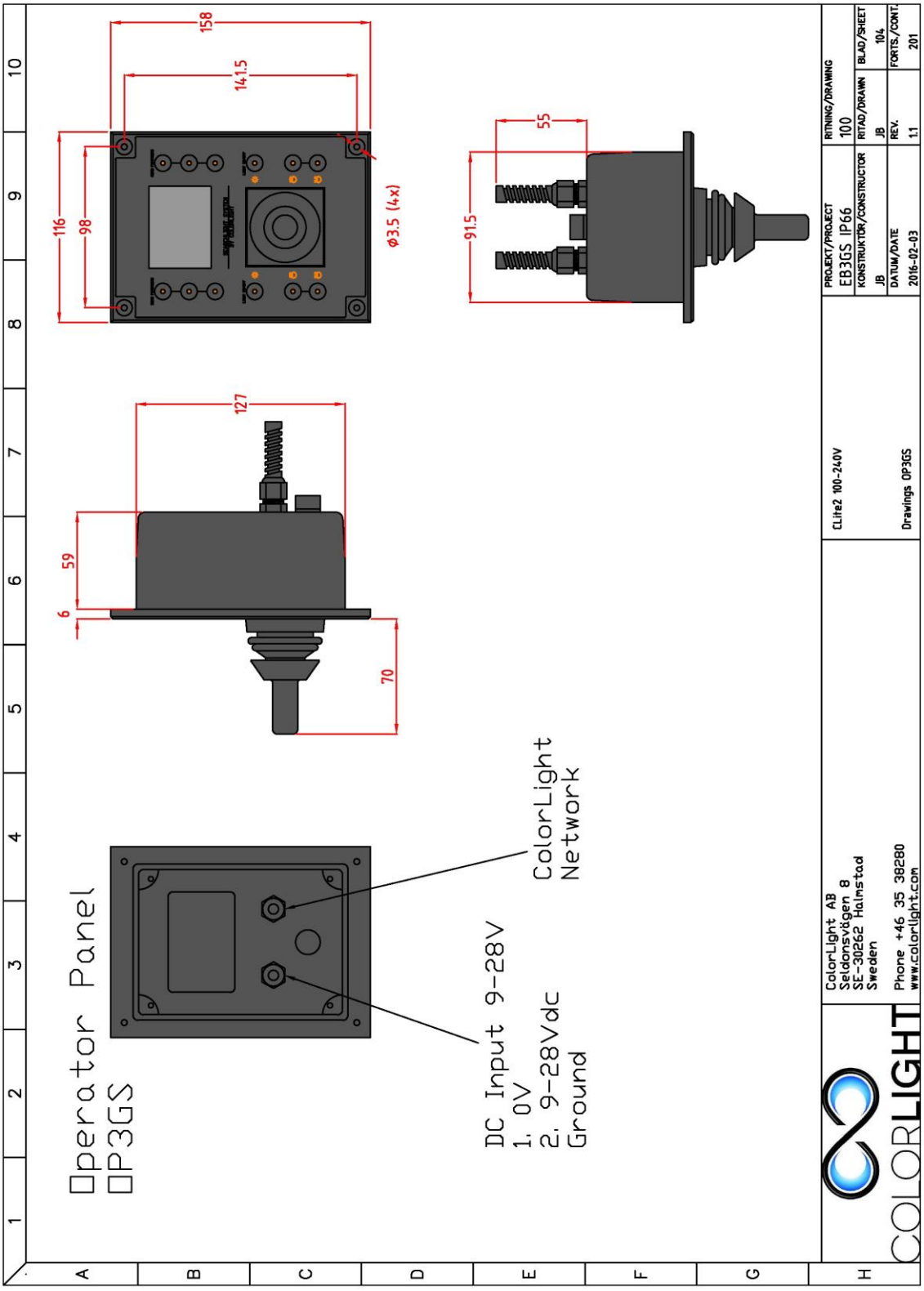
Ballast	No external ballast
Signal cable	4x2x1 shielded, twisted pair
Power cable	5G4 shielded
OP3G cable	Ethernet CAT5-FTP *Fiber available for long distance*
Serial cable	RS485/RS232 *Optional. ICD for external control*

	SEARCHLIGHT BODY	EBOX DC	EBOX AC	OPERATOR PANEL
Weight (kg)	28	6	11	0,5
Static size (cm)	26x57x50 cm *****	30x25x15 cm *****	30x34x15 cm *	13x9x6 cm *****
Material	Acid proof stainless steel 1.4401. Led module in seawater resistant powder coated aluminium.	Coated steel	Coated steel	Anodized aluminum / ABS
Paint	Powder coat white RAL 9016	Powder coat grey RAL 7035	Powder coat grey RAL 7035	Anodized black
IP-Class	IP66	IP22	IP22	IP56
Operating temp	-40º / +55º Celsius	+5º / +45º Celsius	+5º / +45º Celsius	-20º / +55º Celsius
Input power	Powered from ebox	24VDC	100-240VAC 50-60Hz	9-28 VDC (max 200 mA @ 24V)

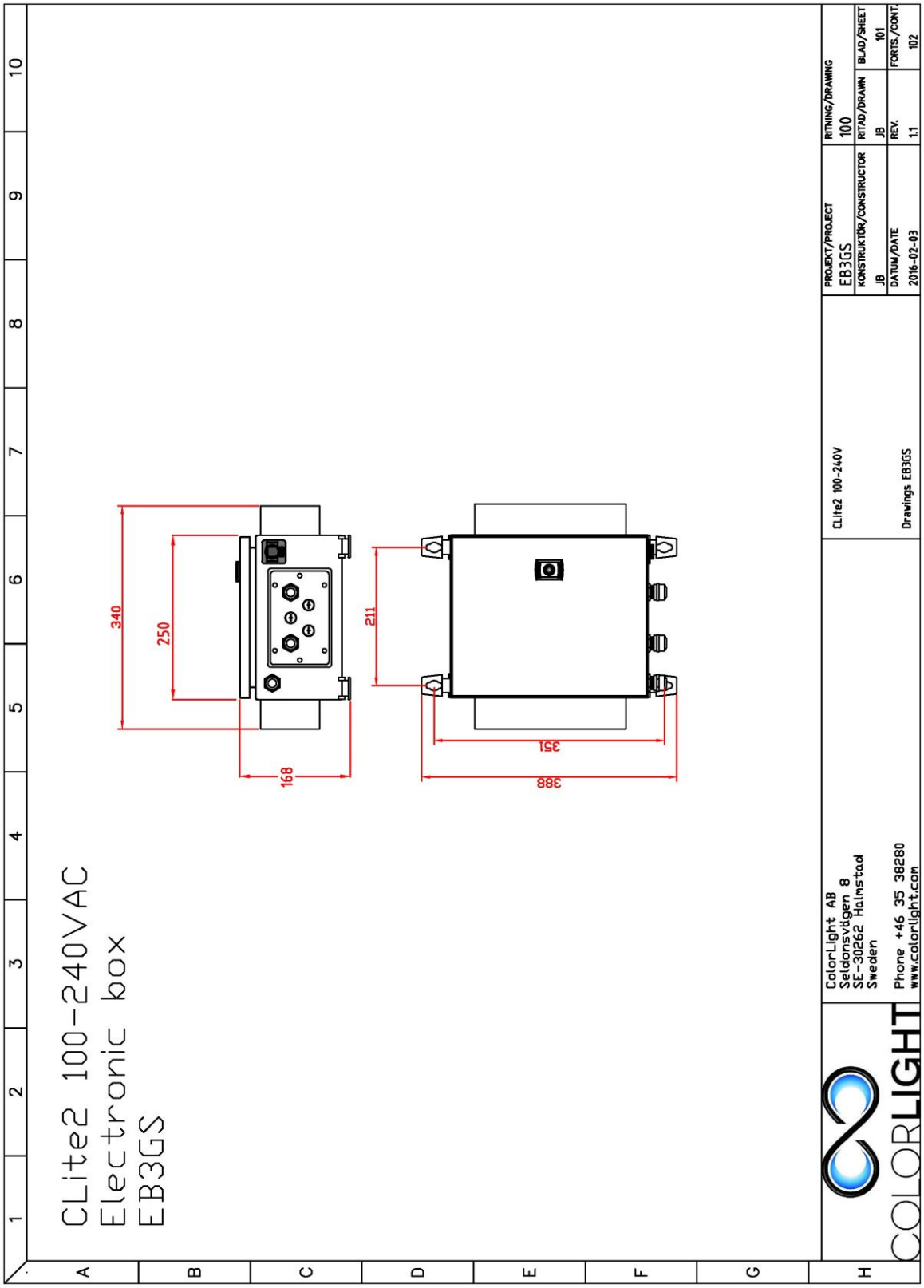
*** see drawings for detailed info**

17.2 **Mechanical drawings**

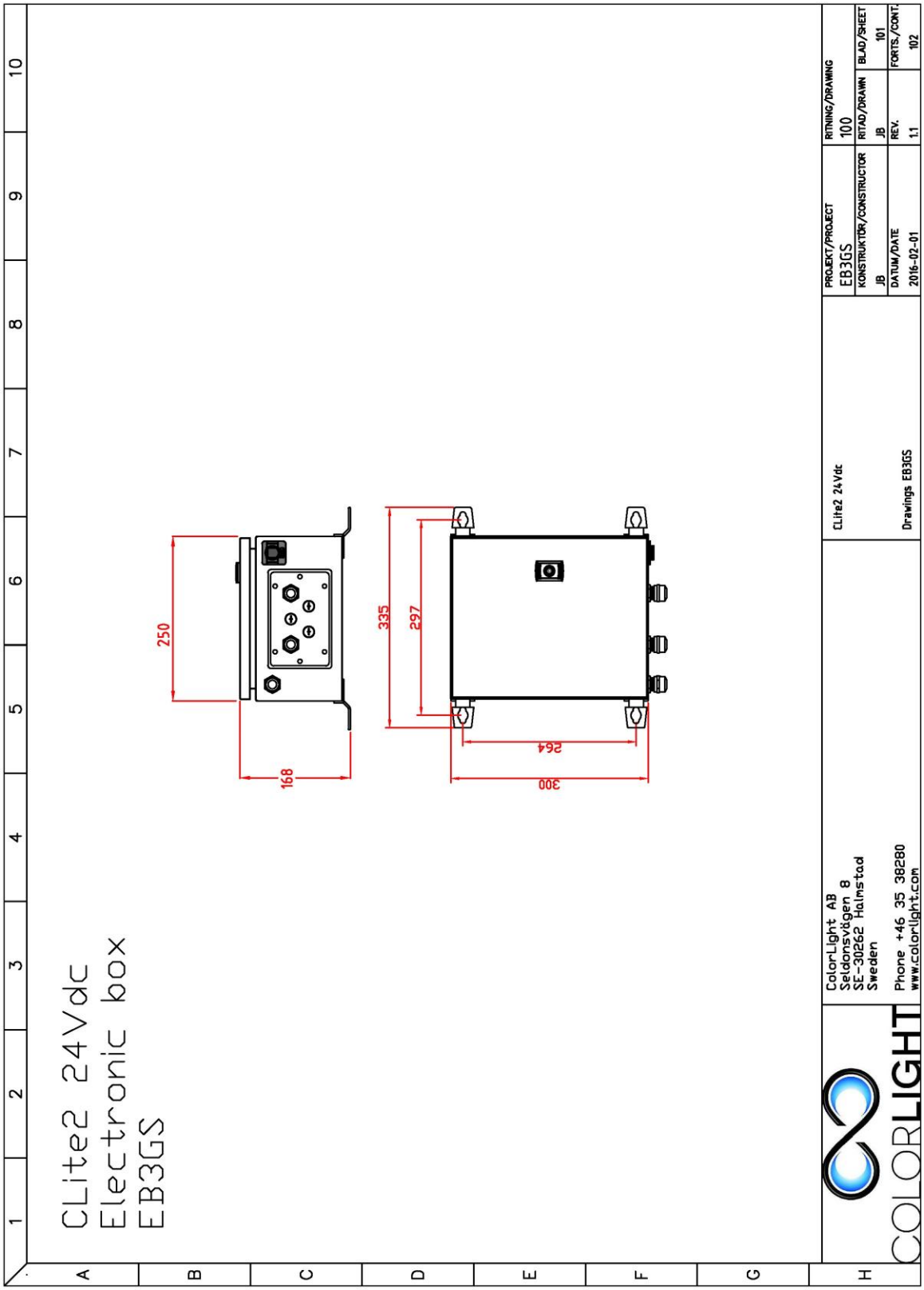
17.2.1 **Operator Panel**



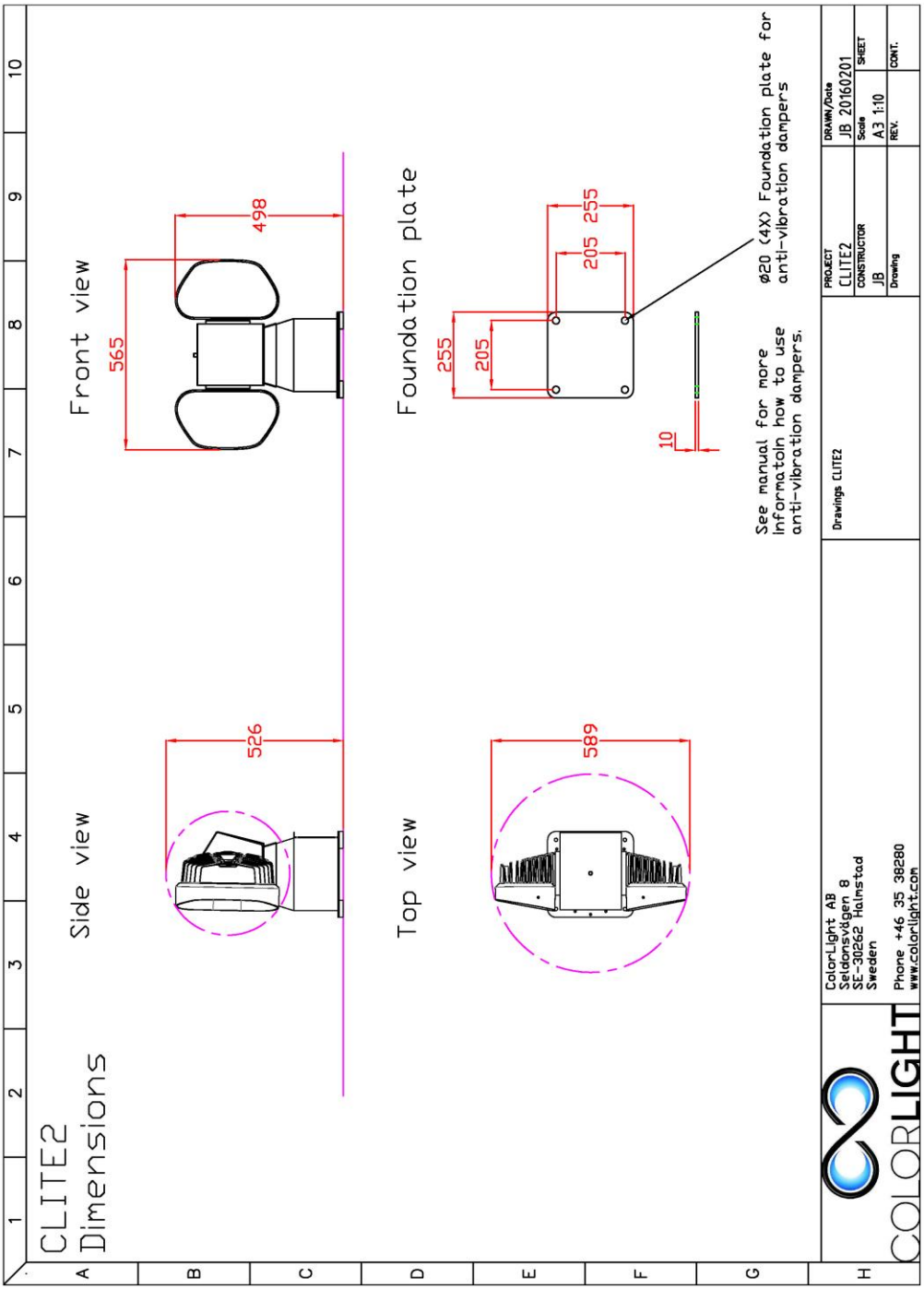
17.2.2 **Electrical box CLITE2, 100-240VAC**



17.2.3 **Electrical box CLITE2, 24VDC**

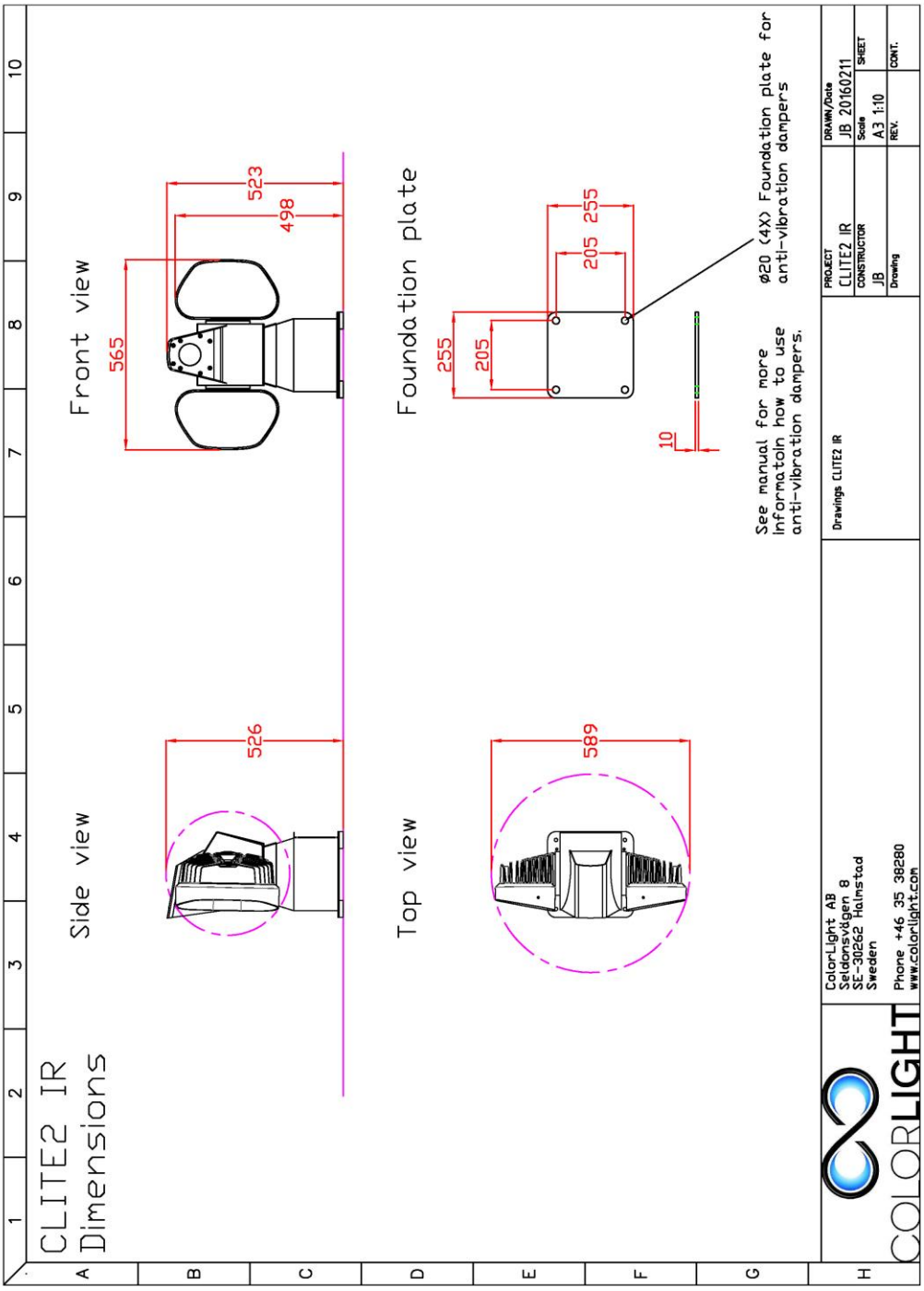


17.2.4 **Searchlight CLITE2 (standard)**



The searchlights cable glands are rated IP68 but for extra protection during heavy weather situations it's still recommendable to install the searchlight so the cable exits are facing the stern.

17.2.5 **Searchlight CLITE2 IR (with camera)**



The searchlights cable glands are rated IP68 but for extra protection during heavy weather situations it's still recommendable to install the searchlight so the cable exits are facing the stern.

18. CLITE2 SEARCHLIGT WITH THERMAL CAMERA

18.1 Introduction

Dear Customer.
Thank you for choosing a searchlight from Colorlight.
Our products are built by hand and the components are chosen with a focus on performance and quality.
We hope that you will be totally satisfied with your searchlight.

CL*IR*: Colorlight searchlight with integrated Infra-red thermal camera.
The thermal night vision camera unit from FLIR® is placed in a robust, modern designed housing mounted on top of the searchlight middle part; this means that the camera always follows the searchlights horizontal movement from the joystick.
The thermal camera is mounted in a special tilt unit witch make it easy to adjust the camera vertically from the operator panel.

The front is provided with a germanium window with an integrated temperature-controlled and self-regulating heating element, the element will prevent condensation and ice build-up on the front window that would otherwise disrupt the cameras line of sight.
The infrared thermal camera provides a clear picture based on temperature differences, even in total darkness. This is possible since the camera is sensitive to thermal infrared radiation.

By design, the camera image will freeze momentarily on a periodic basis, this can also be heard as quiet clicking noise from the camera housing.
A shutter activates inside the camera and provides a target of uniform temperature, allowing the camera to correct for ambient temperature changes and provide the best possible image.

General technical description of infrared imaging
All objects with a temperature over the absolute zero point -273 C (0 degree K) generates infrared radiation. The hotter the temperature, the more infrared radiation.
The IR sensor also sense differences of the materials emissivity, reflection and transmission. Emissivity – the materials capability to emit infrared radiation. Reflection – the material capability to reflect infrared radiation. Transmission – the material capability of transmitting infrared radiation.

To keep it very simple
Materials with a temperature over -273 C will be detected by the thermal sensor and different materials with same temperature will appear different on the monitor due to the different properties in the materials.

Weak point with thermal sensor
Rain, fog, snow reduces the optical sight and it also effect the range of IR detection. Depending distance, size of object and level of temperature (IR radiation) there is no simple answer how much the detection range is affected – but it is affected.
A combined solution with thermal sensor and visible light will support your improved visibility depending the actual conditions during your operations.

18.2 Specifications

Thermal unit

Camera core type	FLIR (uncooled longwave thermal imager)	
Lens	25mm*1	
Field of view	13x10 degrees	
Video output	Analog Channel Composite Video (Male RCA connector) PAL (Standard), NTSC. To change the video standard, see section 20.SET CAM VIDEO STANDARD	
Camera type	FLIR Tau 2, 336 (standard)	FLIR Tau 2, 640 (optional)
Detector resolution	336x256, 17µm	640 × 512, 17µm
Video resolution	640 × 480 (NTSC); 640 × 512 (PAL)*2	
Refresh rate	25 Hz (PAL), 30 Hz (NTSC)	
Detection man/vessel	800m / 2000m	
Recognition man/vessel	200m / 550m	
Identification man/vessel	100m / 300m	

*1 *Other lens types available upon request*

*2 *Tau 336 & 324 analog video is upsampled & interpolated to 640 × 480 for NTSC, and to 640 × 512 for PAL*

Mechanical

Technology	Menu controlled tilt function
Horizontal movement	Unlimited movement together with searchlight
Vertical movement	+/- 20 degrees
Speed horizontal movement	See information on each searchlight model

Functions, menu controlled from panel

Camera power	On/Off
Tilt function	Up/Down with graphical indicator
Focus	X2 X4
Color palettes	White Hot Black Hot Fusion Rainbow Glowbow Ironbow 1 Ironbow 2 Sepia Color 1 Color 2 Ice Fire Rain

Technical data

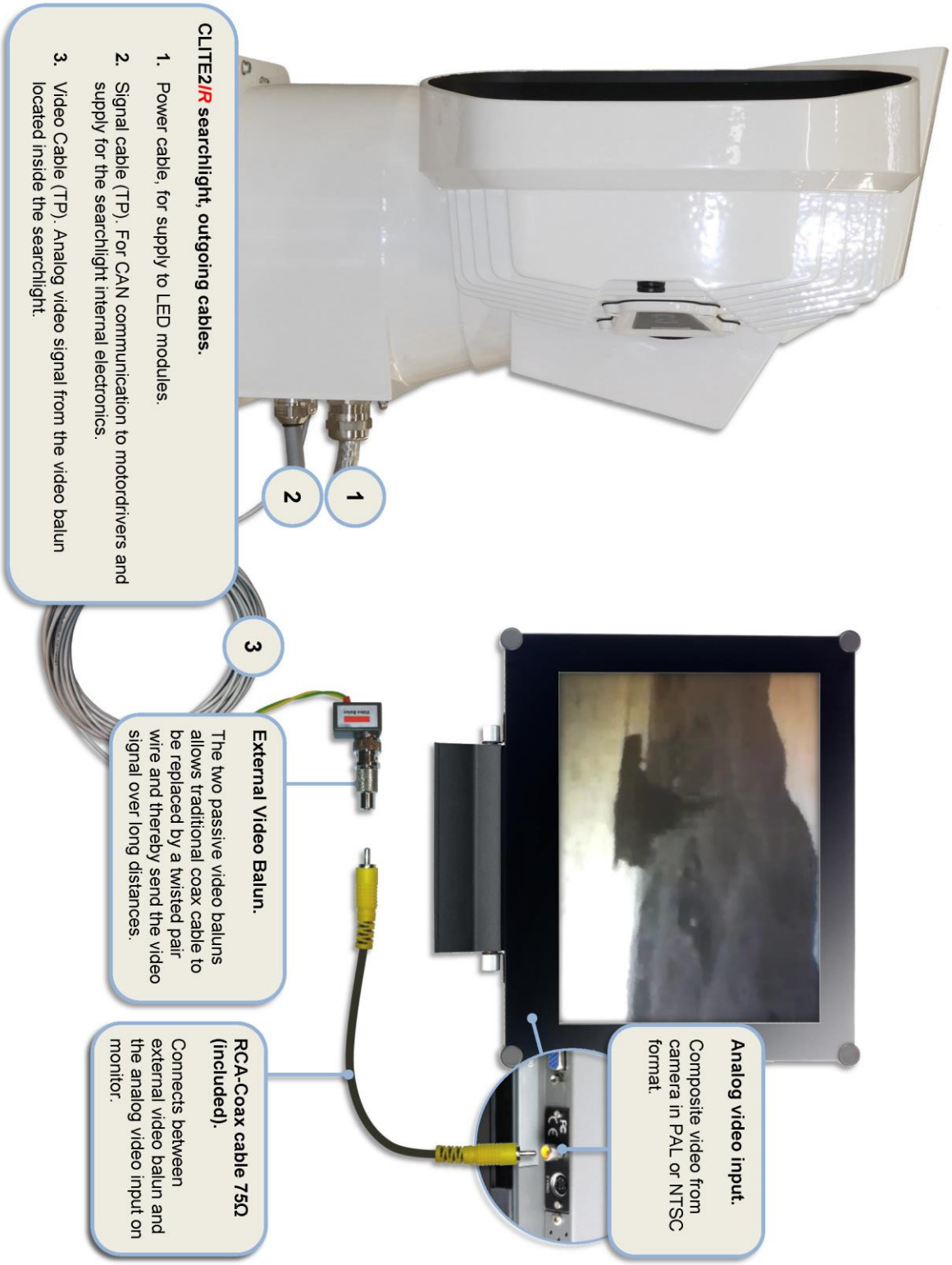
Weight (additional on searchlight)	2,1 kg
Static size thermal module	15x15x20 cm
Material housing	Acid proof stainless steel 1.4401
Paint housing	Powder coat white RAL9016 as standard
Frontwindow material	Germanium
Frontwindow heater/ Deicer Rated Power Supply Switch-on temperature	Etched Polyimide foil heater with temperature controller ~10W 24Vdc supplied from electric box +12C or bellow

Ambient conditions Camera housing

Enclosure rating of the housing	IP66
Operating temperature	-40°C to +70°C
Storage temperature	-50°C to +85°C
Thermal Shock	No damage or permanent degradation after extreme thermal shock from one extreme of the operating temperature range to the other.
Mechanical Shock	No damage or permanent degradation after exposure to shock pulses of 250 g (1.5msec half-sine) and 500g (0.8msec halfsine) along any axis.
Vibration	Meets all requirements of this specification and exhibits no damage or permanent degradation after exposure to random vibration along any axis up to 4.3 grms per the profile specified below.
Altitude	Meets all requirements of this specification and exhibits no damage or permanent degradation after exposure to pressure equivalent to 12 km above sea level.

Frequency (Hz)	Acceleration Density (G2/Hz)
10	0.040
20	0.100
100	0.100
800	0.002
1000	0.002

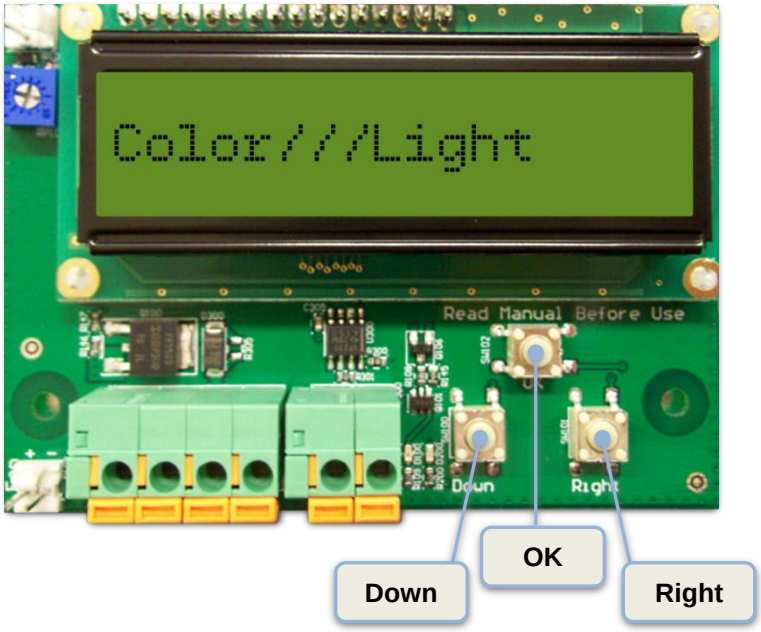
19. CLITE2*IR* - *VIDEO* CONNECTION



20. SET CAM VIDEO STANDARD

This chapter describes how to configure the cabinet control-system to change the video format during camera startup.
The video standard is NTSC for the United States, Canada, Mexico, Asia and South America. PAL is used primarily in Europe.
The unit is usually configured with video output set as PAL as standard setting.
Change of video standard requires that you enter the system's “Factory setup”-menu.

Note: navigation in “Factory setup”-menu should be done with extreme caution as incorrect settings can change the searchlight behavior and make features unusable.



20.1 Menu navigation

The user interacts with the menu system using the three buttons, the “**Down**” button, the “**Right**” button and the “**OK**” button.

20.1.1 Down Button

The main function of the “**Down**” button is to shift between the menu categories. It also has two alternate generic functions.
1. While in submenus listing items of various types the “**Down**” button scrolls down in the list.
2. While entering a value of some sort, the “**Down**” button decrements that value.

20.1.2 Right Button

The main function of the “**Right**” button is to shift between the submenus of the selected menu category. It also has two alternate generic functions.
1. While in submenus listing items of various types the “**Right**” button scrolls up in the list.
2. While entering a value of some sort, the “**Right**” button increments that value.

20.1.3 OK Button

The “**OK**” button enters and exits submenus.

20.2 Factory setup, how to change between PAL and NTSC.

In the systems hidden installation menu, named "Factory setup" it is possible to choose between the two different video standards. Your monitor may be compatible with only NTSC or only PAL or both. See your product manual for detailed info.
Follow these steps to boot the system in “Factory Setup”-mode.

1. If the system is powered up, turn it off by turning the main switch to "**0**".

2. Press all three buttons on cabinet card while turning the main switch to "**1**", keep pressing until the text "**Factory Setup**" appears on the display.

3. Repeatedly press the “**Right**” button until the submenu "**0.9 Set Camera**" appears in the display. Press the “**OK**” button to enter this menu.

4. With the “**Right**” button you can step through the following settings:

- **Camera Off**: disables the possibilities to control the camera from the operator panel, **do not select this if you have a CLIR unit.**
- **Camera PAL**: Sets video output to PAL (25Hz) when cam is activated.
- **Camera NTSC**: Sets video output to NTSC (30Hz) when cam is activated.

When preferred setting is displayed, Press “**OK**” to save, submenu "**0.9 Set Camera**" is shown.

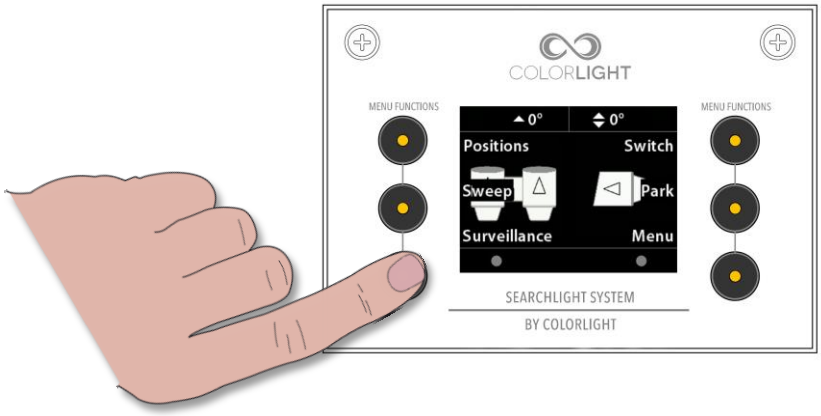
5. Now press the “**Down**” button once, menu "**1. About**" appears in the display.
6. Setup complete, recycle power on main switch.

21. USING THE THERMAL CAMERA IN CAM MODE

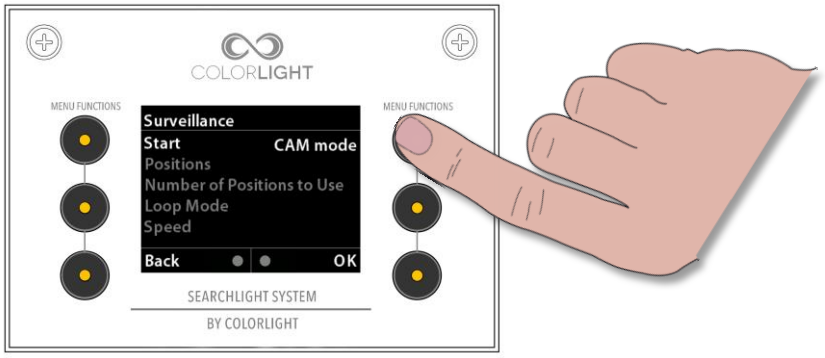
21.1 Activate the thermal camera

Note:

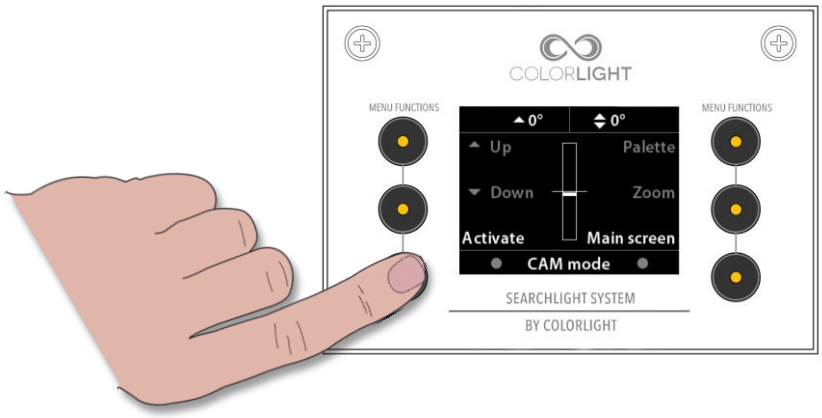
- Make sure your monitor is powered on before activating the camera.
- Activation takes a few seconds, don't press any cam-buttons until the image is visible in the monitor.
- During each camera-activation, configuration data is sent to the camera and the image will flash for a second and then become stable, this is a completely normal start-up phase for the camera.
- Changes in CAM mode takes effect immediately and does not require confirmation.
- Camera settings can only be accessed if camera is activated.
- Activation must be done from the CAM-mode screen.
- Activated camera is indicated by the letter "**C**" in the bottom left of the display.



To activate the camera, first select "**Surveillance**" from the quick start menu.



In "Surveillance" submenu, select **"CAM mode**".



By pressing "**Activate**" the thermal camera is powered up and the video signal is sent to the monitor. All camera settings will change from grey to white text and be selectable, see description below. A second press on the same button turns the camera off.

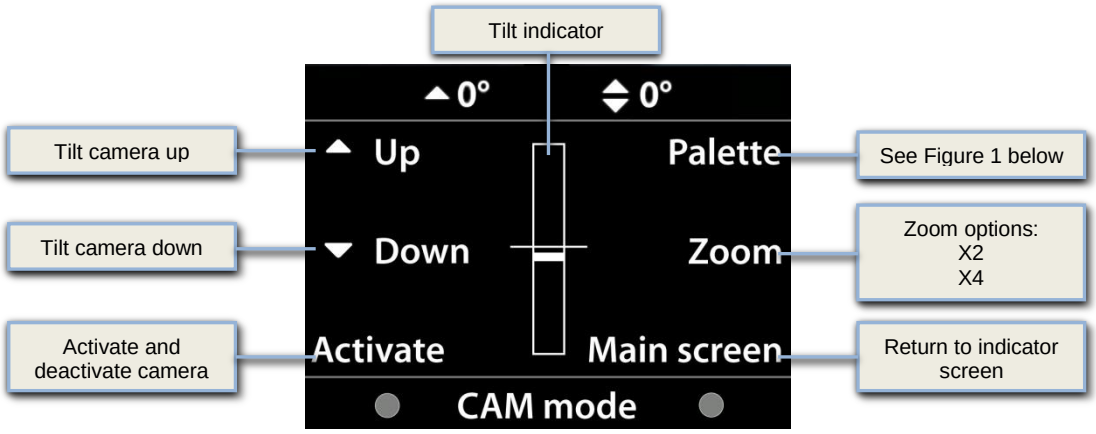
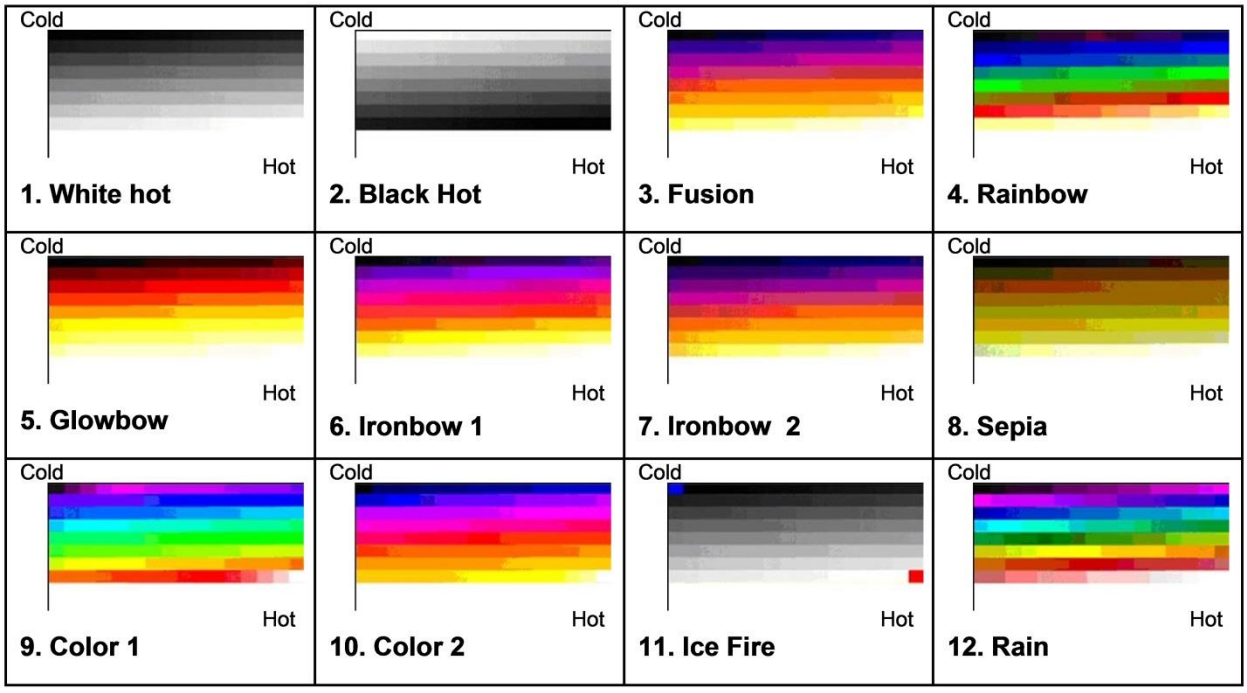


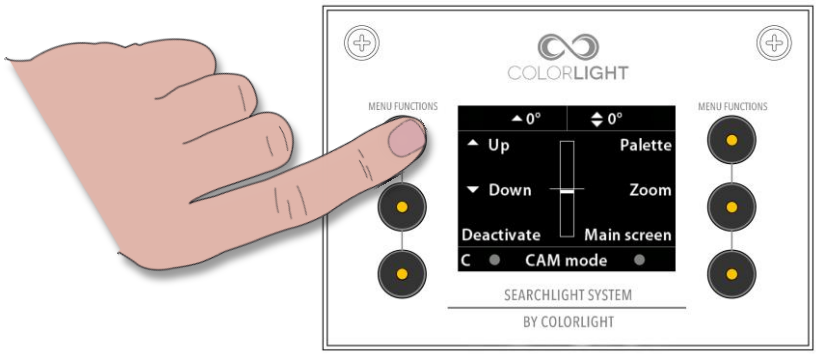
Figure 1 Palette. (Image source FLIR®)



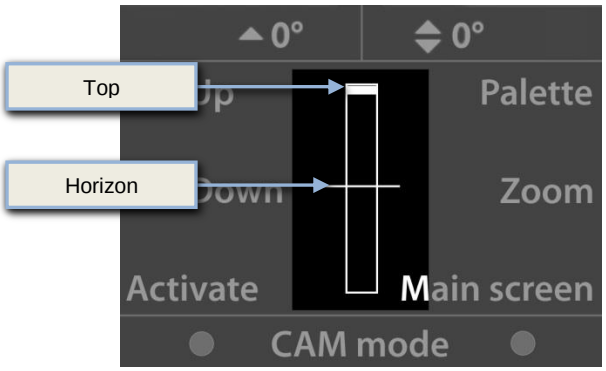
21.2 **Camera tilt**

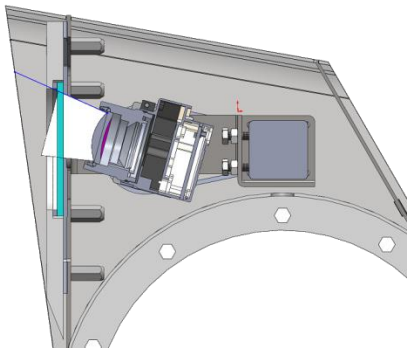
The camera tilt angle is adjustable + / - 20 degrees by the mechanical mounting in a software-controlled tilting unit.

21.2.1 **Tilt up**



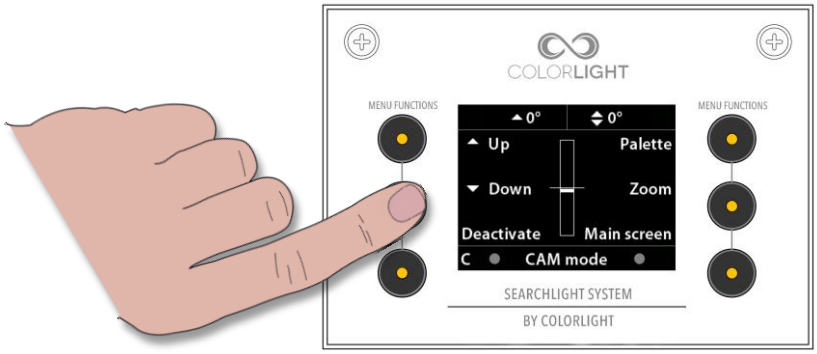
In “**CAM mode**”, press **"Up**”-button repeatedly to adjust the camera view angle upwards.



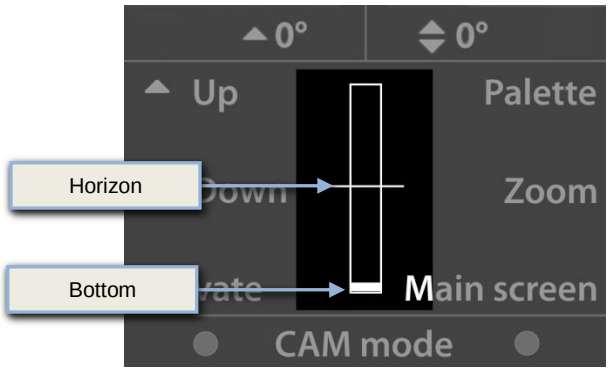


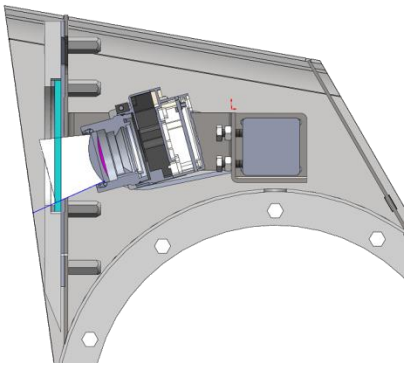
The camera will tilt upward in steps until the end position is reached, the tilt indicator will follow the camera movement.
Press the button repeatedly until the preferred tilt angle is found, the setting is saved as default and in the event of power failure, the camera will go directly to this position.

21.2.2 **Tilt down**



In “**CAM mode**”, press "**Down**”-button repeatedly to adjust the camera tilt angle downwards.





The camera will tilt downwards in steps until the end position is reached, the tilt indicator will follow the camera movement.
Press the button repeatedly until the preferred tilt angle is found, the setting is saved as default and in the event of power failure, the camera will go directly to this position.

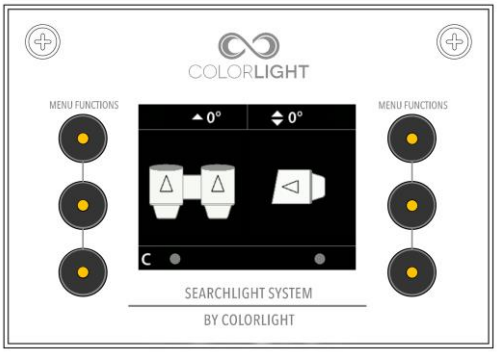
21.3 **Spot meter**

In the center of the screen, an onscreen pixel area acts as a tool for measuring temperatures.

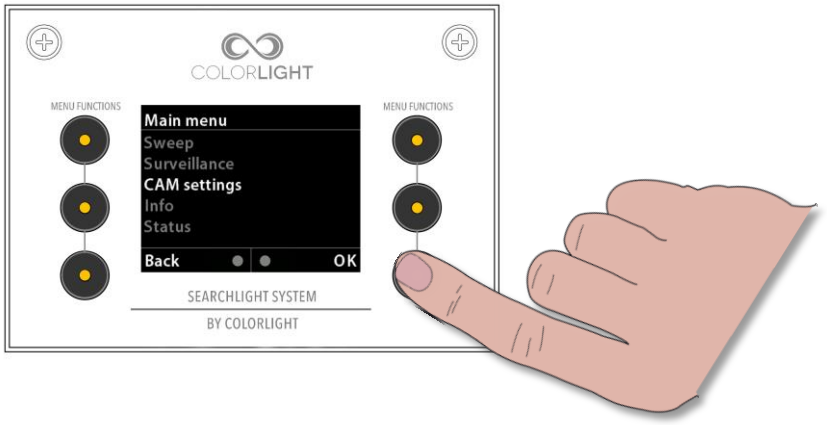
Center this area over an object to measure; the temperature is displayed in the lower left corner of the screen.

22. MENU - CAM SETTINGS

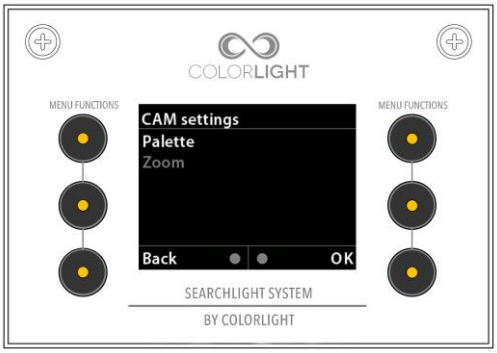
The camera settings “**Zoom**” and “**Palette**” can be accessed in two ways; either you set them directly from **CAM mode**-screen described in chapter *21* or by selecting “**CAM settings**” in the main menu.



The basic camera settings can only be accessed if the camera is activated. Activated camera is indicated by the letter “**C”** in bottom left of the display.
If the menu rows are dimmed the camera must first be activated before changes can be made please see *21.1 Activate the thermal camera.*



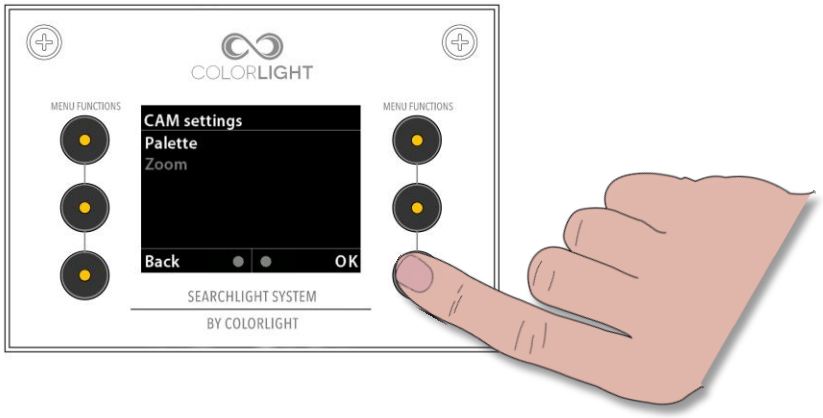
Navigate down to “**CAM settings**” and press “**OK**”.



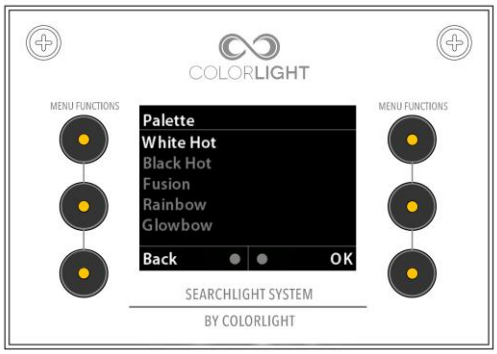
Basic camera settings.

22.1 **Palette**

The camera settings “**Zoom**” and “**Palette**” can be accessed in two ways, either you can set them by selecting “**Cam settings**” in the main menu or you can use the “**CAM mode**” which is an active cam screen where all our camera functions can be easily accessed and where the changes requires no confirmation.



In “**CAM settings**”-menu, navigate to palette and press “**OK**”.



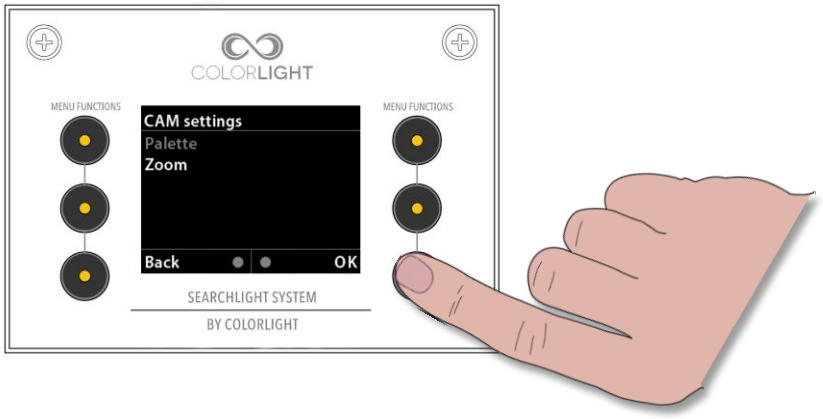
Unlike settings in CAM mode, one can in this menu see what color palette that is selected. Change the setting by moving the joystick up or down in the list until the requested palette is shown. For evaluation, all changes take effect immediately on the monitor.

Press “**OK**” to save the new setting or “**Back**” to return to previous selected palette.

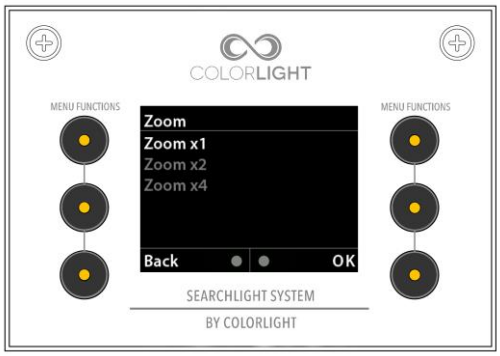
The following color palettes are available (also see Figure1: Palette):

1. White Hot	**7. Ironbow 2**
2. Black Hot	**8. Sepia**
3. Fusion	**9. Color 1**
4. Rainbow	**10. Color 2**
5. Glowbow	**11. Ice Fire**
6. Ironbow 1	**12. Rain**

22.2 **Zoom**



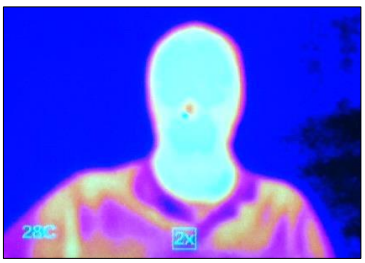
In “**CAM settings**”-menu, navigate to “**Zoom**” and press “**OK**”.



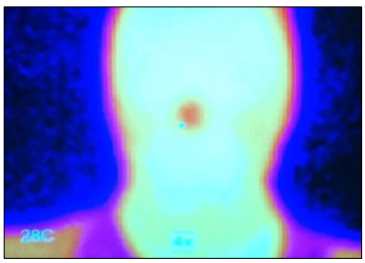
Change the image magnification by moving the joystick up or down in the list until the requested zoom setting is shown. For evaluation, all changes take effect immediately on the monitor. Press “**OK**” to save the new setting or “**Back**” to return to previous selected zoom level.

X1 – Normal mode, no magnification.
X2 - Causes the thermal camera to digitally zoom in to x2 magnification.
X4 - Causes the thermal camera to digitally zoom in to x4 magnification.

X1



X2



X4

23. SUPPORT

If you have questions about the searchlight and its features, please contact Colorlight technical support worldwide, see www.colorlight.com for contact details.

Or contact Colorlight head office:

Color Light AB
Engineering-ColorLight
service@colorlight.com
Phone: +46 353 8270

Need technical Support?
Follow the link below and fill out the form, we will contact you shortly.
http://www.colorlight.com/tech-support/service-request.html

If you want to upgrade your system with additional options as described in this document, section (15.8.5.7), please contact:

Color Light AB
Phone: +46 35 38280
Fax: +46 35 38279
www.colorlight.com
sales@colorlight.com

Delivery address:

Color Light AB
Seldonsvägen 8
SE-302 62 Halmstad
Sweden

Notes:

COLORLIGHT

We look forward to serve you with the Future Searchlight Solution - wherever you are

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