



LOPOLIGHT CONTROL HUB

INSTALLATION MANUAL



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2 Introduction

The Lopolight Control Hub is a unit that will enable control of electrical equipment, using existing MFD [Multi Function Display] or dedicated web browser as user interface. It is especially suitable for control and monitoring of navigation lights and other critical functions on board.

3 Important information

3.1 Disclaimer

Lopolight does **not** warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Lopolight. Lopolight is not responsible for damages or injuries caused by your use of or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

3.2 RF exposure

This equipment complies with FCC / ISED RF exposure limits for general population / uncontrolled exposure. This equipment should be installed and operated with a minimum distance of 1m (3ft) between the compass and the Control Hub. This unit must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.

3.3 Declaration of Conformity CE approval

Lopolight declares that this product is in compliance with the EMC Directive 2014/53/EU.

3.4 Product Disposal

Dispose of this product in accordance with the WEEE Directive. The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment which contains materials,

components and substances that may be hazardous and present a risk to human health and the environment when WEEE is not handled correctly.

3.5 Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Lopolight cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Lopolight cannot accept liability for any differences between the product and this document.

3.6 Warranty

Lopolight offer 2-year warranty from production date, or by purchase receipt documentation. For warranty claim please register your unit via our web portal, and required documentation needs to be uploaded for verification – link to warranty form:

<https://www.lopolight.com/support/warranty/warranty-claim>

This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.

3.7 Aftersales support

Latest manuals, FAQ and support videos can be found at link:

<https://www.lopolight.com/solutions/lopolight-control-hub>

4 Installation

The Lopolight Control Hub is designed to be installed by a skilled marine electrician, that shall be able of understanding the importance of information described in this manual.

4.1 What is in the box

You will find the Lopolight Control Hub hardware (part no. 500-001), quick-guide, wiring schematic diagram and connection layout sticker (which is to be applied after filling in the connection light/item for each channel).

4.2 Location of Control Hub

When selecting the Control Hub location, you need to consider below factors:

4.2.1 Manual override for emergency usage

The cabinet needs to be located accessible, to be able to control the manual override switches.

4.2.2 Water ingress

The location needs to be in a dry area to avoid water ingress.

4.2.3 Ventilated location

The chosen location needs to be in a well-ventilated area, to avoid unnecessary overheating.

4.2.4 Power supply

Power input to the unit shall be 12-24VDC (10-32VDC), and the positive supply wire shall be of “a reasonable dimension”, scaled to carry the theoretical maximum load of all connected equipment. The size of the main fuse shall also be considered.

Guideline: 1.5-2 mm². Maximum length from DC distributor rail: ~1 meter / 3 feet.

4.2.5 Ethernet connection

Use CAT5 or higher quality rated ethernet cable. Or use original Raymarine Raynet or Garmin Marine Network ethernet cables.

4.3 EMC Guidelines

In areas of extreme EMC interference, interference may be noticed on the product. Where this occurs the product or the source of the interference should be relocated.

4.4 Compass interference

In case you experience compass interference, the Control Hub needs to be relocated at least 1 meter (3 feet) away from the compass.

4.5 Compatible MFD's (Multifunction Displays)

An updated model list of compatible MFD's, which is integrable with the Lopolight Control Hub system, can be found on the Lopolight website <https://www.lopolight.com/solutions/lopolight-control-hub>

Below are the current products models list available:

Garmin – GPS MAP series with latest software version (see Garmin support site for information).

Raymarine - Axiom series with Lighthouse 4 software version LH4.7.172 or newer version.

Furuno – TZTXL series with latest software version (see Garmin support site for information).

4.6 Connect Ethernet to MFD

The Control Hub is delivered without Ethernet cable, the Control Hub has an RJ45 Ethernet connection. For Raymarine MFD's a Raynet to RJ45 cable is required. For Garmin MFD's a Marine Network Cable or Connector Kit required (see information below).

MFD brand	Cable	Description	Part no.
Raymarine	Raynet to RJ45	Standard Raymarine part	A62360 (1m/3ft) A80151 (3m/10ft) A80159 (10m/30ft)
Garmin	Marine Network Cable	Standard Garmin part	010-10550-00 (1,8m/6ft) 010-10551-00 (6m/20ft) 010-10552-00 (12m/40ft) 010-11169-00 (15m/50ft)
Garmin	Cat5 Ethernet with RJ45 in both ends	Standard at Cat5 cable with Garmin connector kit	010-10603-00
Furuno	TZTouchXL LAN Cable assy WP RJ45 to NON-WP RJ45	Standard Furuno part	001-646-960-00 (2m/6ft) 001-646-980-00 (5m/16ft) 001-647-000-00 (10m/33ft)

4.7 Compatible navigation lights

The Control Hub is designed for Lopolight navigation lights and is designed to monitor the advanced start-up selftest and lifetime monitoring function.

Other LED lights can be controlled, provided they have a power consumption of less than 2A per light channel and a maximum of 10A for the total system power consumption. Should power consumption exceed 2A, a work relay must be fitted to avoid overload. See wiring schematic diagram supplied with control hub or use

<https://www.lopolight.com/solutions/lopolight-control-hub>

to obtain information.

The power cable (not supplied) must be connected to a 12 or 24VDC system and protected by a general main fuse protection 10A (S) is to be fitted. The Control Hub is set up for 24VDC as standard. See chapter 5.14.1 for setting up Power configuration.

NOTE: The chosen supply voltage is also the output voltage supplied to the connected equipment.

4.8 Power output connections (lights/AUX items)

The Control Hub has 16 monitored channels, which can be used for Lopolight navigation lights, as well as other brands of LED lights and Auxiliary items (cockpit light, courtesy light, and other electrical equipment). Settings for each channel will be required, as monitoring of Lopolight lights and other items are different. See included wiring schematic diagrams chapter 6 and 7 for more information on how to connect items.

4.9 Termination of connection wires

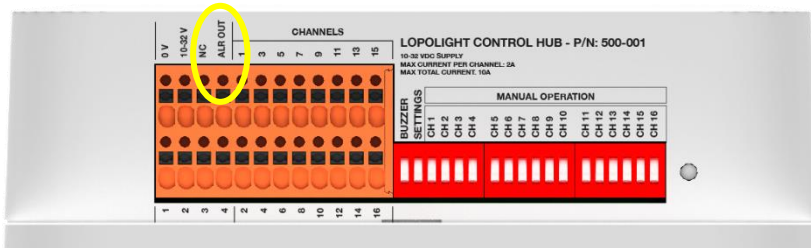
The use of strand-protection ferrules is recommended when terminating wires in the Control Hub.

4.9.1 Cable size recommendation

The basic recommended standard wire gauge is 1 mm² (17AWG) for max. 2A output, but can and shall be optimized to suit the individual

Alarm buzzer output

As an addition to the internal alarm buzzer, an external alarm can be connected (marked in yellow circle). It may be used to activate an audible/visual alarm, located in a different location, away from the Control Hub. Maximum load: 200mA. (use a driver relay if larger load is expected. Make sure relay coil consumption does not exceed the 200mA maximum. The output is 3.3 VDC, high-going.
(Refer to wiring schematic example for further examples) (Fig.M).



PWM dimming control (200Hz)

Channel number 1 and 14 can be set-up for PWM dimming purposes. If not used for PWM they can be used as any of the remaining outputs. Avoid using channel 1 and 14 for inductive loads (relay coil or electric motor). The PWM function is activated in the individual channel setting. When selected a control bar will appear on the main page. The dimming output on channels 1 and 14 can deliver up to 2A.

NOTE: When used to control Lopolight Decklights (400-22x series) these outputs can control up to ~30 dedicated PWM inputs.

Aft Decklight Dimming

Edit channel #14

Name

Aft Decklight Dimming

Monitor mode

PWM

4.9.4 Grouped lights/channels external hardware control

The Control Hub has 4 hardware button inputs for controlling a group of channels. The inputs are protected by an optocoupler and can accept any voltage between 10 and 32 VDC for activation. Hint: An Anchor light can e.g. be assigned to group 1 and can be controlled either directly on the MFD or via a physical fitted pushbutton, this allows you to turn on/off the group even when the MFD is off. Often the anchor/cockpit/courtesy night lights need to be controlled when the MFD is turned off and by fitting pushbuttons you can do so. If a pushbutton is used for activation, then the selected group can be toggled by either the group button on the MFD, and/or the pushbutton. In case a steady state toggle switch is used for activation, then the programmed outputs can still be operated from the MFD group button.

New group

Name	Column	Hardware input
At Anchor	Second	Hardware input 1
Under Way	First	Hardware input 2

4.9.5 Group button programming

Once you have installed your lights/AUX hardware items, you will have to enter the settings to set up the group of lights which you then assign to a desired group channel. (see picture below).

New group

Name

Under Way

Column

First

Hardware switch

None

Group actions

Group	Action
At Anchor	Switch off
Towing <200m	Switch off
Towing >200m	Switch off
N.U.C.	No change
R.A.M.	No change

Pair actions

Pair	Action
Starboard	No change
Port	No change

Channel actions

Channel	Action
Port Secondary	No change
Port Primary	Switch on
Starboard Secondary	No change
Masthead	Switch on
Anchor	No change
Starboard Primary	Switch on
Stern	Switch on
Towing Stern #1	No change
Towing Stern #2	No change
Upper N.U.C.	No change

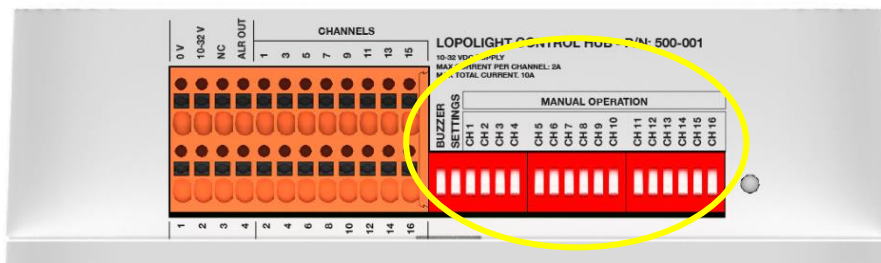
Close

Save

4.10 Manual override procedure

The manual override function requires that the unit has been placed in an accessible location. Each channel has a dip switch assigned, which allows you to override the MFD control, should the MFD for any reason not be working or shut down. Even if the internal computer breaks down, you will be able to control each channel via the Dip switch. **Note: If you have turned a switch ON and regain MFD connection, you can't control the**

channel before the Dip switch has been switched to OFF (down position).



4.11 Connect AUX items via relay

If the item you connect has a power consumption exceeding 2A, or the maximum total system power consumption exceeds 10A, a suitable driver relay may be fitted. See included Advanced wiring schematic diagram (Fig. C).

Make sure a suitable fly-back diode is connected over the coil!

NB: The channel assigned to drive a relay, is to be set in BASIC mode with no monitoring.

4.12 Connect sensor(s) to input

It is possible to use channels for sensor connections, even though the main purpose is an output function. Bilge pump or hatch sensors can be monitored and can be part of a bigger monitoring system. See included Advanced wiring schematic diagram (Fig. I).

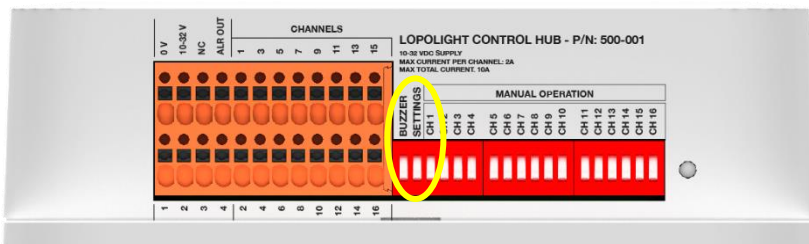
When a voltage is detected on the (normally) input this will trigger a selected icon to be displayed on the Home screen.

Also refer to section 5.10 for setting details.

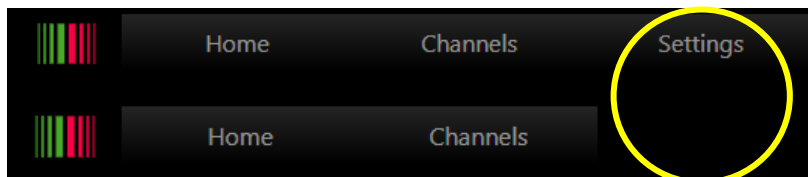
5 Settings

5.1 Activating Settings menu

To access the Settings menu, the assigned dip switch (no.2 marked “Settings”) needs to be activated (switched ON (pointing upwards) as in below picture).



Once finished setting up the system, the Dip switch can be switched OFF (pointing downwards), which removes the Settings menu from the MFD screen. **This is to avoid unauthorized access to the settings menu.** (remember to press “Home” after changing the dip sw. setting)



5.2 Access via MFD

Connect the Control Hub, to your MFD’s ethernet port (NOT via the SeaTaING/NMEA2000), via a Raynet/RJ45 ethernet cable connection. Turn on the Control Hub system and the MFD. There are different ways of activating the Lopolight APP on Garmin/RaymarineFuruno MFD’s (see below instructions).

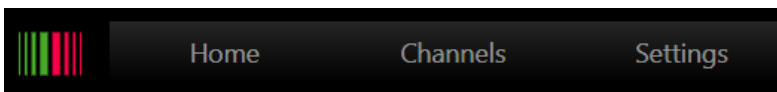
Garmin instructions: Goto the OneHelm selection under Home function, choose the Lopolight Logo APP and await the Control Hub to appear on

your screen. To setup further screen layouts such as splitscreen, please refer to your Garmin manual.

Raymarine instructions: Goto an empty APP page and hold your finger on the chosen location, a list of available APP's appears, scroll down and find the Lopolight Logo APP, select the APP and await the screen updates and the Lopolight Control Hub screen appears. Please refer to the Raymarine manual in order to setup more screen layouts such as splitscreen etc.

For both MFD brands, wait a few minutes until the Lopolight APP appears on your MFD screen, activate the Lopolight APP and wait for the Lopolight page to activate.

Press the Settings menu button (found in upper lefthand corner of the screen, see picture below). In case the Settings menu button isn't available, please check that the assigned Dip switch no. 2 is in UP position. The Settings menu opens the Settings page and allows the system to be configured (see chapter 5.5 for detailed configuration guide).



NOTE: Your MFD may not be able to enter characters via a text keyboard, in that case you must connect the Control Hub via Ethernet or WiFi to a computer or Tablet (see section "Access via computer" and "Access via WiFi").

5.3 Access via computer (Ethernet)

When setting up your system, you can access the Control Hub via an Ethernet Hub/Switch connection, which also is connected to the MFD.

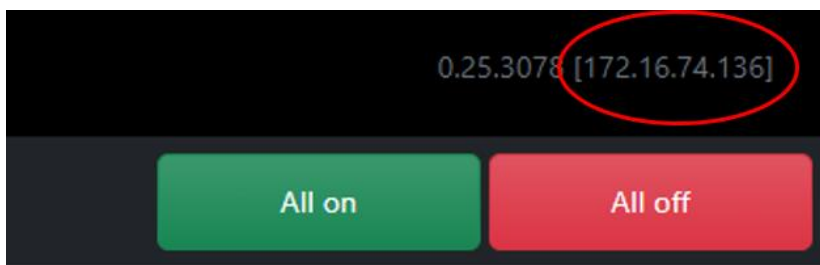
The physical connection is a standard RJ-45 connector.

The unit requires an IP address, assigned by a DHCP server in a normal ethernet environment. When installed in a system based on a modern MFD

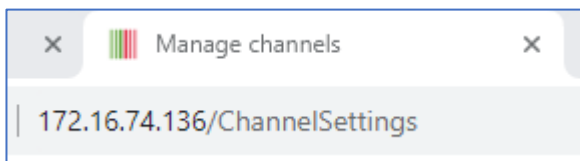
(Raymarine or Garmin etc.) then this unit will normally arrange this automatically.

When installed in a standard ethernet system, then the DHCP server in the system (normally the router) must be set up to always provide the same IP address for the Control Hub

The IP address is required to access the Control Hub software platform, the IP address will appear in upper righthand corner on the MFD display when in “Settings” menu, the below picture shows a dynamic IP address 172.16.74.136 which is inserted in a browser.



NOTE: this is only shown when the Settings menu is activated by Dip switch no. 2 being in Up position. Open a web browser on your computer and enter the IP address in the websearch area. If the computer can't access



the Control Hub, make sure the assigned Dip switch no. 2 is in UP position as shown below. Also refer to section 5.1

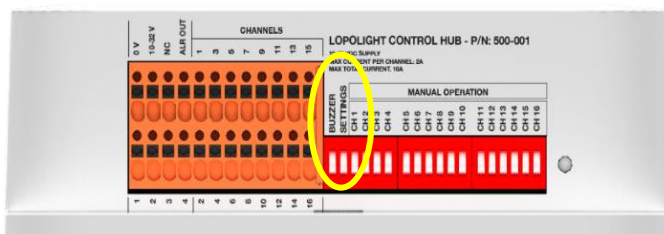
5.4 Access via WiFi (Computer and Tablet)

When setting up your system, you can access the Control Hub via a WiFi connection, which is wireless connected to the MFD. The IP address is required to access the Control Hub software platform, this will appear in

the upper righthand corner on the MFD display (see section 6.2). NOTE: this is only shown when the Settings menu is activated by Dip switch no. 2 being in Up position.

Connect your computer or tablet to the MFD WiFi network (see MFD manual for setting up the WiFi connection), log on to the WiFi and open a Web browser. Enter the IP address in the web search area and wait for the Control Hub to appear on the screen. Once the connection is established, you will then be able to finalize settings for the vessel type you have.

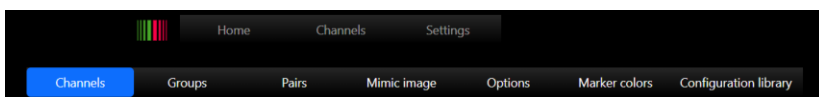
If you can't access the Control Hub via WiFi, make sure that the assigned Dip no. 2 switch is in UP position.



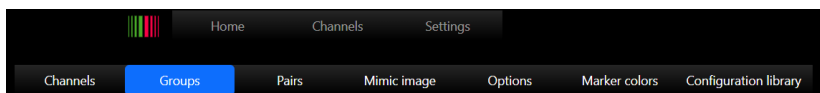
5.5 Settings Menu

The page that appears after pressing the “Settings” menu button, allows you to configure the Control Hub system.

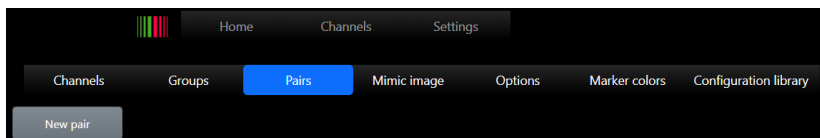
“Channels” section contains all 14 channels available, which you can name and set up individually.



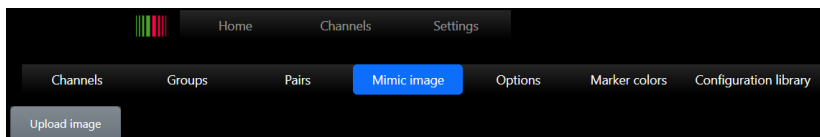
“Groups” section allows you to set up groups of channels to be controlled via an assigned group button.



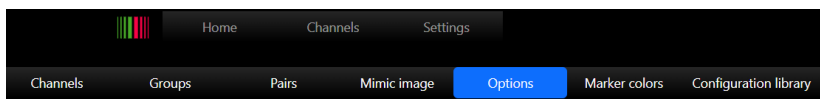
“Pairs” section allows you to pair a Primary and Secondary light, so if a Primary light for any reason fails, the Secondary light is activated automatically.



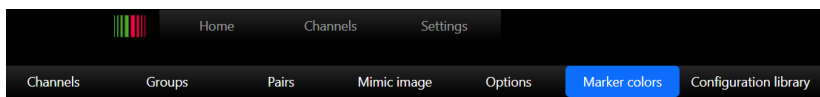
“Mimic image” allows you to import your desired background graphic (your own vessel or a drawing).



“Options” allows you to configure the Control Hub system in advanced ways (Button position, button size, font size etc.).

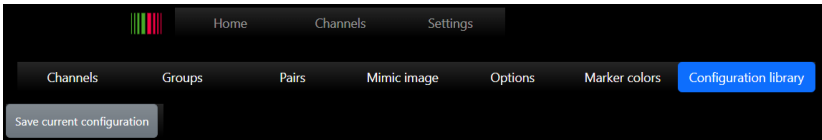


“Marker colors” allows you to change the color of graphic icons.



“Configuration library” allows you to import a vessel type from the internal library, with graphic background and pre-set of navigation lights that would

be normal for the vessel type. You can also save your own graphics and navigation light settings as backup.

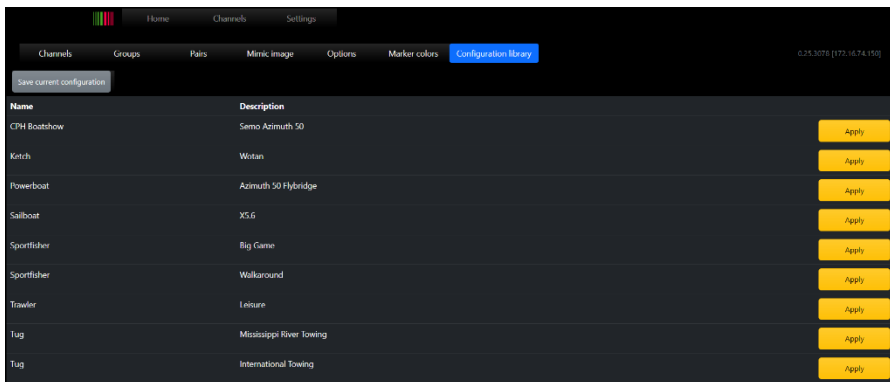


5.6 Choose background vessel graphic

You can choose a generic vessel background graphic from the vessel library, which will import desired vessel, and the lights normally used for the particular vessel model (see list of updated choices via link:<https://www.lopolight.com/solutions/lopolight-control-hub>). Once you have chosen vessel graphic, you can add extra buttons to control lights/AUX items (refer to chapter 5.11) depending on your own configuration. The vessel assigned navigation lights are placed in pre-configured positions, should you want to re-arrange their position, size, color etc. (refer to chapter 5.10).

To choose a pre-configured vessel layout:

1. Go to SETTINGS menu.
2. Click on CONFIGURATION LIBRARY.
3. Choose a desired vessel type from the library (see picture) and click on APPLY.
4. Accept or cancel the choice (YES or NO).
5. Go to HOME and see the chosen graphics.
6. Repeat the above action for choosing another vessel layout if required.



5.7 Import your own vessel background graphic

You can choose to import your own vessel graphic as background via a PC, the size of the graphic needs to 2000 pixels wide (height is not limited, if height is exceeding the screen view, a scroll bar in right hand side will appear and allow up/down to see all graphics), the file must be a PNG or JPEG graphic file in order to get accepted.

When creating your own graphics, it must be on a transparent background, or else it will show lines on the MFD screen.

To import the graphic file, go to SETTINGS menu, click “MIMIC IMAGE” menu and then “UPLOAD IMAGE”, after which you choose the graphic file on your computer, finish by clicking “UPLOAD” and go to “HOME” to see the result. In case the graphic is disrupted, please retry the above procedure.

5.8 Save current configuration

Once you have configured your channel settings, uploaded vessel graphics and configured the icons etc., then you can save your configuration into the CONFIGURATION LIBRARY for future use.

NOTE: *When you have finalized your configuration, we recommend that you switch off the SETTINGS menu via the DIP switch marked MANAGER, this hides the SETTINGS menu from unauthorized access.*

5.9 Choosing monitored vs unmonitored setting

Channel Mode defines the way the channel monitors or manages the channel configuration.

There is four ways of settings to choose from:

1. **LpL** is for Lopolight Navigation lights, which incorporate a selftest after 5 seconds.
2. **STANDARD** is for non-Lopolight Navigation lights, or Lopolight non-dimmable decklights and 3rd party products. The monitored current limit needs to be more than 20mA, other vice an alarm will sound.
3. **BASIC** is for PWM dimmable lights and Relays for which there is no current limit measured.
4. **PWM** is for channel 1 & 14 only, designed for Lopolight dimmable interior lights (400-2XX series), these channels need to be Grouped with dimmable lights to become controllable via a Slider on the screen (see picture below). Refer to section 4.11.3 for details.



5.10 Setting up a channel

You must set up each channel with the assigned light/item individual setting.

Go to "SETTINGS" menu and click on "CHANNELS", after which you can choose the channel, you wish to configurate. NOTE! Channels 1 & 14 is able to control dimmable interior light via PWM. *(If no dimming function is needed, then these two channels can be used as any of the other channels).*

1. **Name:** You can name the channel according to item function or any other useful indication of use.

2. **Choose channel mode:** LpL, Standard or Basic (PWM if available). See chapter 5.8 with explanation.
3. **Position from left:** Enter the icon position between value 0-1000. Once saved, you can revert to HOME screen and see the icon position (when turned on), adjust by repeating the procedure.
4. **Position from top:** Enter the icon position between value 0-1000. Once saved, you can revert to HOME screen and see the icon position (when turned on), adjust by repeating the procedure.
5. **Marker Shape:** Choose setting for the assigned light/item (225° Masthead - 112,5° Port - 112,5° Starboard - 135° Stern - 112,5°/112,5°/135° Tricolor - 112,5°/112,5° Combined Bow - 360° Circle - Direction light or Symbolic marker).
6. **Marker orientation:** Chose direction of icon (North – East – South – West), 360° doesn't need a setting.
7. **Marker scale (%):** Choose the size of the icon shown on the screen.
8. **Marker color:** Choose the color of the marker icon (White – Green – Red – Yellow – Blue – Orange).
9. Click on SAVE to exit setting.
10. Continue setting up each channel and check the result after exiting the last channel setting.

Edit channel #1

Name

Channel 1

Channel mode

Basic

Position from left

0

Position from top

0

Marker shape

360° Circle

Marker orientation

East

Marker scale (%)

100

Marker color

White

Close

Save

5.11 Setting up a group

Hint: in the following sections it may be a help to ask yourself: “what shall happen if I activate a group button”

You can set up a group to control one or more channels, which activates a button shown under the vessel graphic on the MFD, you can create as many groups as you need.

You can set up the groups to turn on under way navigation lights via one button and the anchor light via another. The buttons can turn on “Under Way” lights and at the same time turn off the “At Anchor” light and the other way when “At Anchor” is turned on, the “Under Way” lights turn off, this is all controlled in the set up of the groups. Follow below procedure to create and set up a Group:

1. Go to “SETTINGS” menu.
2. Go to “GROUPS” menu.
3. Click on the “NEW GROUP” button.
4. Enter the group name in “NAME” field. The group can be named with whatever text you wish.
5. Go to Column and choose in which column you want to place the button (1 to 6 columns, if you choose the same column for more groups, they will be placed on top of each other).
6. Under “Channel actions” you can add the action required for the channels assigned into the group (No change – Switch off – Switch on).
7. Hardware switch: If you install a physical hardware pushbutton/switch you can choose the Hardware input (1-4).

5.12 Configure a group to turn off another group

Under “Group actions” you can set up whether one group turns off another group, this is often used for UNDER WAY and AT ANCHOR groups (see picture).

The N.U.C. (Not Under Command) lights can be used in both UNDER WAY and AT ANCHOR, so that group needs to be set as NO CHANGE.

New group

Name

At Anchor

Group actions

Group	Action
Under Way	Switch off
N.U.C.	No change

5.13 Pair lights in a group

You can choose to pair two lights (primary and secondary), in this case you need to have a double light (often used for the navigation lights: Starboard/Port/Stern/Masthead). If a primary light should fail, the secondary light will automatically turn on and you will get a visual and an audio alarm, that informs you of the situation.

Setting requires primary and secondary channels for example is named Stern Primary and Stern Secondary, for the system to show the two lights when programming.

1. Go to SETTINGS and click on the PAIRS.
2. Click on NEW PAIR.
3. Enter the name in the case Stern in the NAME field.
4. Click in the PRIMARY CHANNEL field and choose the Stern Primary light in the dropdown menu. The icon for the Primary Stern light is a 135° solid icon.
5. Click in the SECONDARY CHANNEL field and choose the Stern Secondary light in the dropdown menu. The icon representing the Secondary Stern light is a 135° semi-circle icon.



6. Once saved, the PAIRS menu shows the configuration as below picture:

New pair		
Name	Primary channel	Secondary channel
Stern	Stern Primary	Stern Secondary

7. Continue setting up the rest of the desired lights to be paired.
NOTE: *It is important that the icon is positioned at the same position (X/Y), otherwise other vice the icons will be at different positions!*
8. Once set up, you must revert to the GROUPS menu and enter the group with the paired lights. the “Pair actions” will now show paired lights in the chosen group.

Column

Second

Pair actions

Pair	Action
Stern	Switch on

9. It is important that Action in “Pair actions” is set for “Switch on”, and that the Action in “Channel actions” is set for “No change”!
NOTE: *If the light in “Channel actions” is set for “Switch on” the primary and secondary lights will conflict.*

5.14 Option settings

There are several option settings that can be applied, some are more used, and others are not to be adjusted without caution (*save your configuration in the “Configuration library” prior to adjusting “Options” settings*).

5.14.1 PAC voltage cutoff (V) IMPORTANT SETTING.

The minimum voltage defining output on state. This also controls activation of the various icons. In the “Configuration library” you can choose vessel layouts pre-set for either 24V or 12V, if you create your own vessel setting, you need to make sure you set the value correctly (see below values).

For 24VDC system set at the value at 16.

For 12VDC systems set at the value at 8.

To change the setting, press the “SETTINGS” menu button, go to the “OPTIONS” menu and scroll down to the bottom function “PAC voltage cutoff (V)” and enter the value in righthand side and make sure to save the setting.



PAC voltage cutoff (V)

9

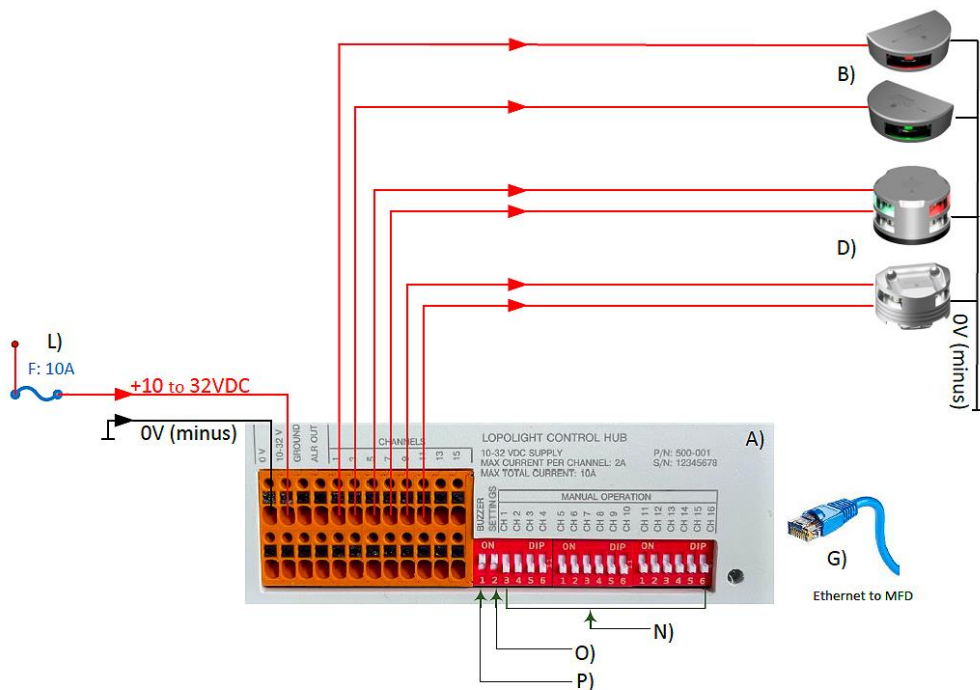
Save

6 Basic system diagram

The following refers to the wiring example in chapter 6 and 7.

The installation diagram shows a few examples, and do not reflect a relevant installation in itself. The unit is highly configurable, so the outputs can be assigned to any desired light or sensor.

The Lopolight Control hub is still active even if the MFD is off, meaning that all monitoring and thereby alarm in case of failing light, is still in functional. (Channel 6 & 16 not used in this example).



6.1 Basic system: Reference A

The Lopolight Control Hub [LCH] provides 16 configurable channels (outputs), 4 dedicated inputs, power input and external alarm output. The unit holds a webserver that enables operation from a multifunction display [MFD], or a web browser that enables the user to operate the unit.

6.2 Basic system: Reference B

Standard connection of Lopolight navigation light to individual channel. Each navigation light should be connected to a dedicated channel to enable proper monitoring of the correct function.

The output should be defined as "Lopolight mode". All lights in the system must be connected to vessel 0V with their minus wire/connection.

6.3 Basic system: Reference D

Dual function Lopolight navigation light:

Each function/light should be connected to a dedicated channel to enable proper monitoring of the correct function. In case of split power connections, both 0V connections must be connected to vessel 0V with their minus wire/connection. The output for the masthead light should be defined as “Lopolight mode”, the output for the deck light should be defined as “Basic mode” *.

6.4 Basic system: Reference G

Ethernet connection:

Physical connection is a standard RJ-45 connector.

The unit requires an IP address, assigned by a DHCP server in a normal ethernet environment. When installed in a system based on a modern MFD (Raymarine, Garmin, Furuno, ao.) then this unit will normally arrange this automatically.

When installed in a standard ethernet system, then the DHCP server in the system (normally the router) must be set up to always provide the same IP address for the LCH.

6.5 Basic system: Reference L

Power-supply and outputs:

Supply voltage is 10-32 VDC. Each output can deliver a maximum of 2A. Total maximum for the complete system is limited to 10A. If this limit is exceeded, then the unit will automatically turn off a random channel to hold the total current under the 10A limit. The outputs will supply the same voltage as it is supplied with. All external equipment (lights, sensors etc.) must be connected to the systems common 0V (vessel minus). The complete system should be protected by 10A circuit-breaker (C char.) or fuse (slow). The individual outputs are protected against short-circuit and will shut down in such an event. Short circuit is defined as a current consumption higher than 2A.

6.6 Basic system: Reference N

Emergency control option:

16 small switches, each controlling an individual output, can be activated in case the MFD or another network component should fail. If the switch is active – then the output cannot be controlled by the MFD but remains constantly ON.

6.7 Basic system: Reference O

Protected set-up menu on MFD:

This switch enables editing and set-up of the unit (via MFD). If the switch is in uppermost position editing and set-up is enabled.

HINT - example of smart use:

See to that the switch is in off position once the settings are ready. This prevents system changes by crew that are not supposed to do so.

6.8 Basic system: Reference P

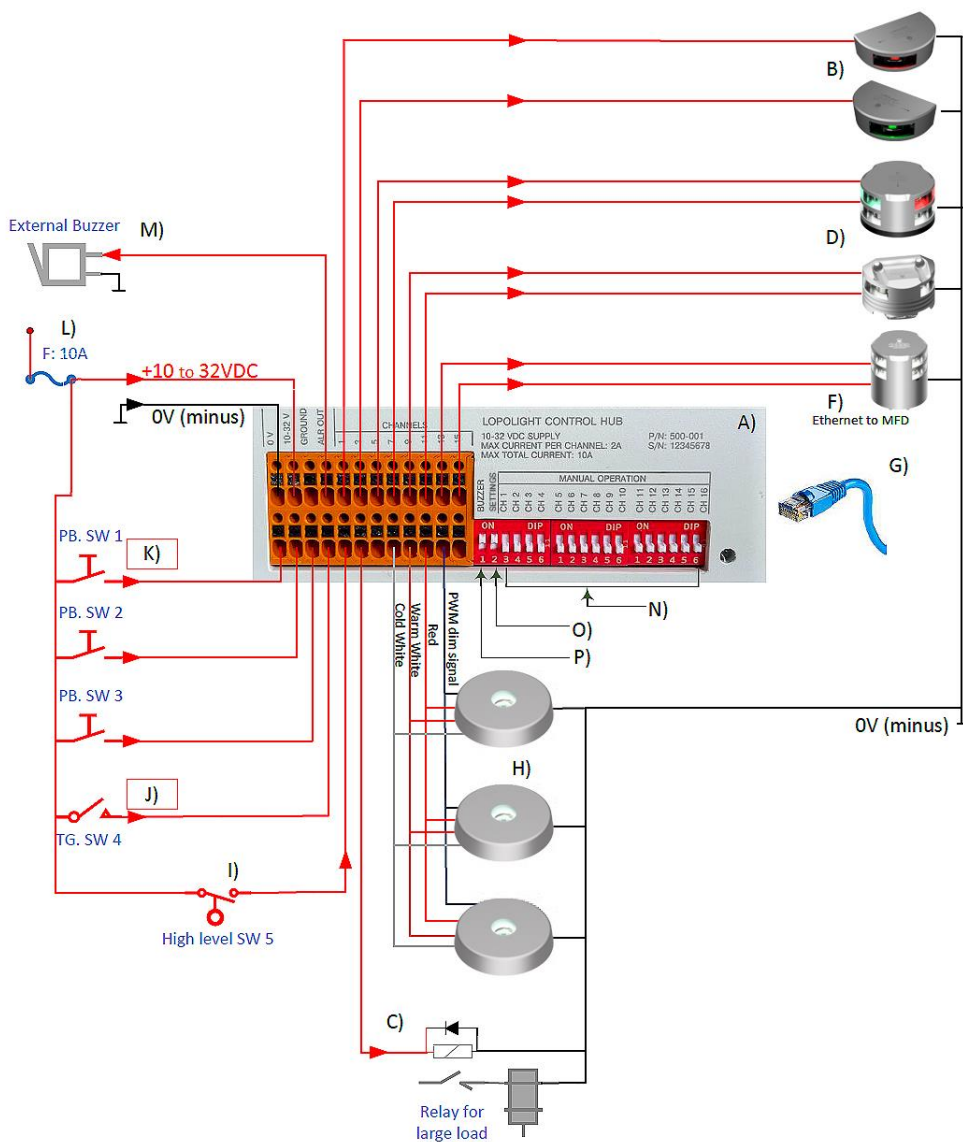
Internal buzzer:

The internal alarm buzzer is activated in case of alarm condition.

If the component (light, sensor or switch) causing the alarm cannot be disconnected, then a dedicated switch can mute the internal buzzer.

(The buzzer is active when the switch is in uppermost position).

7 Advanced system diagram



7.1 Advanced system: Reference A

The Lopolight Control Hub [LCH] provides 16 configurable channels (outputs), 4 dedicated inputs, power input and external alarm output. The unit holds a webserver that enables operation from a multifunction display [MFD], or a web browser that enables the user to operate the unit.

7.2 Advanced system: Reference B

Standard connection of Lopolight navigation light to individual channel. Each navigation light should be connected to a dedicated channel to enable proper monitoring of the correct function.

The output should be defined as “Lopolight mode”. All lights in the system must be connected to vessel 0V with their minus wire/connection.

7.3 Advanced system: Reference C

Driving a relay coil:

If large loads (Wipers, Pumps etc.) a relay can be installed.

Please see to proper installation of a clamping diode across the coil to prevent high voltage kick-back to unit.

Avoid using output 1 and 14 for large inductive loads The output should be defined as “basic mode” *. * the different modes are described under paragraph 6.8 in the manual

7.4 Advanced system: Reference D

Dual function Lopolight navigation light:

Each function/light should be connected to a dedicated channel to enable proper monitoring of the correct function. In case of split power connections, both 0V connections must be connected to vessel 0V with their minus wire/connection. The output for the masthead light should be defined as “Lopolight mode”, the output for the decklight should be defined as “Basic mode” *.

7.5 Advanced system: Reference F

Stacked Lopolight navigation light: (Nav light with main & spare light)

Both primary and secondary light must be connected to individual channel. The two channels must be defined as a “pair” in the set-up, and the output should be “Lopolight mode”. If one light in the pair should fail, an alarm will be given and the spare light will activate automatically. The output should be defined as “Lopolight mode” *.

7.6 Advanced system: Reference G

Ethernet connection:

Physical connection is a standard RJ-45 connector.

The unit requires an IP address, assigned by a DHCP server in a normal ethernet environment. When installed in a system based on a modern MFD (Raymarine, Garmin, Furuno etc) then this unit will normally arrange this automatically.

When installed in a standard ethernet system, then the DHCP server in the system (normally the router) must be set up to always provide the same IP address for the LCH.

7.7 Advanced system: Reference H

Pulse width modulated (PWM) output:

Channel 1 and 14 can be set-up act as PWM outputs that can control light intensity. Max output current is 2A. (Lopolight decklights has dedicated PWM control, separated from the power input)

The output should be defined as “PWM mode” *.

HINT - example of smart use: Controlling Lopolight decklights from MFD.

The Lopolight decklight holds three LED's: Red, Warm white and Cold white.

Connect each power wire to individual outputs, and the (blue) PWM input to either channel 1 or 14.

This enables you to control the light in a very detailed way.

- 1) Cold white.
- 2) mix of Cold & Warm white light
- 3) Warm white
- 4) Red light

All dimmable and controlled from the MFD

Several deck lights can be connected in parallel. Output for the three power lines should be defined as "Basic Mode" *.

7.8 Advanced system: Reference I

Use a channel output as input:

If a sensor is connected to an output, then an icon can be displayed on the MFD when it is active.

HINT - example of smart use:

Connect a float switch to any output (channel) and the assigned icon will be displayed in case of high water level in undesired spaces. The channel (now input) should be defined as "Basic Mode".

7.9 Advanced system: Reference J

Use toggle switch to control group-button:

If a toggle switch is used instead of a pushbutton sw. ("K"). The output can still be operated from the MFD, regardless of the position of the toggle switch. (If coupled in this way then the toggle switch may end up in an illogical position). Working principle: The LCH will detect that the trigger signal is more than 2 seconds and define that this is likely to be stable switch.

HINT - example of smart use:

Your current installation may already have a number of traditional switches used for controlling your navigation lights. Keeping these

7.10 Advanced system: Reference K

Group button, hardware inputs:

Four hardware inputs that can be set up to activate a soft-button group are available.

They are protected by an optocoupler and can accept any positive input signal between 10 and 32 VDC. Normally a push-button switch type is used as this gives possibility to toggle the function by operation on either push-button or soft-button.

HINT - example of smart use:

A (waterproof?) push-button can be connected to one of the four inputs that is set up to control a group that operates the anchor light. When at anchorage and MFD is turned off, then you can still operate the anchor light – and retain the alarm function if it fails during the night!

7.11 Advanced system: Reference L

Power-supply and outputs:

Supply voltage is 10-32 VDC. Each output can deliver a maximum of 2A. Total maximum for the complete system is limited to 10A. If this limit is exceeded, then the unit will automatically turn off a random channel to hold the total current under the 10A limit. The outputs will supply the same voltage as it is supplied with. All external equipment (light sensors etc.) must be connected to the systems common 0V (vessel minus). The complete system should be protected by 10A circuit-breaker (C char.) or fuse (slow). The individual outputs are protected against short-circuit and will shut down in such an event. Short circuit is defined as a current consumption higher than 2.1 A.

7.12 Advanced system: Reference M

Output for external alarm:

An external alarm (typically via service relay) can be connected to this output. In the event of an alarm condition this output will deliver supply voltage. Maximum allowed current: 200 mA. This output is NOT protected

from overconsumption. The external alarm output can NOT be disabled by switch mentioned under paragraph “P”

HINT - example of smart use:

Install an alarm buzzer where it will wake up responsible crew in case of failing anchor light!

7.13 Advanced system: Reference N

Emergency control option:

16 small switches, each controlling an individual output, can be activated in case the MFD or another network component should fail. If the switch is active – then the output cannot be controlled by the MFD but remains constantly ON.

7.14 Advanced system: Reference O

Protected set-up menu on MFD:

This switch enables editing and set-up of the unit (via MFD). If the switch is in uppermost position editing and set-up is enabled.

HINT - example of smart use:

See to that the switch is in off position once the settings are ready. This prevents system changes by crew that are not supposed to so.

7.15 Advanced system: Reference P

Internal buzzer:

The internal alarm buzzer is activated in case of alarm condition.

In the event that the component (light, sensor or switch) causing the alarm cannot be disconnected, then a dedicated switch can mute the internal buzzer.

(The buzzer is active when the switch is in uppermost position).

8 Troubleshooting

Below table highlights the most common errors and their solutions.

Problem	Solution
The alarm doesn't sound	Make sure the buzzer activation dip switch is ON (up position)
The SETTINGS menu doesn't show on the MFD screen	Make sure the DIP switch is OFF (down position). (remember to press "Home" after changing dip-sw. position)
The PWM control slider doesn't show on the MFD screen	Make sure "Channel Mode" setting is for PWM use, also in the Group button setting, the PWM channel needs to be set as "Switch on" together with the dimmable lights
Paired lights don't switch secondary light on when primary light fail is performed	Check that the paired light is set as "Switch on" and the individual light channel is set as "No change" (see chapter 5.13)
When turning on lights/group buttons, there is no reaction	Make sure "the PAC voltage cutoff (V)" value is set correctly. For 24VDC systems the value is set at 16 and for 12VDC systems the value is set at 8. (see chapter 5.14.1)
The uploaded vessel graphic doesn't show or shows wrong on the MFD screen	The vessel graphic size is based on maximum 2000 pixels wide, the height is not so important, the height can result in the graphic is cut and scrolling down is required. The graphic file accepted is PNG or JPEG.
The Control Hub screen graphic doesn't show on my MFD	Check the Ethernet cable connection between the MFD

	and the Control Hub is installed correct. Check the LED (Green/Yellow/Red) indicator on the Control Hub (next to the Ethernet port) shows activity when turned on.
My Garmin MFD don't show the Lopolight icon on the HOME screen	Check you have the latest software version from Garmin support site.
My Raymarine MFD don't show the Lopolight icon on the HOME screen	Check you have the latest Lighthouse 4 software version from Raymarine support site.

8.1 Reset settings

To reset settings, choose a new vessel type from the CONFIGURATION LIBRARY, this will reset all settings according to preset values/settings, after which you can start configuration your system again.

8.2 Technical support

Link: <https://www.lopolight.com/solutions/lopolight-control-hub>



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