light Shark series.

V_1.3.31

WORK PRO

Introduction

lightShark series is a new concept in lighting control systems that adapts to the needs of everyday life, offering a compact, powerful and economical solution. Perfect for small events, nightclubs, theatre schools, corporate events, and for small live events.

Today's technicians and lighting designers require flexible control solutions that enable impressive looks to be created in a short period of time, and that are easy to use for users with basic knowledge, but at the same time able to offer the advanced functions required by the most advanced users.

Our hardware and software departments have worked hard to provide you with a simple, powerful and compact lighting system.

At WorkPro we hope it meets all your expectations.

Thank you very much for trusting us.

WORK PRO

LIghtShark series user manual

By WorkPro

Equipson S.A.

Copyright

The guarantee of the product or service will not be extended if: (1) the product is repaired, modified or altered, unless the repair, modification or alteration is authorized in writing by Equipson SA; (2) the serial number of the product cannot be clearly read or is not present.

EQUIPSON SA PROVIDES THIS MANUAL "AS IS" WITHOUT WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES, MARKET CONDITIONS OR ADJUSTMENTS FOR ANY PURPOSE. IN NO EVENT SHALL EQUIPSON SA, ITS DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS BE LIABLE FOR ANY DAMAGES, WHETHER INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL (INCLUDING DAMAGES FOR LOSS OF PROFITS, BUSINESS, LOSS OF USE OR DATA, BUSINESS INTERRUPTION OR THE LIKE), EVEN IF EQUIPSON SA HAS BEEN ADVISED THAT THE POSSIBILITY OF SUCH DAMAGES MAY ARISE FROM ANY DEFECT OR ERROR IN ITS MANUALS OR PRODUCTS.

THE SPECIFICATIONS AND INFORMATION CONTAINED IN THIS MANUAL ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE SUBJECT TO CHANGE AT ANY TIME WITHOUT NOTICE AND MAY NOT BE USED AS A COMMITMENT BY EQUIPSON SA. EQUIPSON SA ASSUMES NO RESPONSIBILITY FOR ANY ERRORS OR INACCURACIES THAT MAY APPEAR IN THIS MANUAL, INCLUDING THE PRODUCTS AND/OR THE SOFTWARE DESCRIBED IN IT.

The products and corporate names appearing in this manual may (or may not) be trademarks or copyrights of their respective companies, and are used herein only for identification or explanatory purposes and for the benefit of the owner, without intent to infringe such standards.

Policy

This equipment complies with EMC Directive 2004/108/EC and LVD 2006/95/EC.

This product is approved by the following safety standards: EN 60950~1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013

AND EMC standards EN55022: 2010 EN61000-3-3: 2013 EN55020:2007+ A11 EN61000-4-2: 2009 EN61000-4-3: 2006 + A1+ A2

ATTENTION: Any modification or change made to this device, unless explicitly approved by Equipson SA, will void the authorization to use this device.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

For further details please contact: Equipson SA, AV El Saler nº14, Silla, Valencia, Spain. Telephone: +34 961 216 301 E-mail: support@equipson.es

Section 1: Introduction

1.1 Explanation of the LightShark system

The light**Shark** series family consists of two devices:

LS-1 is a new generation of web-based lighting consoles designed for all types of events. It offers a simple, powerful and portable multi-platform control system.

LS-Core is focused on those technicians who need the features of a complete lighting console but in the smallest possible space. Thanks to its internal task scheduler it is an ideal solution for fixed installations.

Both devices have the following features

- 4096 DMX channels
- ArtNet and sACN output
- 1200 Cues
- CueList
- 30 Pages
- 10 Main Playbacks
- 20 Playbacks in Wing mode
- Full MIDI mapping
- Fan Function
- Parallel execution of multiple CueLists
- Completely configured Executor Window
- Numeric keypad
- Integrated FX Generator
- Multi Touch Interface
- Simultaneous connection (up to 3 devices).
- Rapid patching
- User palettes
- Control of size and speed of the Fx through the submasters.
- Virtual Dimmer

1.2 LS-1

The LS-1 consoles offer the user a control system with 4 encoders, 10 master playbacks and an integrated color display combined with a set of RGB buttons to create spectacular shows.

Thanks to its small size, it can be transported as carry-on luggage. In the back, there is a support to accommodate devices such as tablets. In addition, it includes a USB charging port located on the rear panel, which allows you to charge your movile devices .

Layout

1 Grand Master
2 Blackout
3 Page selection
4 Editing functions
5 Selection access keys
6 Go Keys
7 Playbacks Zone
8 Flash Buttons
9 Encoders
10 Playback control buttons
11 Selection buttons
12 Function buttons FIND-CLEAR-REC
13 Parameter selection buttons
14 FX Generator Access Button
15 Information display screen

Rear Panel

1 Connection port for 5v lamp

2 DMX output (2 universes)(3-Pin or 5-Pin XLR for both)

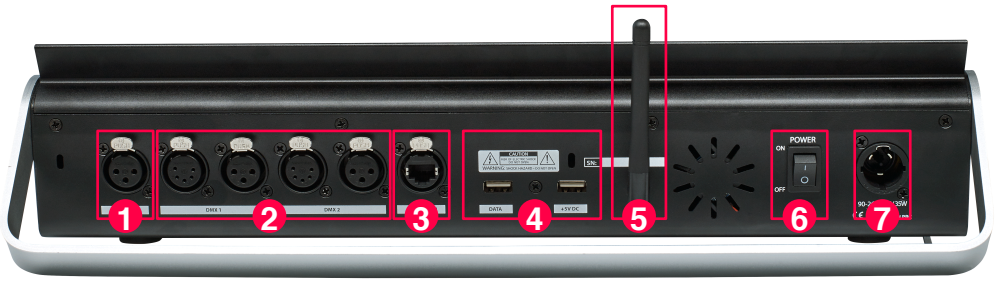
3 Ethernet port (EtherCON)

4 USB ports, one for charging and one for data.

5 WiFi antenna

6 Power switch

7 Power supply connection (True1)



Dimensions (WxHxD): 430x100x330cm

Weight: 3.7Kg

1.3 LS-Core

The LS-Core is the smallest 8-universes lighting console on the market, incorporating all the features of the LightShark software. It has a USB port to connect a MIDI controller, allowing you to use faders and physical buttons.

LS-Core is especially useful as an architectural controller thanks to its internal event scheduler and its small size, which can be installed anywhere.

1 USB data port
2 Navigation buttons
3 Wifi Antenna
4 Information display screen

5 Physical DMX output ports (2 universes)
6 Ethernet port (EtherCON)
7 Power connection

Dimensions (WxHxD): 10.8x4x14.2cm

Weight: 460g

1.4 Security Information

Read the instructions contained in this manual carefully and thoroughly, they contain important information for your safety during use and maintenance. Keep this manual with the unit for future reference. If the unit is sold to another operator, be sure to always include this manual to allow the new owner to read the operating instructions.

Warning:

This product must be grounded.

DO NOT ALLOW any flammable liquids, water or metal objects into the unit.

To prevent risk of fire or electric shock, do not expose the device to high temperature or humidity.

Be careful not to damage the unit's power cord.

DO NOT open the unit, there are no operating elements inside.

NEVER attempt to repair the unit yourself. Repairs by unqualified personnel may cause damage or malfunction. Contact your dealer.

Wait at least 5 seconds to turn the unit on after turning it off.

This unit is designed for indoor use.

After removing the packaging, check that the unit has not been damaged. If in doubt, do not use it and contact your dealer.

Packaging material (plastics, boxes, foam, etc.) should not be placed within the reach of children, as this may be dangerous.

Stop using the unit immediately in case of serious operating problems and contact your dealer.

Do not dismantle or modify the unit.

Section 2: Getting Started with lightShark

2.1 Connection Options

LightShark uses an integrated Web Server to provide all its functions to computers, tablets and smartphones that have a web browser. Simply connect to the LS-1 or LS-Core's integrated WiFi access point. Alternatively, you can connect via the computer's Ethernet port for a wired connection.

Due to the technology used by lightShark, the use of the following web browsers is recommended:

FireFox v67 onwards https://www.mozilla.org

Chrome v75 onwards https://www.google.com/chrome

Safari v11 onwards https://www.apple.com/safari

All of these web browsers have versions for both desktop and mobile devices.

It is possible to connect up to three devices simultaneously to lightShark, so you can access different windows on each of the devices at the same time. Once the third device has been connected, lightShark will reject the rest of the connections.

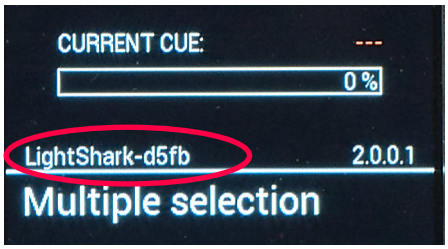
LS-1 and LS-Core devices have two network interfaces, one wireless and one wired.

The wireless network interface is an integrated 2.4GHz Wifi access point. This access point creates a wireless network with the default SSID "lightsharkXXXX". where XXXX refers to the last four digits of the MAC address of the wireless interface. How to modify the SSID of the device is detailed below.

By default the WiFi network password is "sharkjaws". How to modify the device password is detailed below.

It is possible to find the name of the SSID of the devices in the screen of each one of them:

En LS-1:



En LS-Core:

-The wired network interface allows lightShark to be connected to other network devices or to integrate lightShark into an existing network.

The ethernet port has 2 different IP addresses, so it is possible to connect lightShark devices to multiple networks using the same physical connection:

Ethernet: Allow connection to the local area network shared with other devices. It can be configured in either manual or automatic mode. By default it is configured with a fixed IP.

DMX Streaming: Allows the transmission of DMX through Art-Net or sACN. By default it is configured to be able to communicate from factory to a Class A IP address scheme in the 2.x.y.z range.

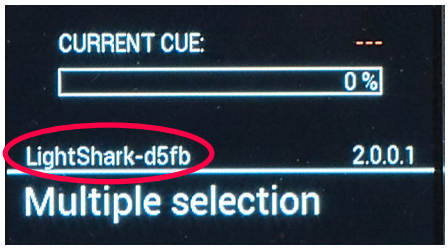
The default address for lightShark devices is 2.0.0.1 and the subnet mask 255.0.0.0.0. This allows Art-Net or sACN devices to communicate directly to lightShark without the need for a DHCP server connected to the network.

This allows to control lightShark from the same network where there are other devices (sound tables, control software...) and at the same time emit DMX to the Nodes that require a specific network configuration according to the protocol used.

To connect to lightShark through ethernet you must configure the IP address of your device in the same subnet.

It is possible to find the name of the SSID of the devices in the screen of each one of them:

LS-1:



LS-Core:

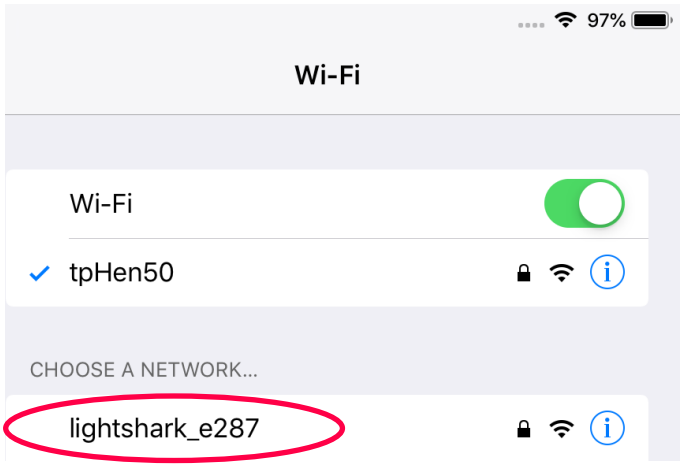
2.2 Using lightShark from mobile devices

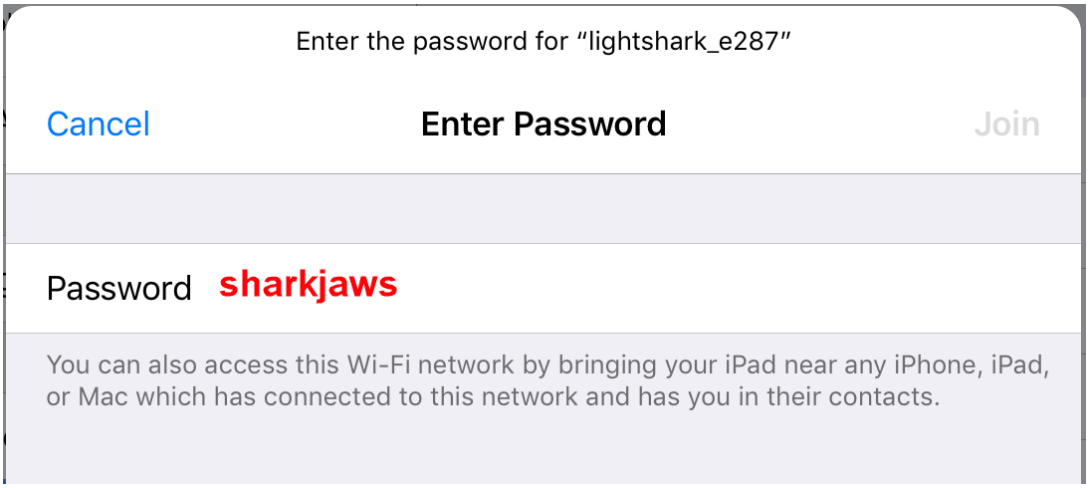
To connect to LightShark devices, through the wireless network using a tablet device, the steps are as follows:

1 Check that the WiFi antenna is correctly connected to the device, then connect the external power supply and turn it on.

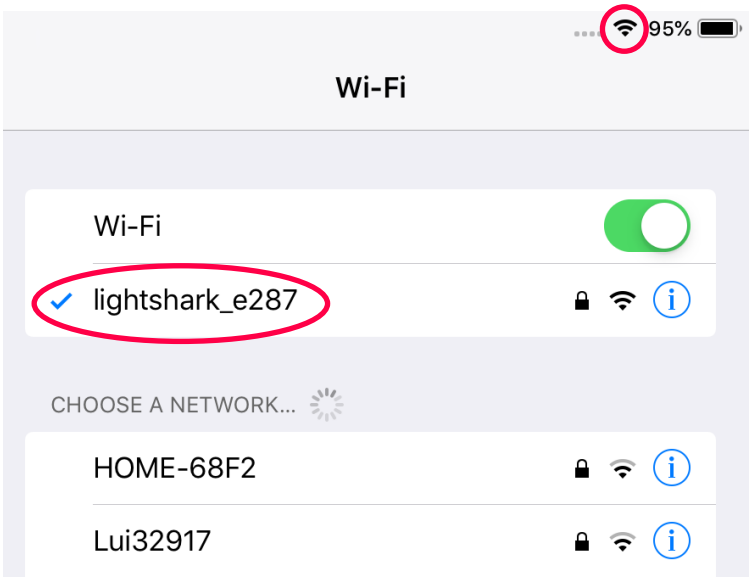
You will notice that the LCD screen of your device will illuminate, wait until the device has fully started and the network name is displayed.

2 Navigate to the WiFi network settings of your device and connect to the "LightShark-xxxx" access point. If this is the first time you connect, the default password will be "**sharkjaws**".





-Once the password has been entered correctly, lightShark will automatically assign an IP address to your device (tablet, mobile phone, computer, etc).



3 Start your device's web browser and enter the **lightshark.work** address in the URL field or the IP address 192.168.42.1. You should see the lightShark loading screen and you will quickly be taken to the Palettes window.

-It is possible to connect via ethernet from a tablet using a lightning-ethernet adapter (for iOS devices) or an OTG-ethernet adapter (for Android devices).

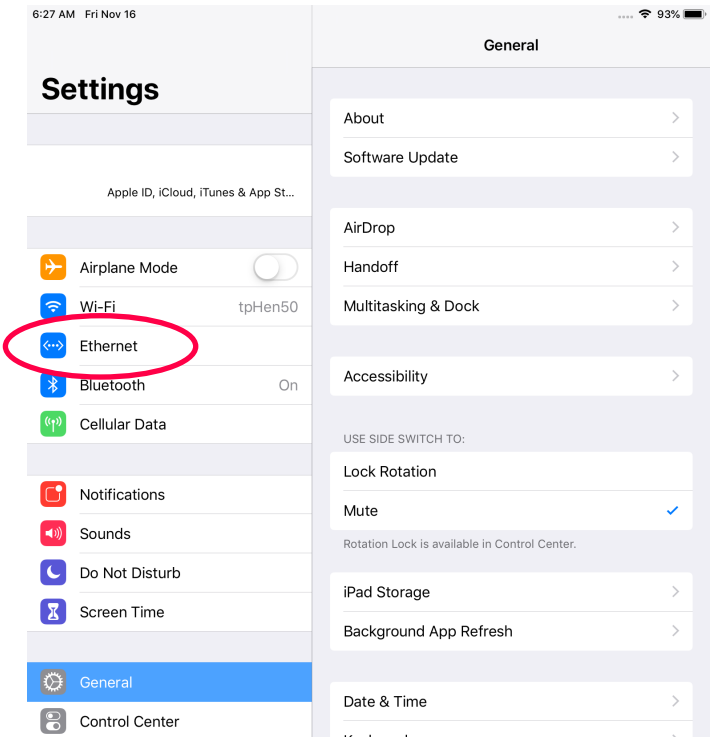
For iOS

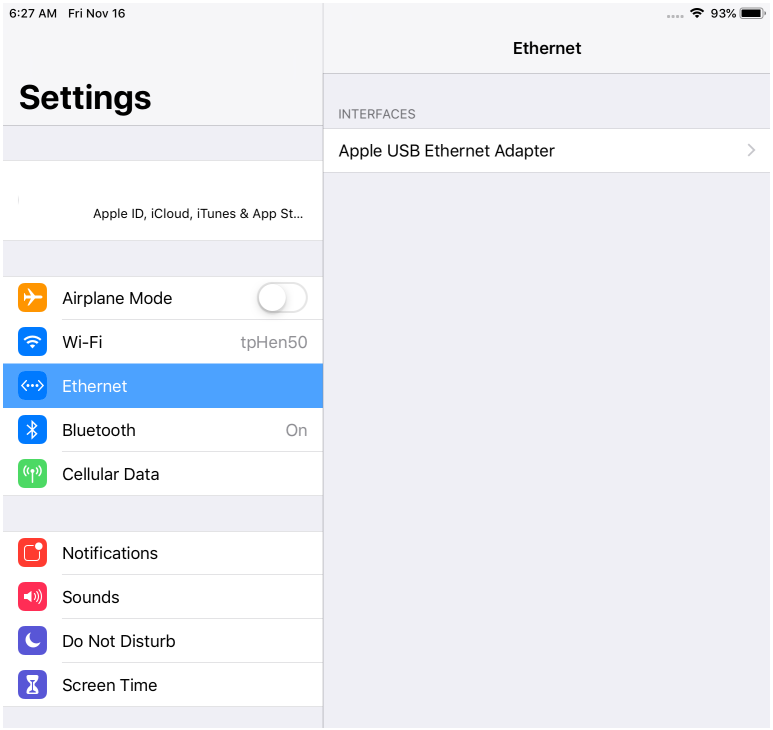
For Android

-To connect to LightShark devices through the wired network using a tablet:

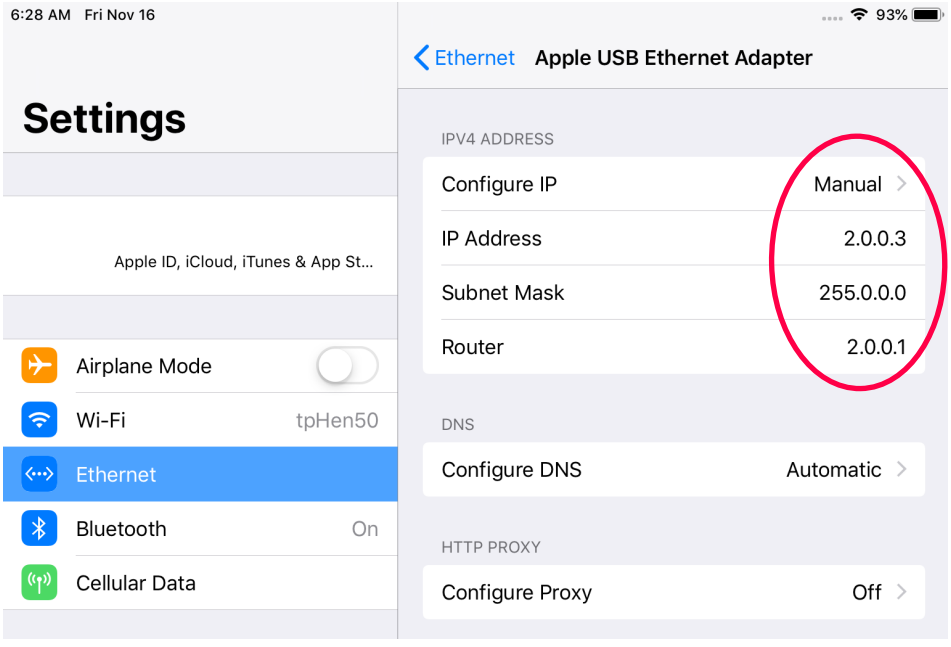
1 Check that the ethernet adapter is correctly connected to the tablet . Then connect an ethernet cable between the adapter and the lightShark device.

2 Access the preferences, in the sidebar you will find the new Ethernet interface:



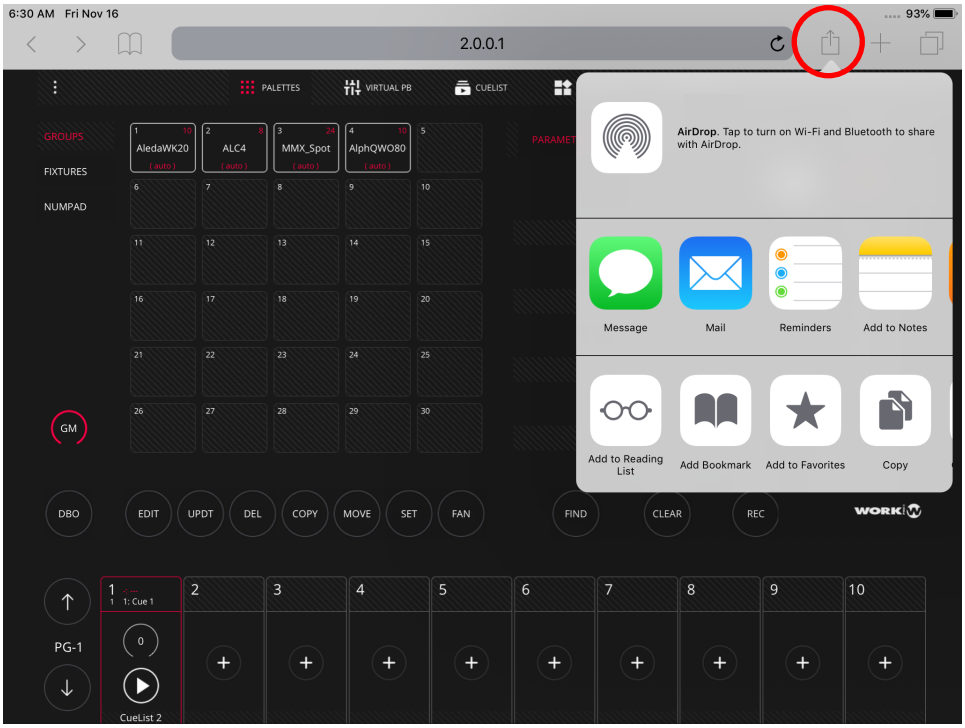


3 Then set the interface as "Manual" and the IP address and Subnet Mask as in the following example:

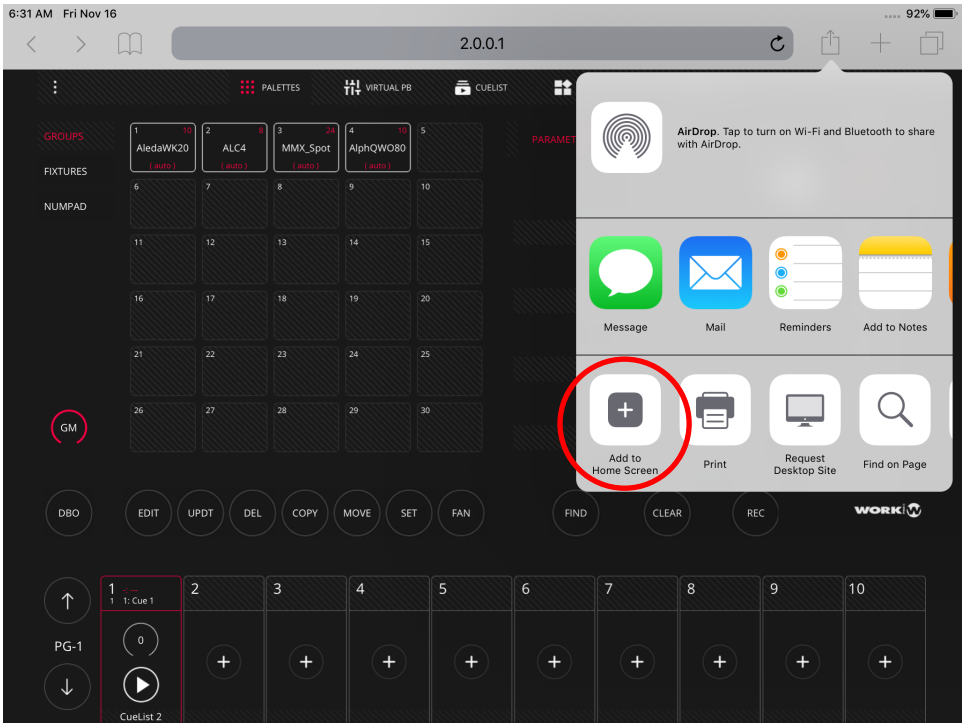


It is possible to add the lightShark website to the iOS or Android home screen. This will create an icon and will automatically access lightShark in full screen mode without having to open the web browser.

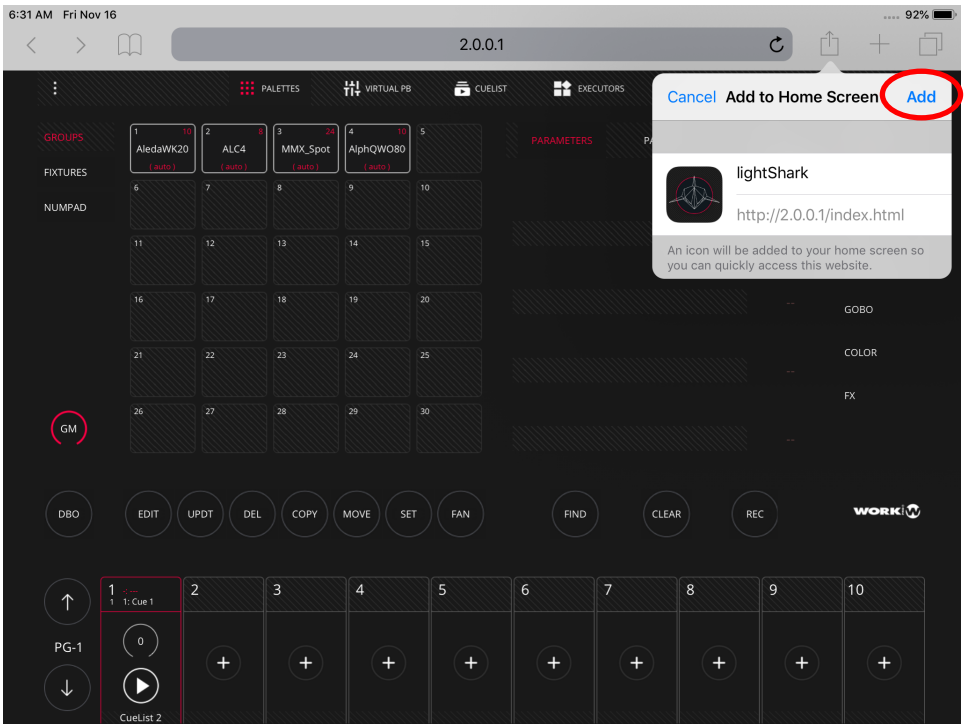
1 Launch Safari (or Chrome in Android) and select the share option:



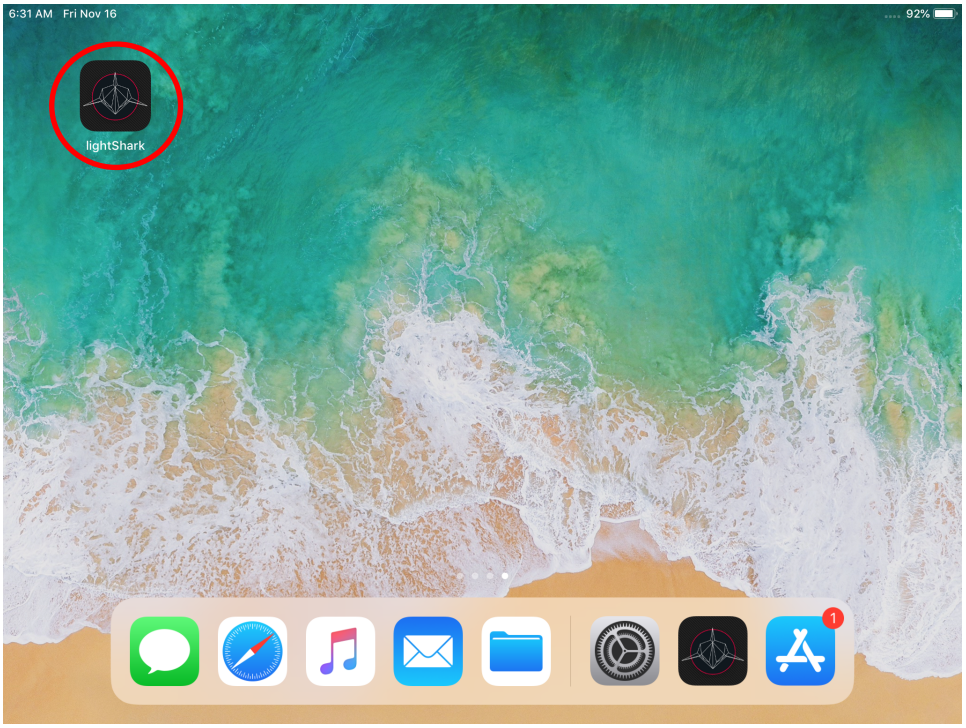
2 Then select the "Add to Home Screen" option. You may have to scroll over on the icons to access this.



3 Press “Add”:



4 The icon will be added to the home screen:

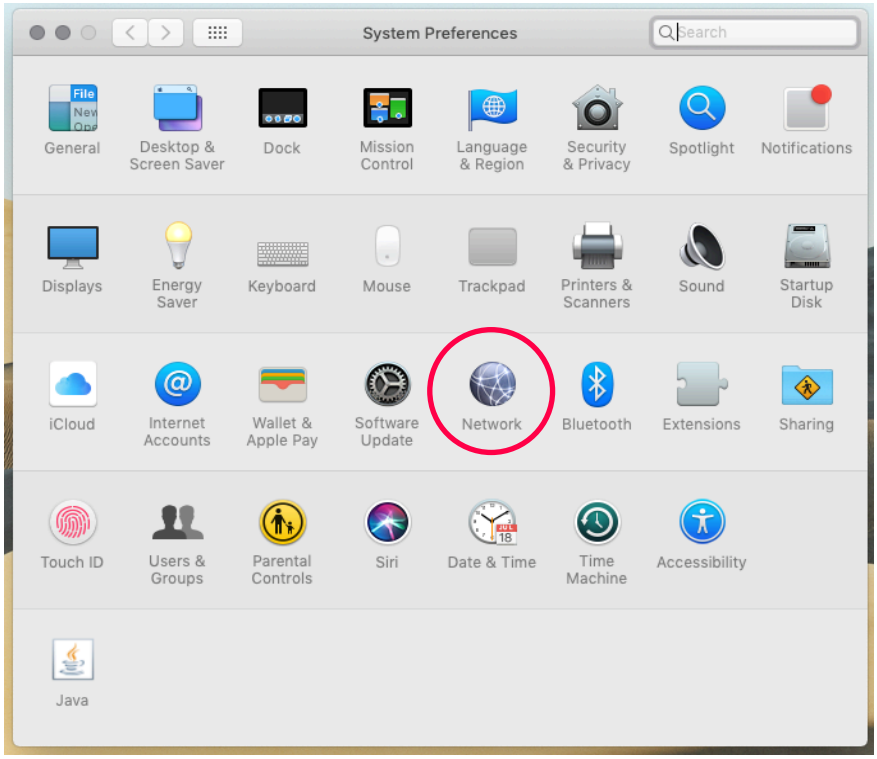


2.3 Using lightShark from a Computer

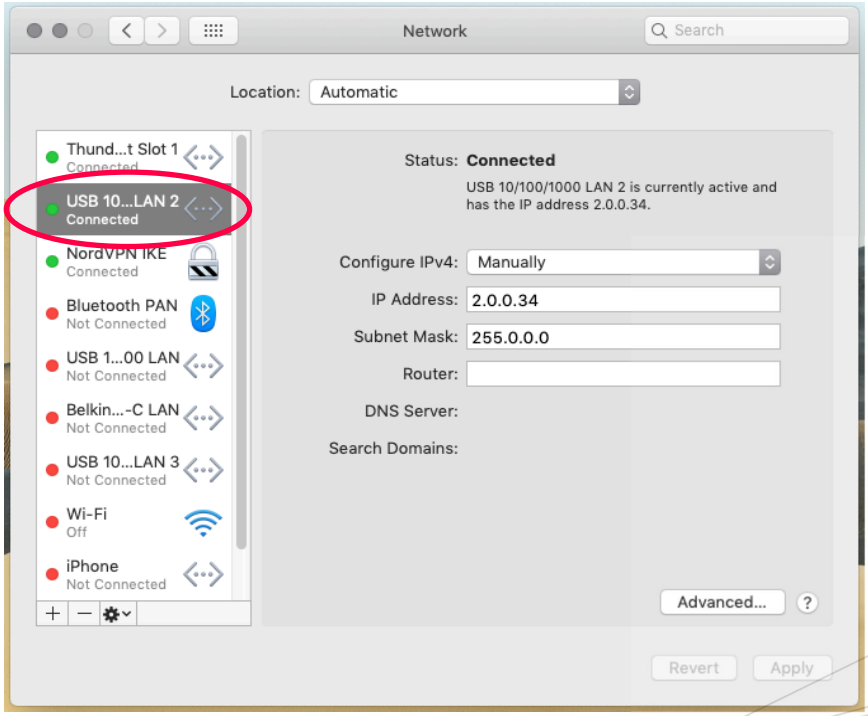
-The following steps detail the process of connecting via a computer using the wired network interface instead of the wireless network.

Network configuration in macOS

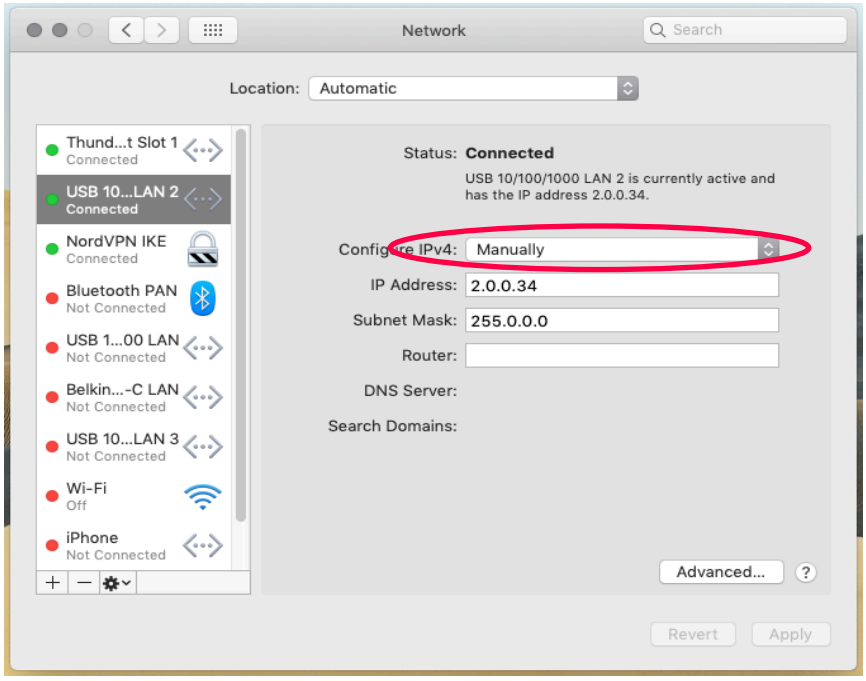
1 Access the System Preferences and then select "Network".



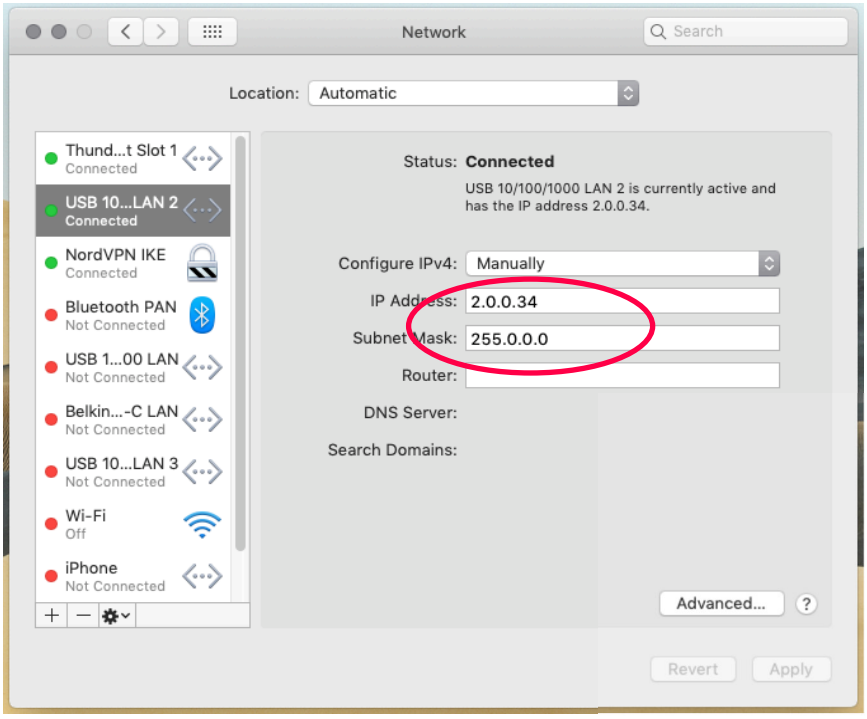
2 From the left side menu select the network interface to which the lightShark device is connected.



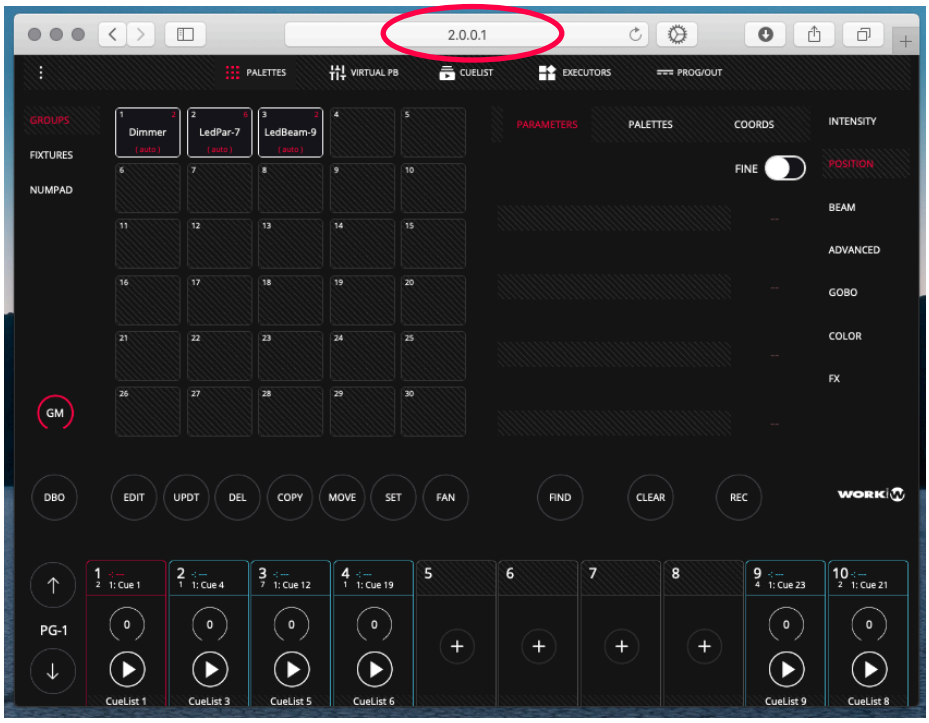
3 Then set the interface to "**Manually**".



4 Then set the IP address and Subnet Mask as in the following example:

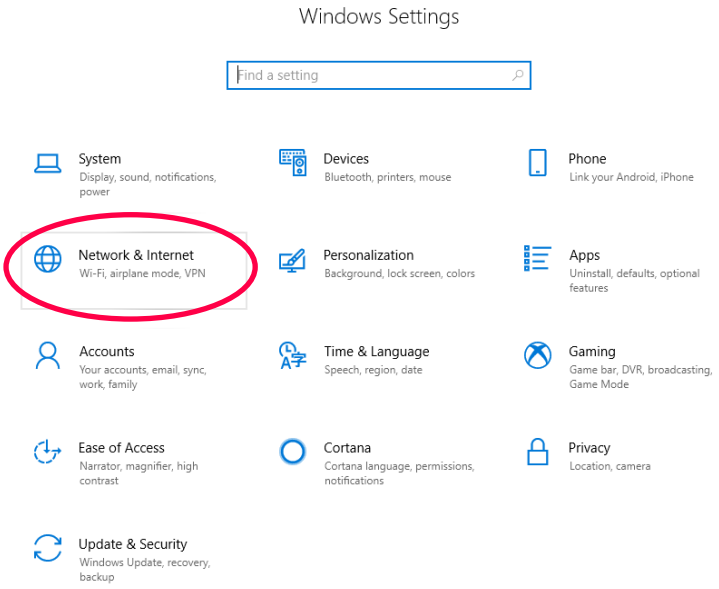


5 Start Safari and enter the address : 2.0.0.1

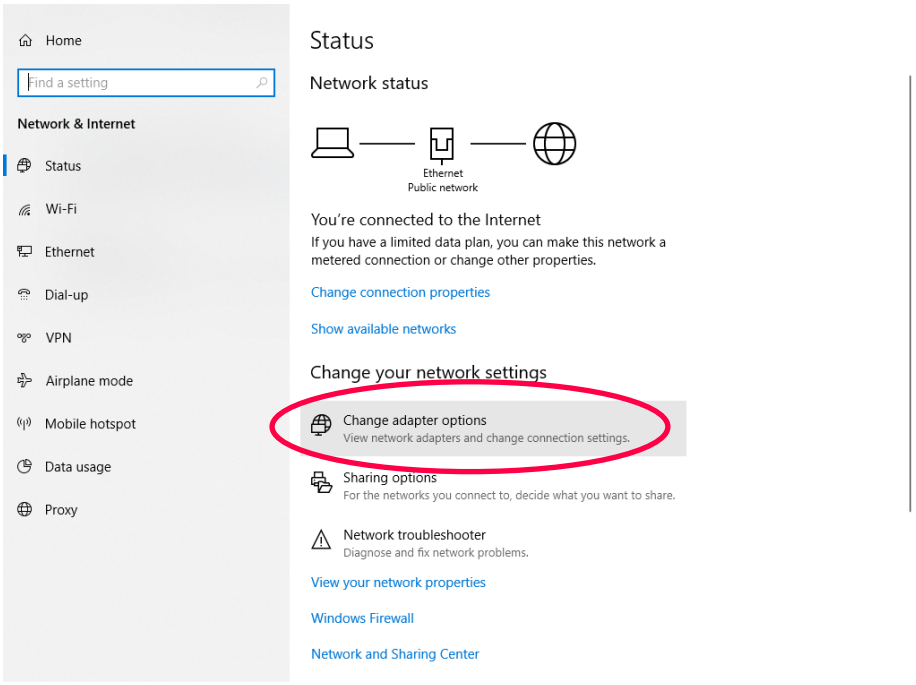


Network configuration in Windows10

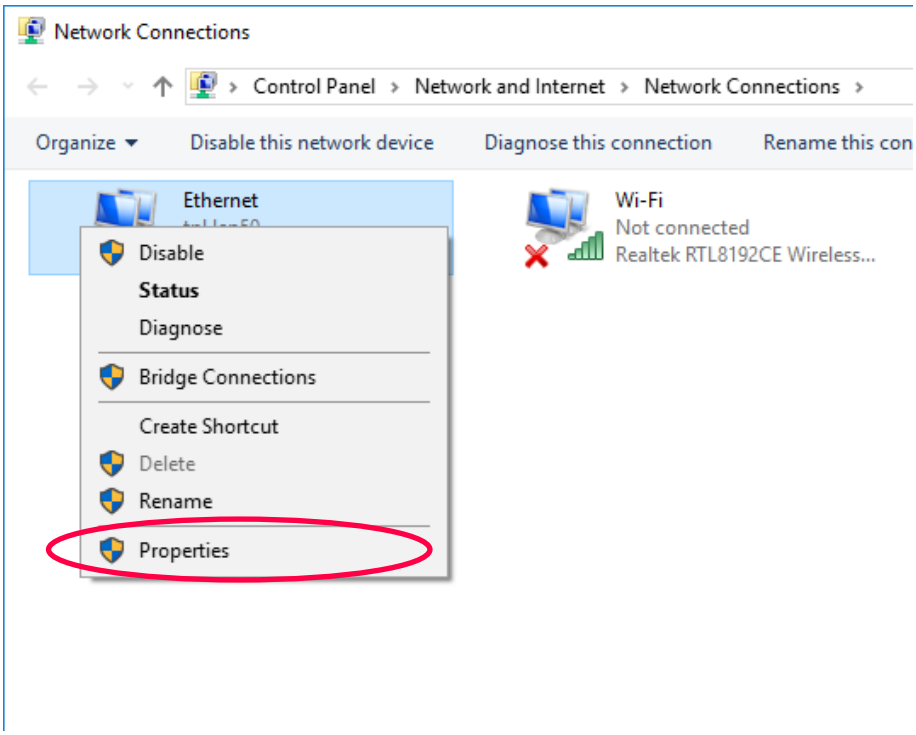
1 Access the Windows Settings and then select "Network and Internet".



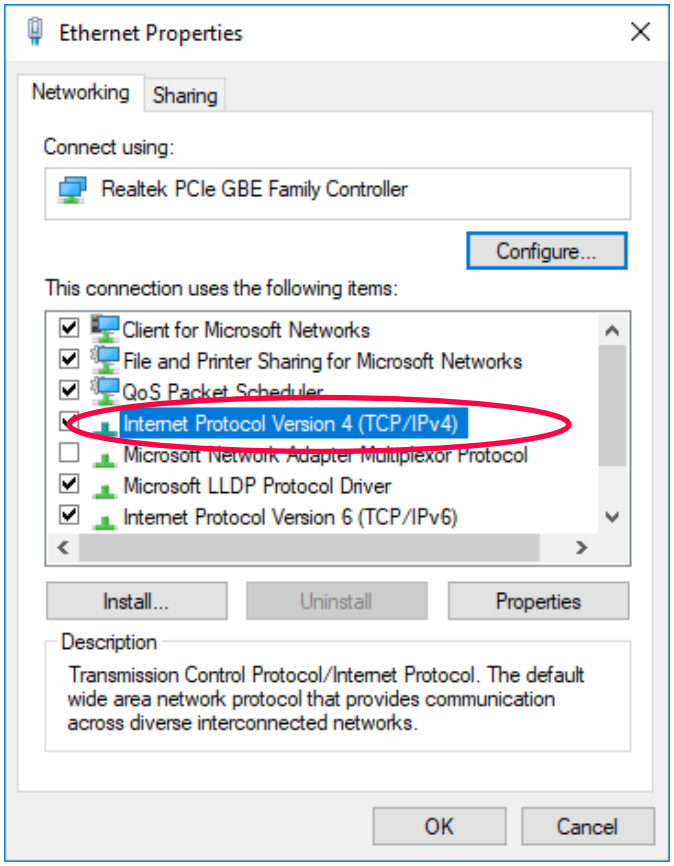
2 Select the "Change Adapter Options" option.



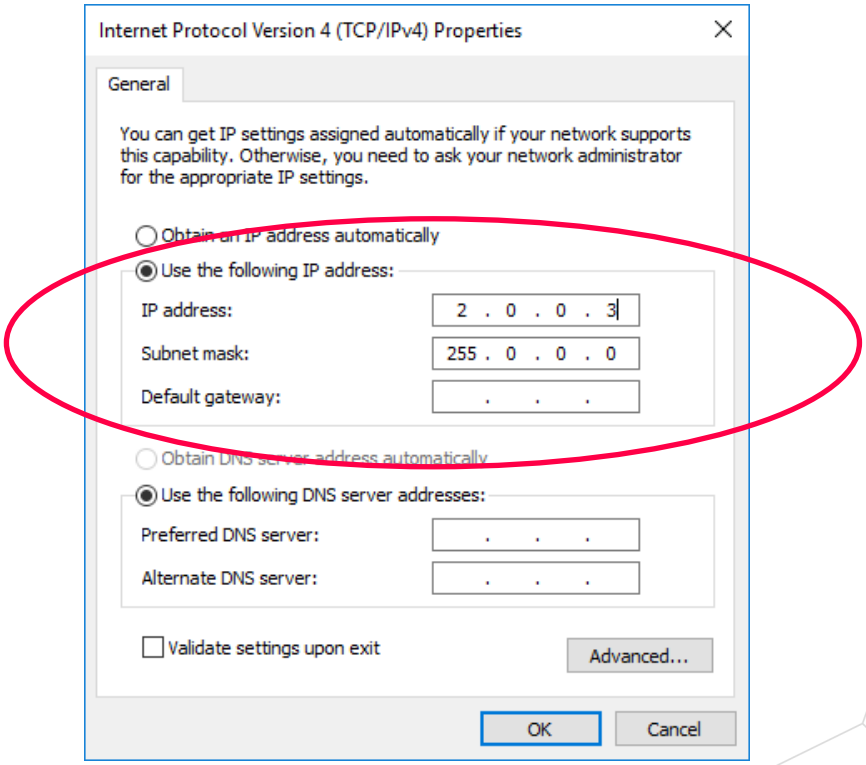
3 Right click on the network interface to which lightShark is connected, then select "Properties".



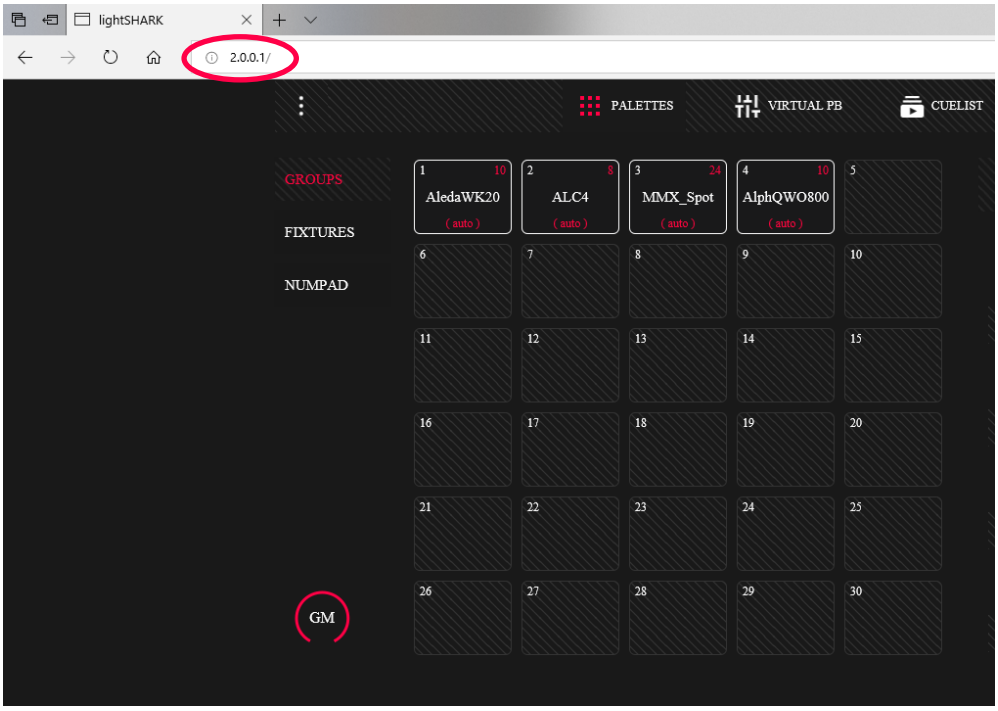
4 Then "Double click" on "Internet Protocol version 4 (TCP/IPv4)".



5 Enter the network configuration as shown in the following example and accept the changes:

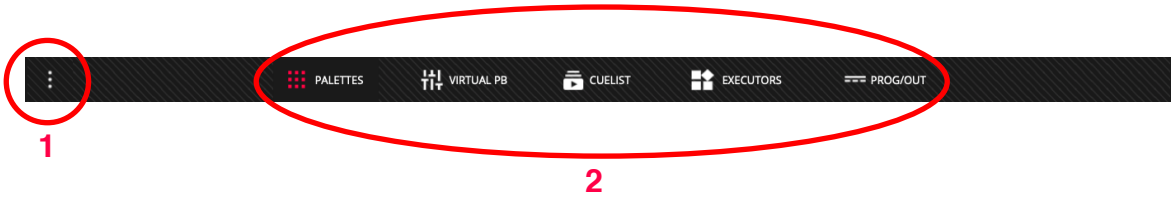


6 Start your web browser and enter the address "2.0.0.1" as shown below:



2.4 LightShark graphical user interface

LightShark has a simple but complete user interface, from which the user can control all the parameters of the fixtures, record scenes and perform shows. The interface is organized with 5 different views and a menu button:

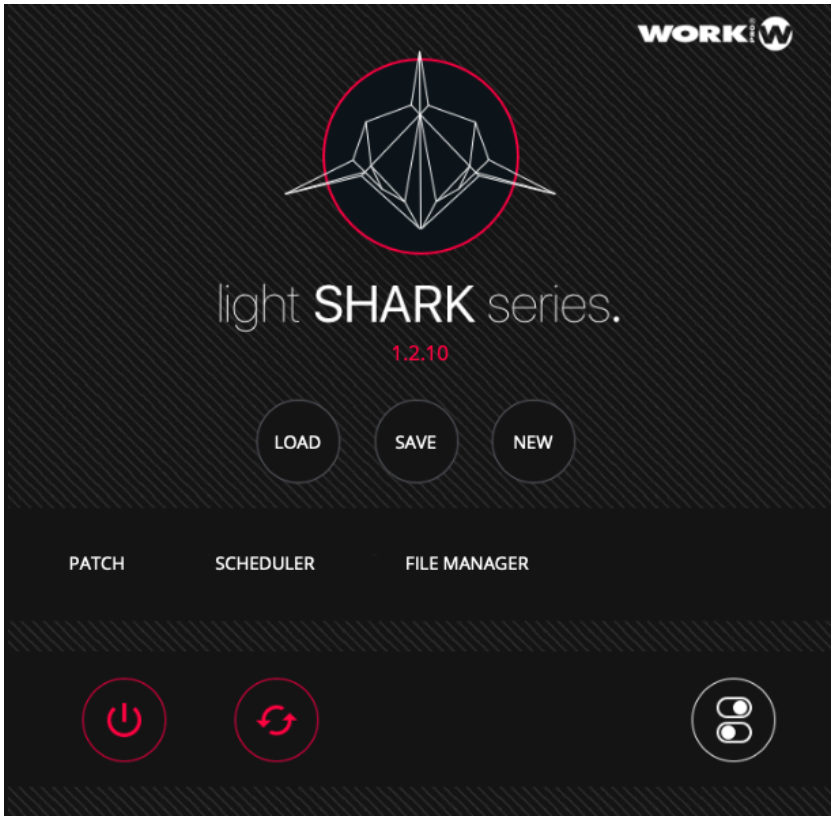


1 Access to the Options Menu/Main Menu.

2 Access to the different views of the interface.

MAIN MENU

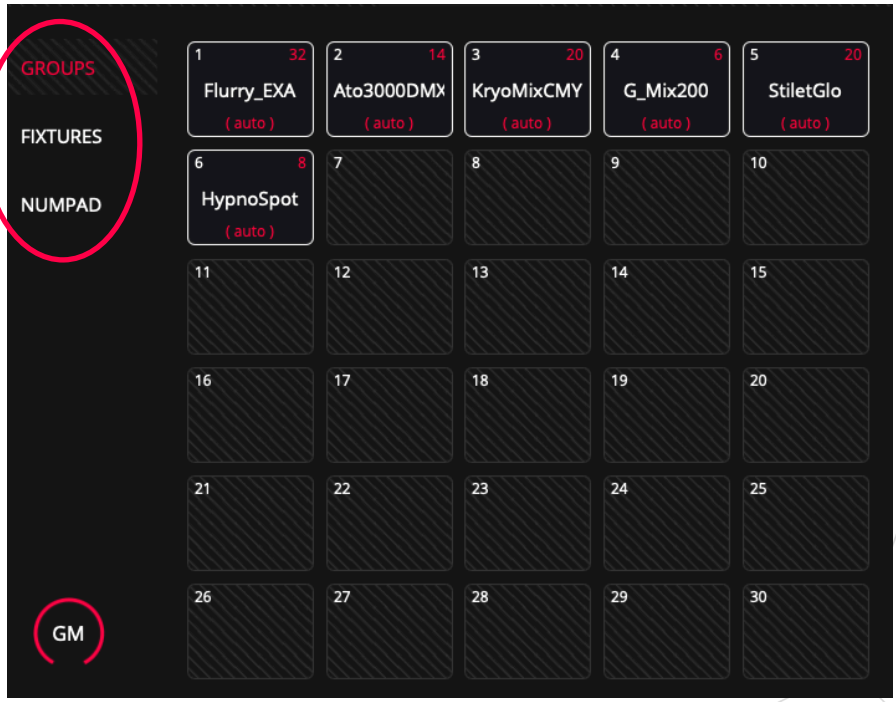
The lightShark Options Menu can be accessed from the icon in the upper left corner.



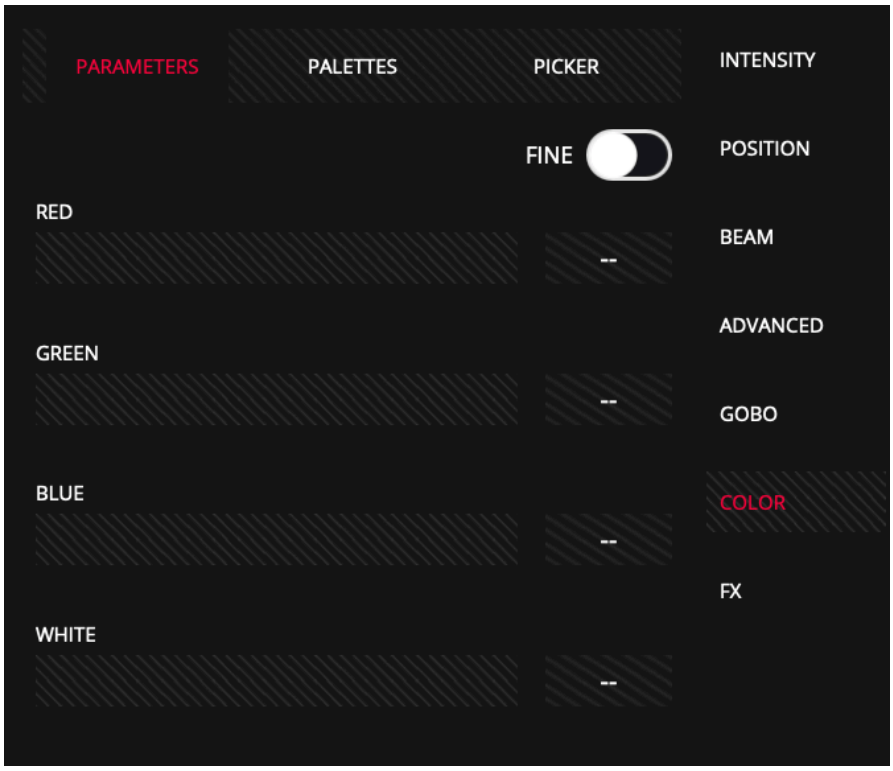
PALLETES WINDOW

This is the main view of LightShark. From this window the user can select and control the fixtures, as well as record scenes or edit elements. The Palettes window is divided into 4 sections:

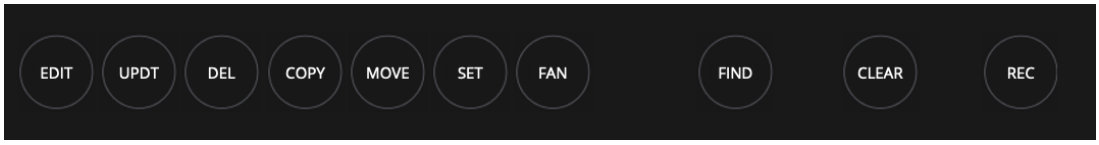
1 Fixture selection area: You can select the fixtures through groups, individually or through the numeric keypad.



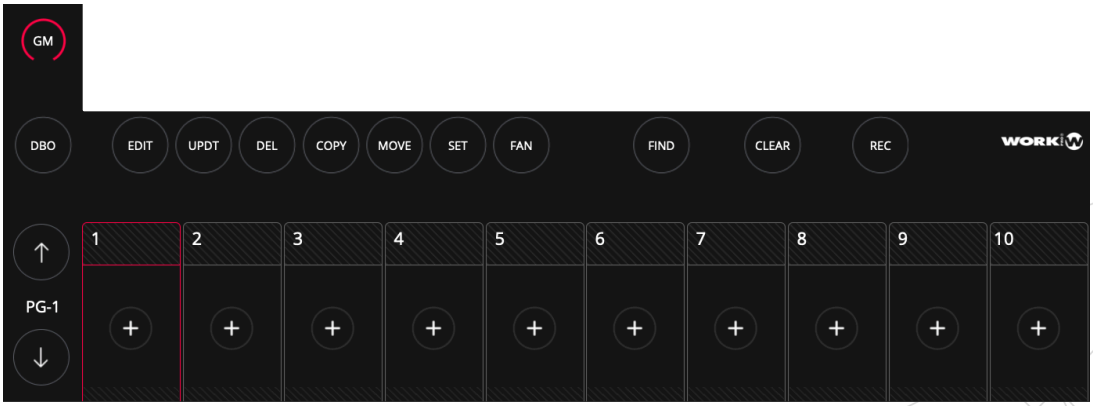
2 Parameter control area: This is where you can modify selected fixture's attributes. Depending on the type of parameter and selected fixtures, you may see different information.



3 Editing Zone, allows the user to perform the functions related to editing and recording.

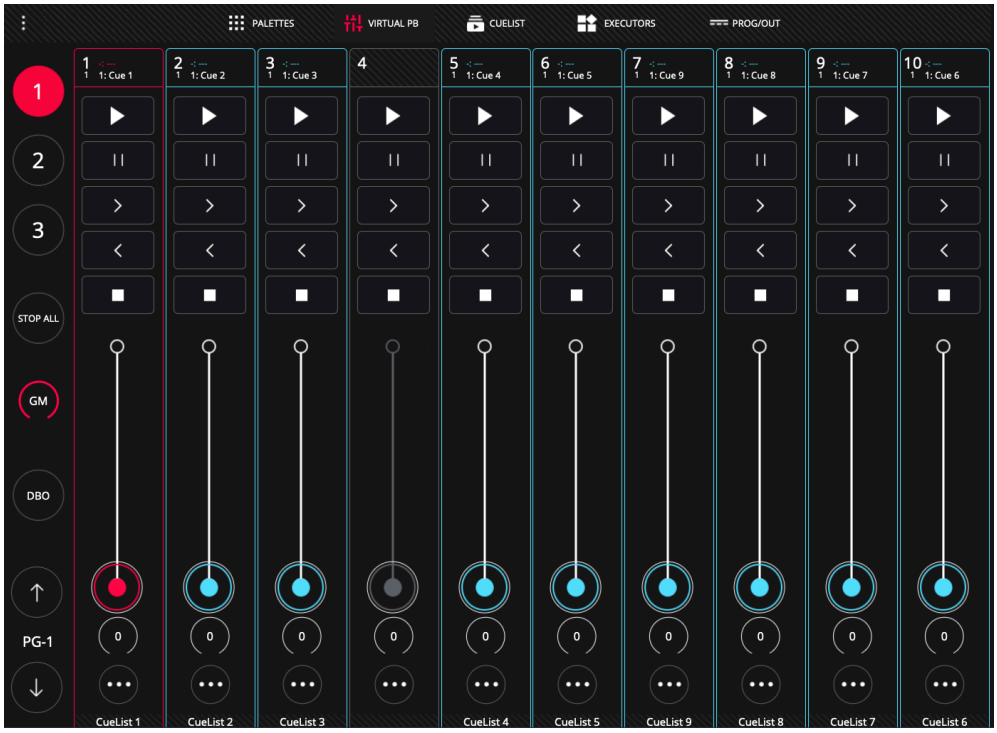


4 Playbacks Zone, allows the user to control the playback of the show, trigger the Cuelist and control the output level.

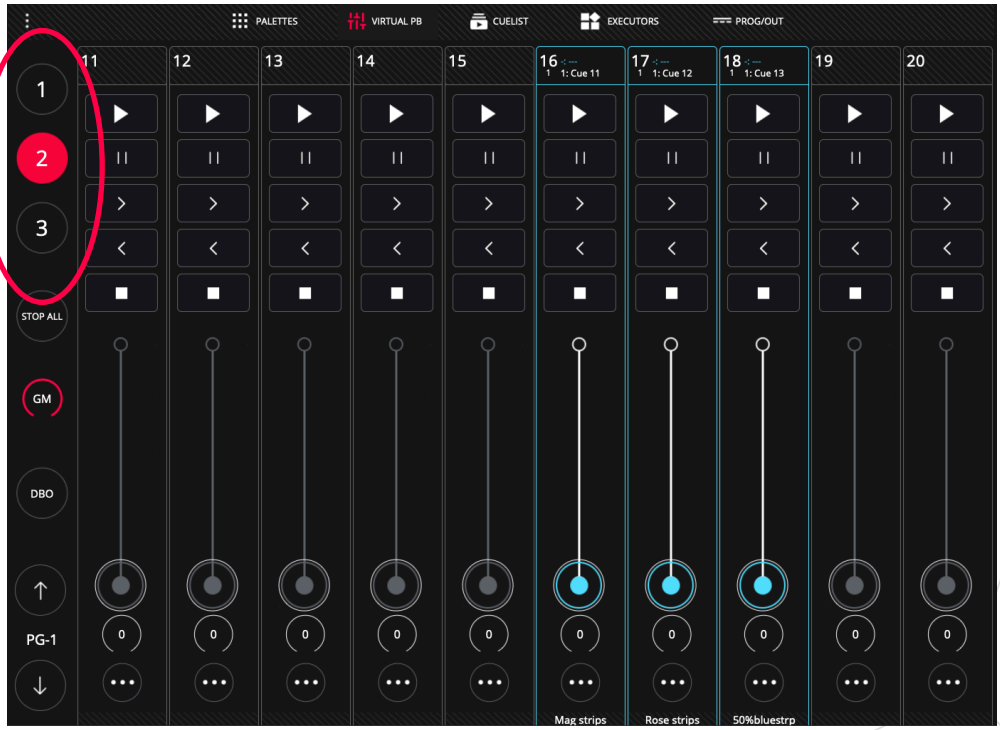


VIRTUAL WINDOW PLAYBACKS

From the "Virtual PlayBacks" view the user has access to the Playbacks. This is very useful when using a LS-Core or when no physical control surface is available.

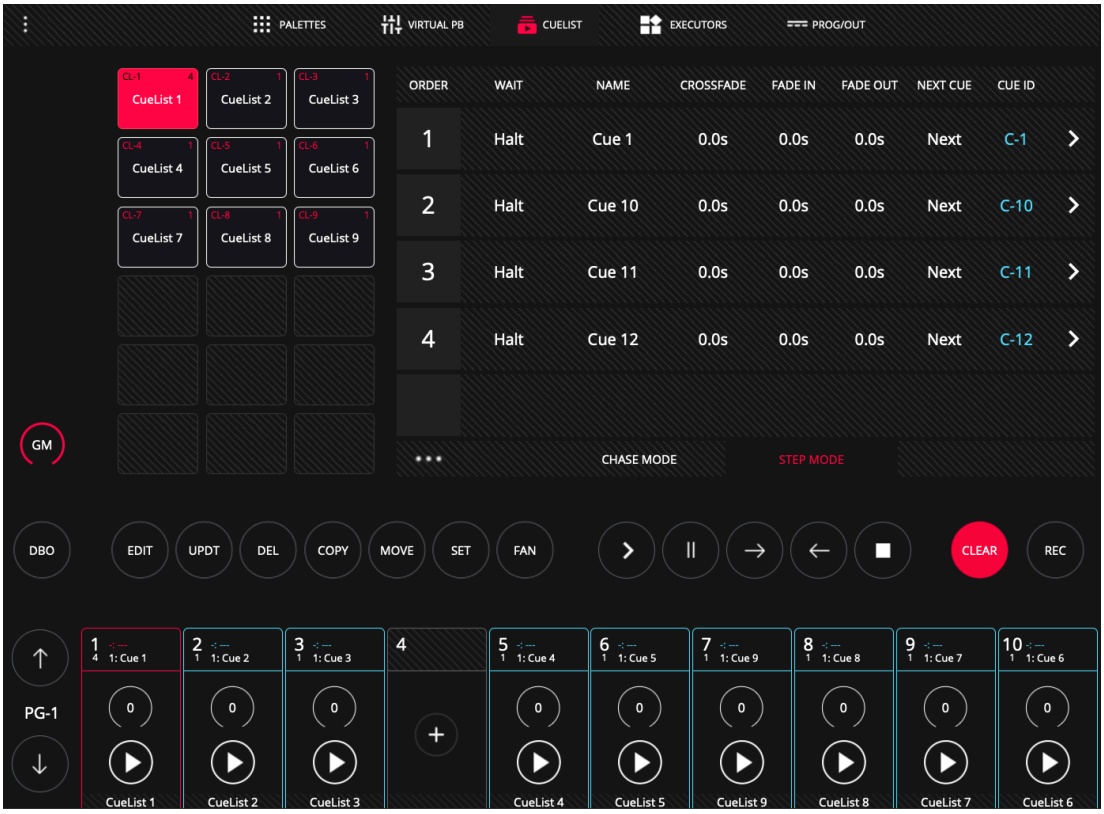


LightShark's interface is multi-touch, so you can operate multiple Playbacks simultaneously from one tablet or device. From the side buttons 1, 2, and 3 the user can directly access the desired Wing without scrolling.



WINDOW CUELIST

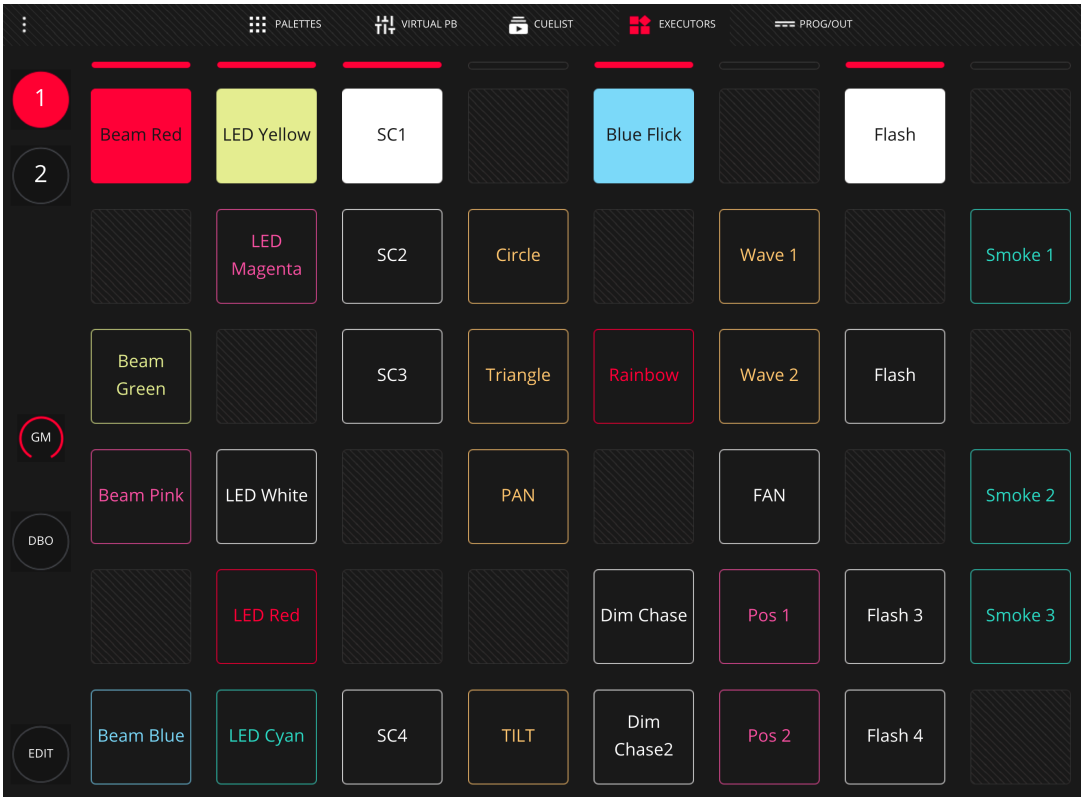
LightShark has a Cuelist manager where you can navigate between all stored Cuelist and Cues:



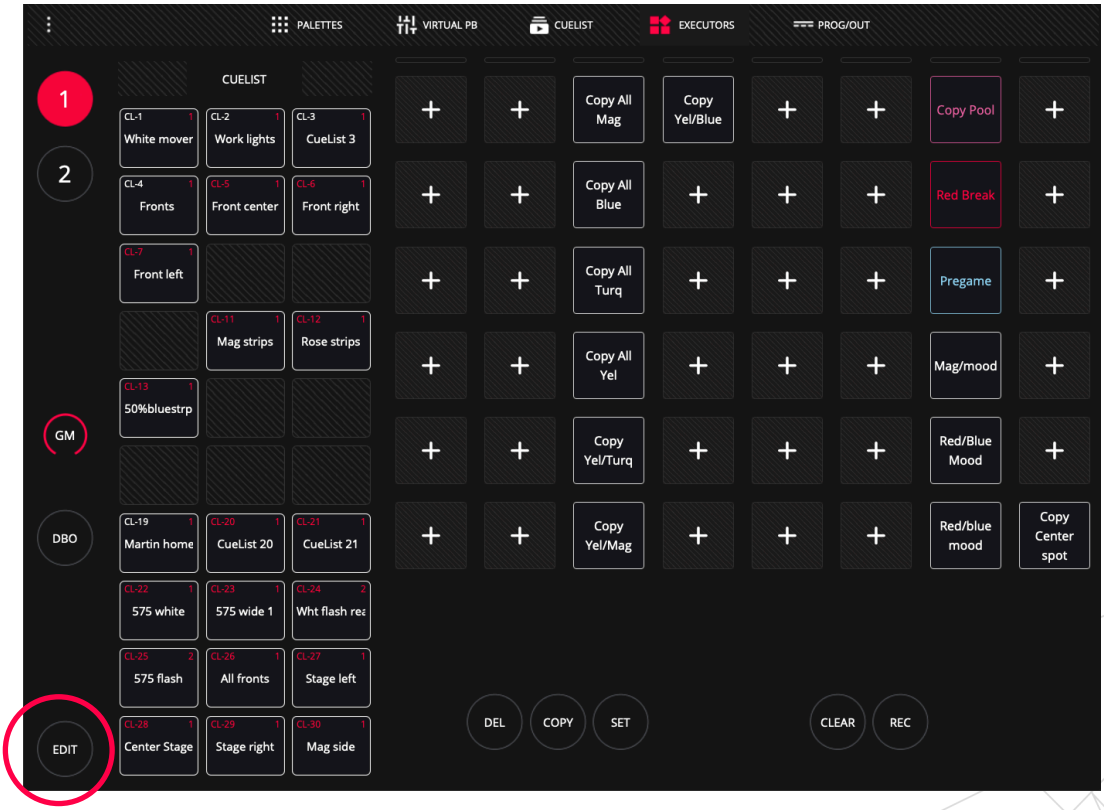
From the playbacks it is possible to directly access the cuelist on that playback via a "double click" on the top of the Playback.

EXECUTORS WINDOW

The "Executor" Window is a special user configurable window where you can add Cuelists and configure their behavior.

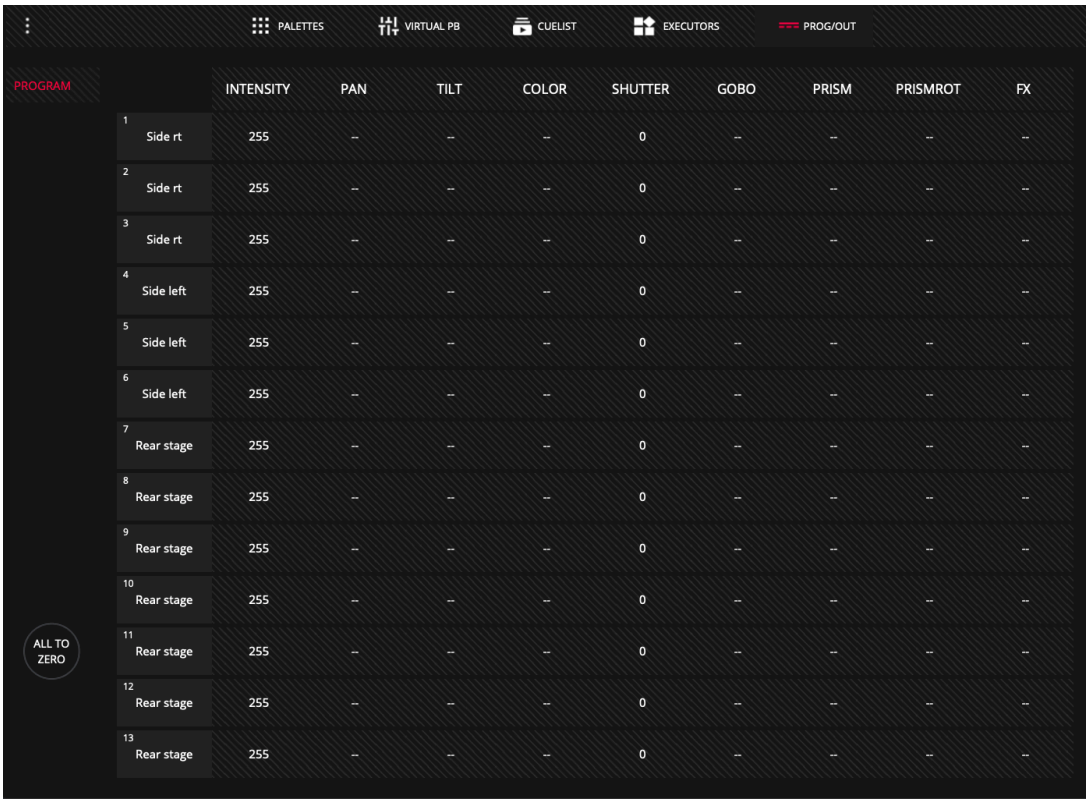


To configure the window of executors press the “EDIT” button.



PROGRAMMER WINDOW

From this window it is possible to see the information in the programmer.



Fixtures are sorted according to the order of selection. The information shown in this window is the information that will be saved in the Cue if recorded at that moment.

2.5 Common Actions

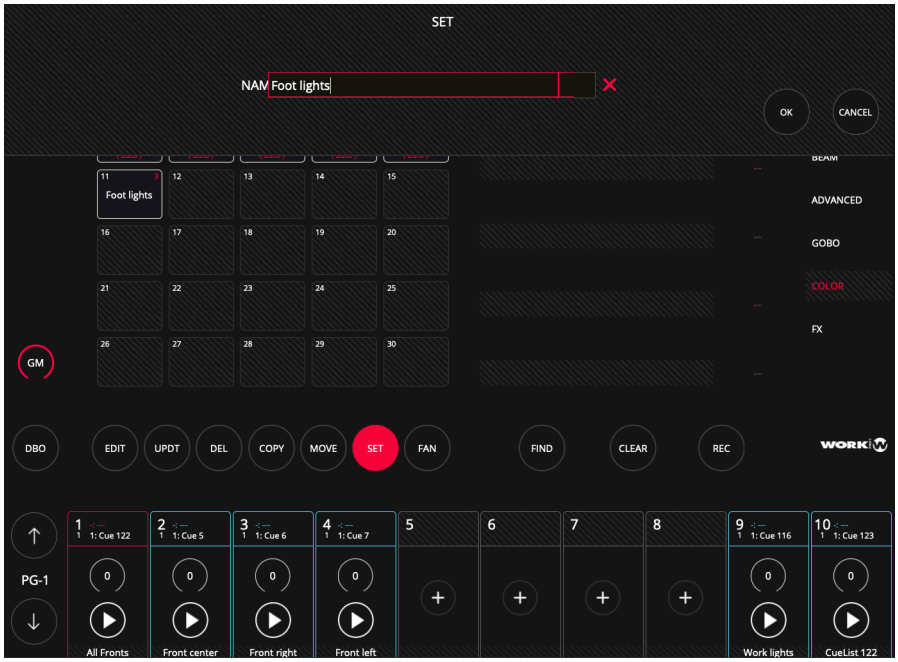
LightShark has a number of common actions that can be used throughout the entire interface.

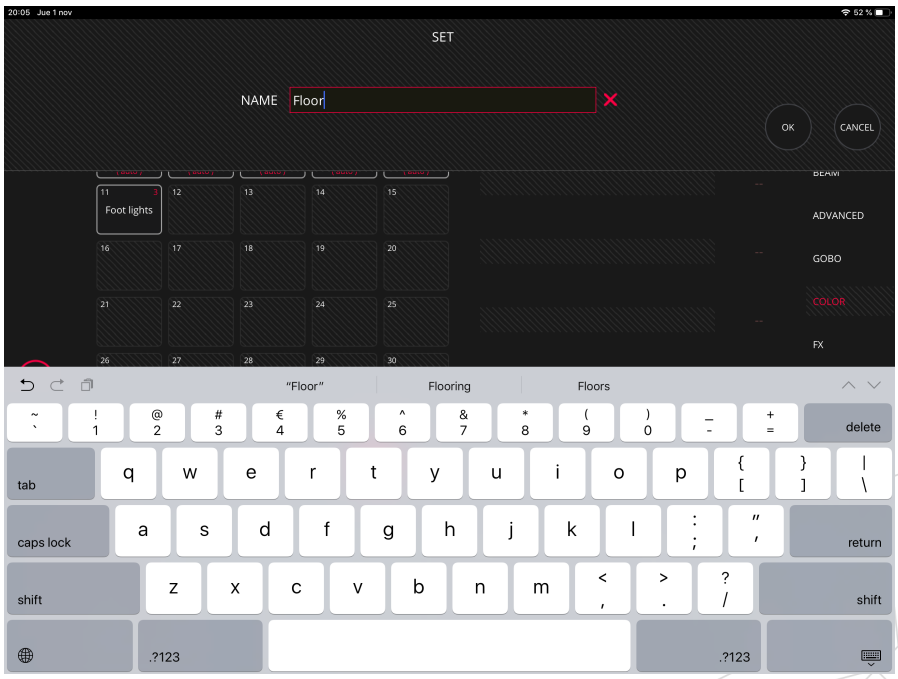
Naming Elements, it is possible to change the name of groups, fixtures, Cues, etc. This can be done in two different ways:

1 Using the "SET" key:

Press "SET".

Select the item to be renamed





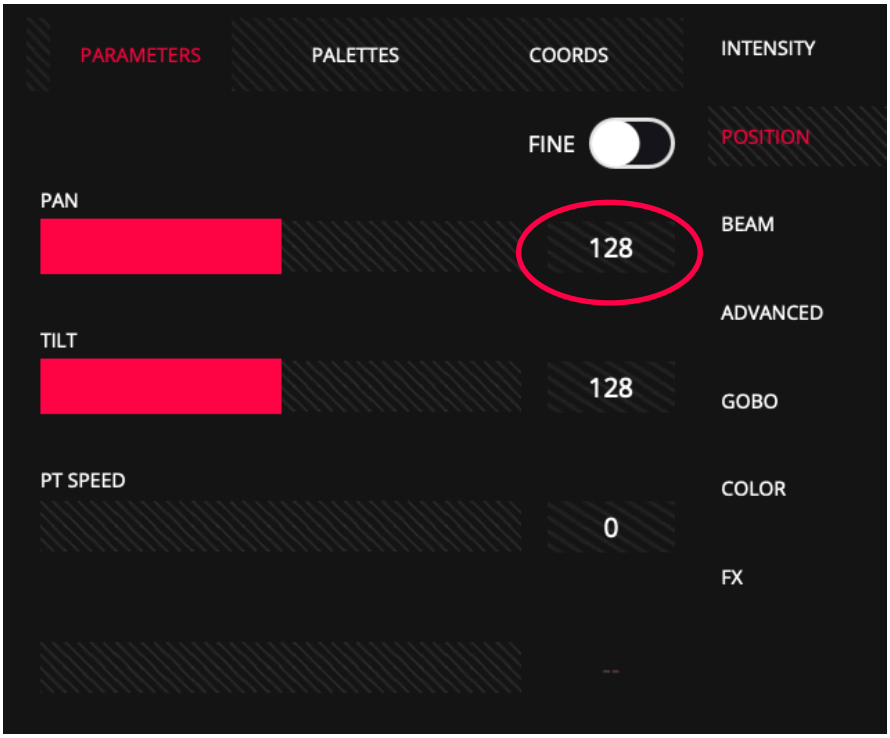
2 Press and hold down for 2 seconds on the name to rename the element.

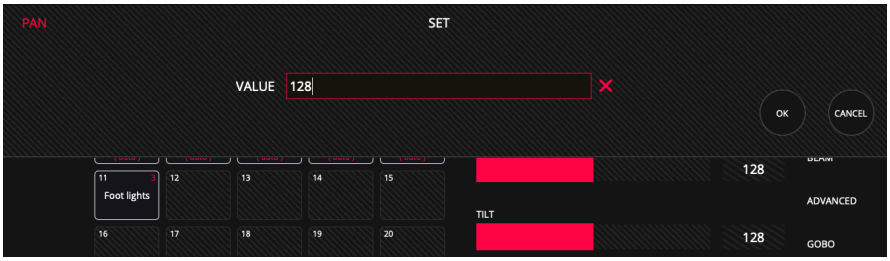
Adjusting levels. It is possible to adjust levels or to adjust the values of the numerical fields ... This can be done in two different ways:

1 Using the "SET" key:

Press "SET".

Select the item to be adjusted.





2 Press and hold on the value you wish to change for 2 seconds to rename the element.

Moving Elements: it is possible to move elements between different positions:

Select the element you want to move

Press "MOVE."

Select where you want to move.

Coping Items: you can create a copy of an item:

Select the item you want to copy

Press "COPY."

Selects where to leave the copied item.

Deleting Elements: it is possible to delete different elements (Groups, Cues, Executors...):

Press "DEL".

Select the item you want to delete.

Quick selection of elements: it is possible to select multiple elements at once:

Selects the first element

Click twice in a row on the last element.

This will automatically select all items between the first and last selected item.

Recording: It is possible to save elements inside the box type buttons (Groups, Cues, Palettes...):

Once you are ready to save, press "REC".

Click on the destination button.

2.6 Programmer

All show information storage is carried out by the programmer and lightShark uses this information when recording Playbacks, palettes, and groups. The programmer has priority over all PlayBacks, Cues, Cuelist and channels. A fixture is included in the programmer when any attribute is modified.

The CLEAR button illuminates when there is information inside the programmer. Press the "CLEAR" button to erase the information inside the programmer and all channels will be removed from the programmer. The HTP channels will be reset. It is possible to change the behavior of "CLEAR" from the main menu by choosing to return all channels to 0 or to the default value defined in the library.

If, after selecting a fixture (or group of fixtures), the "FIND" button is pressed, all the attributes of the fixture will be included in the programmer with the levels defined in the fixture profile.

The programmer window allows the user to see what is in the programmer and how it is configured. The programmer window can be accessed from the upper window bar.

HTP and LTP channels

To understand how lightShark works it is necessary to know the different types of channels there are:

HTP stands for “Highest Takes Precedence”. This means that whatever fader has a particular light at the highest intensity, wins.

The limitation of this, however, is that you can’t just “grab” a light’s fader and bring it down to get it to zero. If that light is recorded anywhere else in the console, and that fader or cue is up, you can’t bring the light down!

It’s all about “priority” Priority is necessary because modern lighting console can bring up a particular light or parameter in multiple places within the console. It is then up to priority to decide which place in the console wins- and what you see on stage from the console’s output.

HTP and LTP are the 2 main “systems” for determining priority.

HTP is great for conventional lighting because you don’t really have a need control any other parameter besides intensity- which has a definite higher and lower.

When you move into the world of moving lights and LED’s, however, you need to control parameters such as color wheels, gobo spin, and frost. These parameters don’t have a higher or lower setting- green is not greater than orange, nor is orange greater than green! That brings us to LTP.

LTP stands for latest takes precedence.

This means that the most recent fader, cue or button touch wins- no matter which light is higher. This means, that when you touch that play button, the exact cue you played, will play exactly as it is recorded.

However, it is important to note that if a cue has no information recorded for a specific light or parameter, it will not alter that light or parameter if it is live. This is a concept called "Tracking".

Because the cue you've now played has taken precedence, you need to re-assert, or playback the first cue if you want to see it again on stage, because LTP is more concerned about playing new looks than going back into old looks when you bring the fader down.

If a look is completely over-ridden, your console may force release it to help you when you choose to bring down your faders!

So next time you're on that show, captaining that new professional-grade console, remember to always hit clear to release the programmer and to be careful what you record into cues with a "0"- the latest will always take precedence, whether you like it or not!

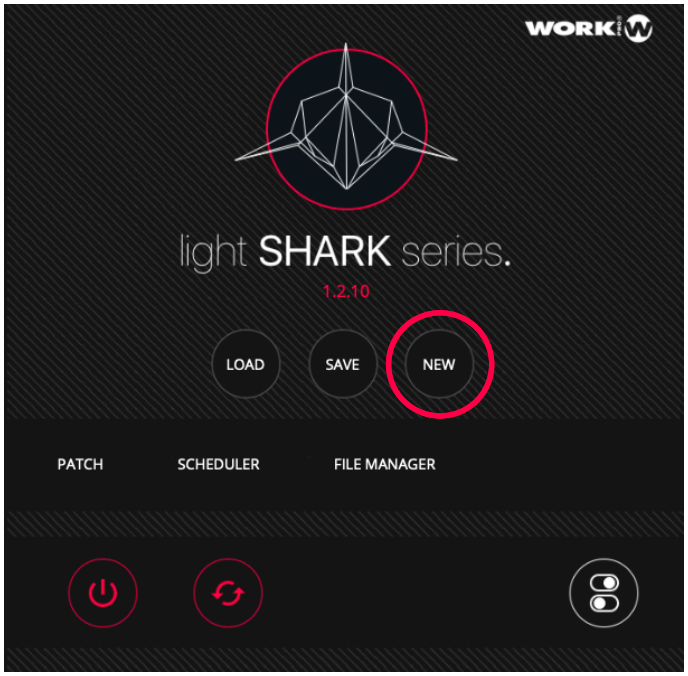
Be sure to think carefully and work intentionally, especially the first few times you program a show in LTP if you come from the HTP world. It's a lot different, but when working with moving lights, it's a whole lot better and easier.

David Henry
Learn Stage Lighting
https://www.learnstagelighting.com/what-is-htp-what-is-ltp-why-should-i-care/

Section 3: LightShark Basics

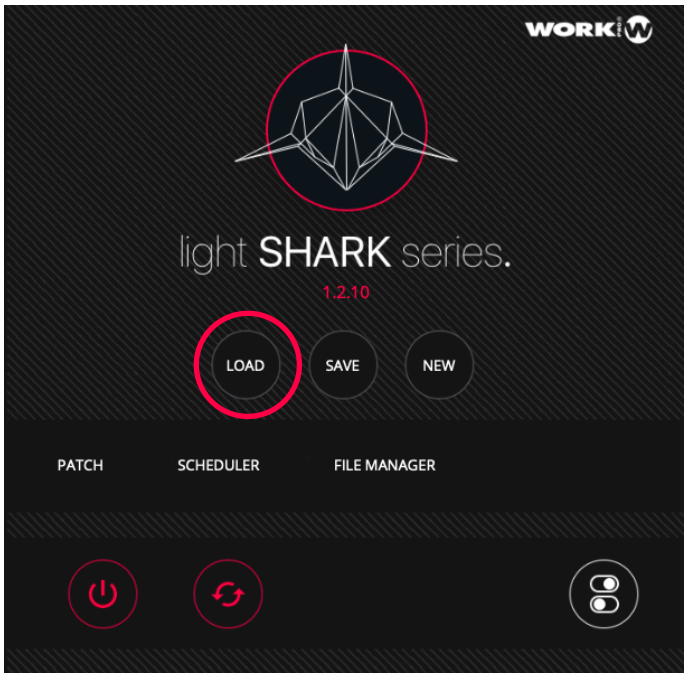
3.1 Management of Show Files

To create a new show from scratch, access the LightShark menu through the icon located in the upper right corner and press the "NEW" button.

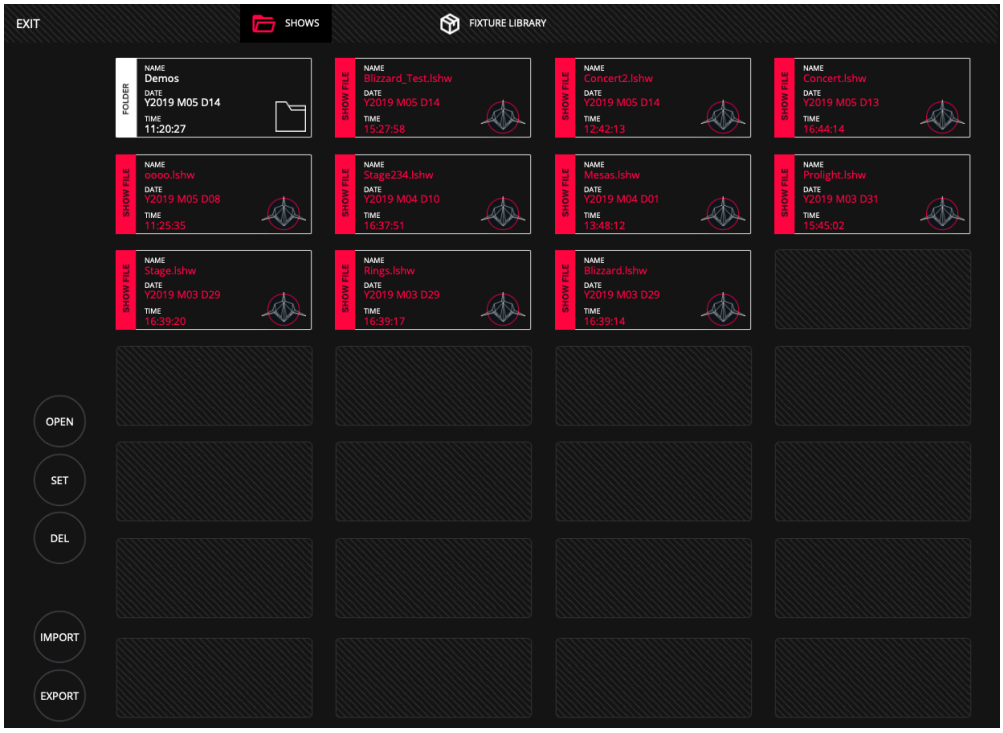


LightShark incorporates a file manager from which it is possible to load, copy, save, delete and rename files. To load an existing show:

1 Access the LightShark menu through the icon located in the upper right corner and press the "LOAD" button.



2 LightShark will open the file manager where you can find all the files stored in the console. “Double click” on the show you want to run.



In each of the show file icons you can find information about the name of the show, creation date and time.

To save a show at any time:

1 Access the LightShark menu through the icon in the upper right corner and press the "SAVE" button.

2 LightShark will display an on-screen keyboard where you can enter the name of the show. If you want to overwrite the file simply press "OK".

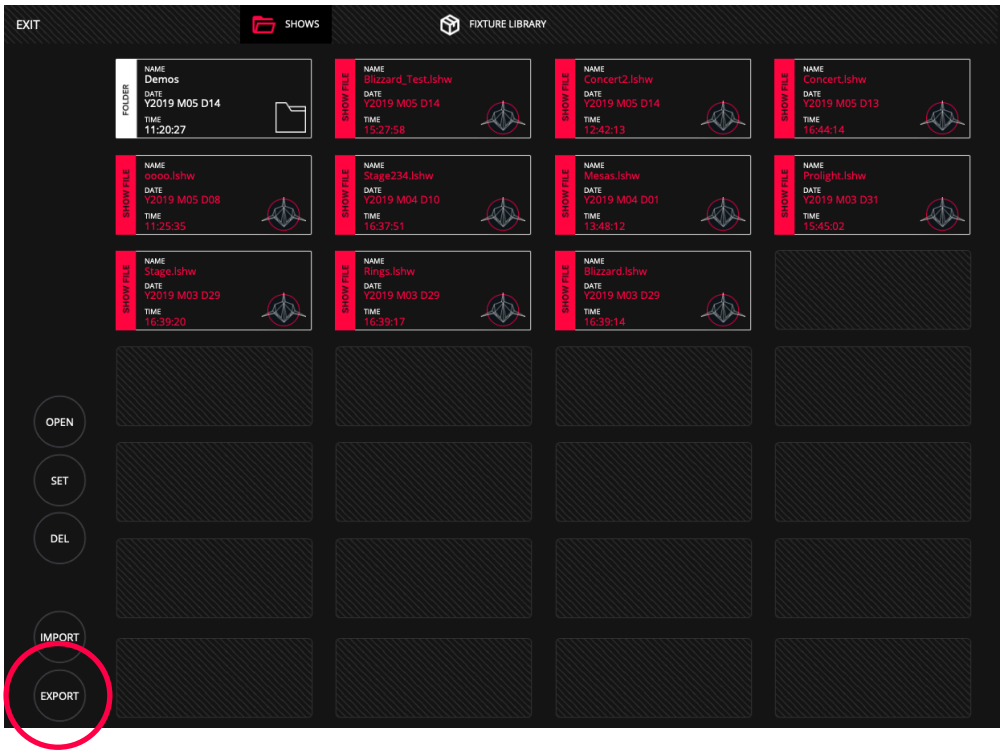
Note

The current version (R1) does not incorporate an auto-save function, it is recommended that the user save the changes from time to time. The auto save function will be implemented in next software updates.

It is possible to share LightShark show files between consoles or LS-Core:

1 Access the LightShark menu through the icon located in the upper left corner, press the "File Manager" button and select the upper "Shows" tab.

2 Select the show you want to export and press the "Export" button. LightShark will copy the show file to the external USB memory.



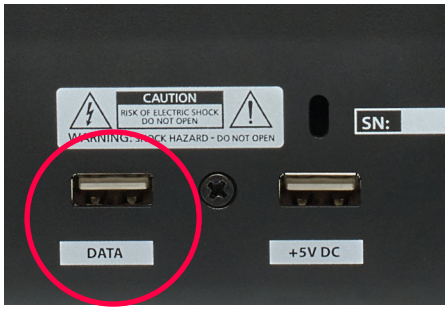
You can delete any show as follows:

1 Access the LightShark menu through the icon located in the upper left corner, press the "File Manager" button and select the upper "Shows" tab.

2 Press the "DEL" button and then select the show file you want to delete.

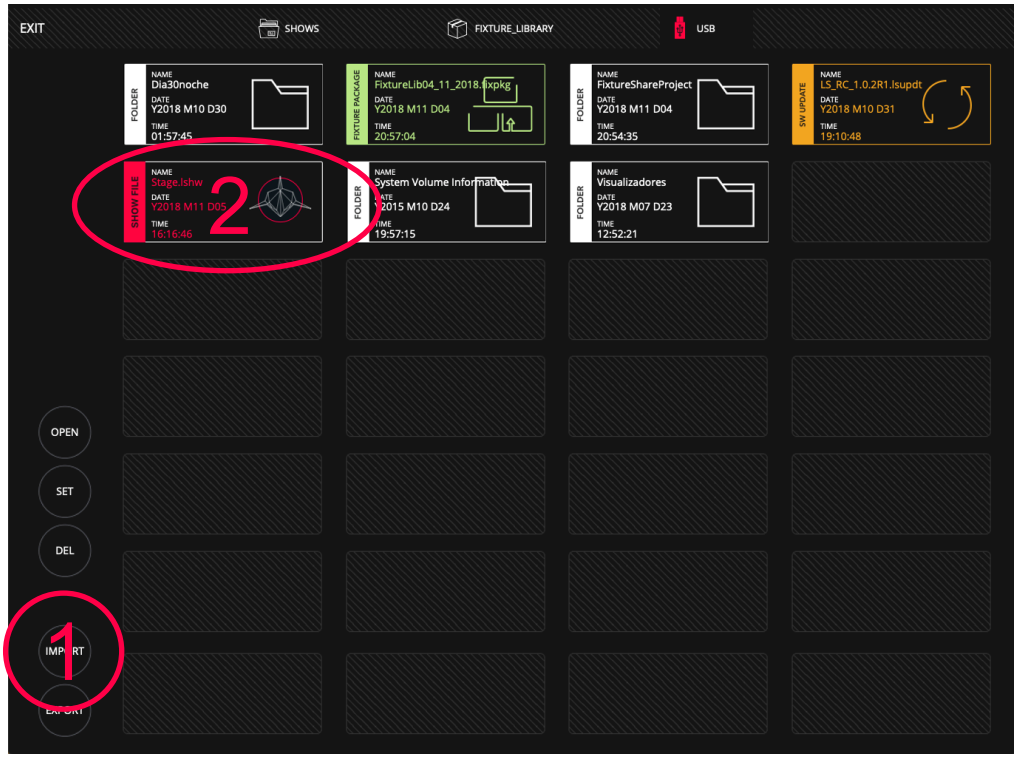
You can import a show file that was created from another lightShark device:

1 Connect the USB stick containing the show file you want to import to the USB port labeled "Data" (on the LS-1) or to the front USB port labeled "Host" (on the LS-Core).



2 Access the lightShark menu through the icon located in the upper left corner, press the "File Manager" button and select the upper "USB" tab. Note that this tab is only displayed if a USB stick has been connected.

3 Press the "IMPORT" button and then select the show file you want to import.



3.2 DMX OUTPUT

LightShark offers a maximum of 8 DMX universes. Both LS-Core and LS-1 have 2 physical DMX output universes.

The LS-1 console offers support for XLR-3 and XLR-5 connectors, however, please only use 1 of each output's connectors at a time.

The LS-Core device has 2 XLR-5 connectors.

The other DMX universes are emitted using different network protocols through the ethernet connection. LightShark does not emit DMX signal over WiFi.

LS-1

LS-Core

The network protocols supported by lightShark are:

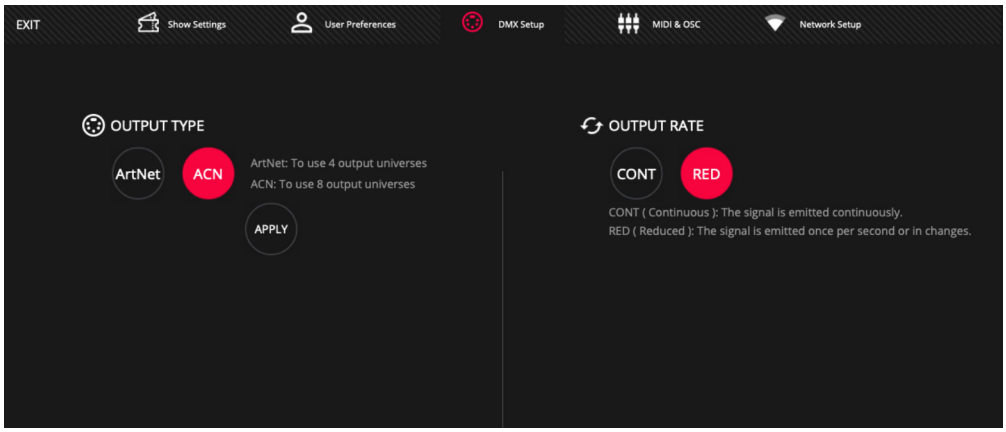
Art-Net is a free communications protocol for the transmission of the DMX512-A lighting control protocol via UDP. It is used for communication between "nodes" and a "server".

sACN is a set of network protocols for the control of entertainment technology equipment, especially when used in live performances or large-scale installations.

ACN was initially designed to be placed over UDP/IP and will therefore work over most IP networks.

You can adjust the output type through lightSharK's DMX configuration menu:

1 Access the lightShark menu through the icon located in the upper left corner, press the "Settings" button and select the upper "DMX Setup" tab.



2 In the "OUTPUT TYPE" section, select one of the 2 protocols:

Art-Net: Allows the use of up to 4 DMX output universes.

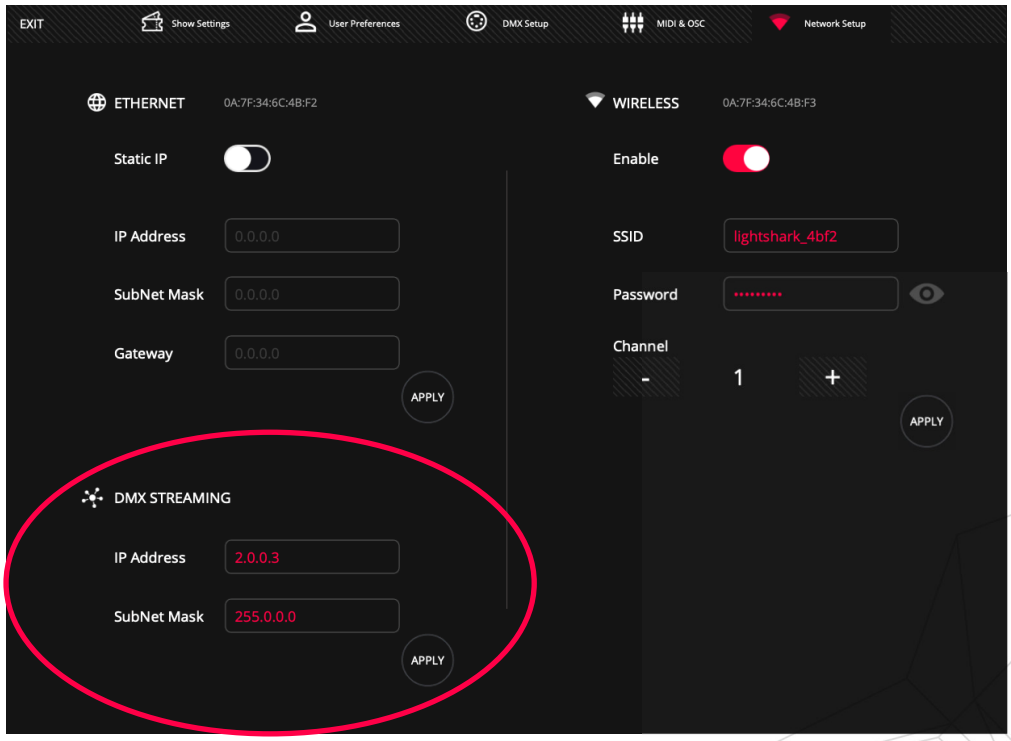
ACN: Allows the use of up to 8 DMX output universes.

By default lightShark is configured in Art-Net.

Through the "OUTPUT RATE" section you can configure the output frame rate, to improve compatibility with other devices.

You can adjust the network settings for DMX transmission via network from the "Network Setup" tab:

In the "DMX STREAMING" section, you can adjust the IP address and subnet mask so that lightShark can be configured in the same network as the other nodes and so that they can communicate with each other.



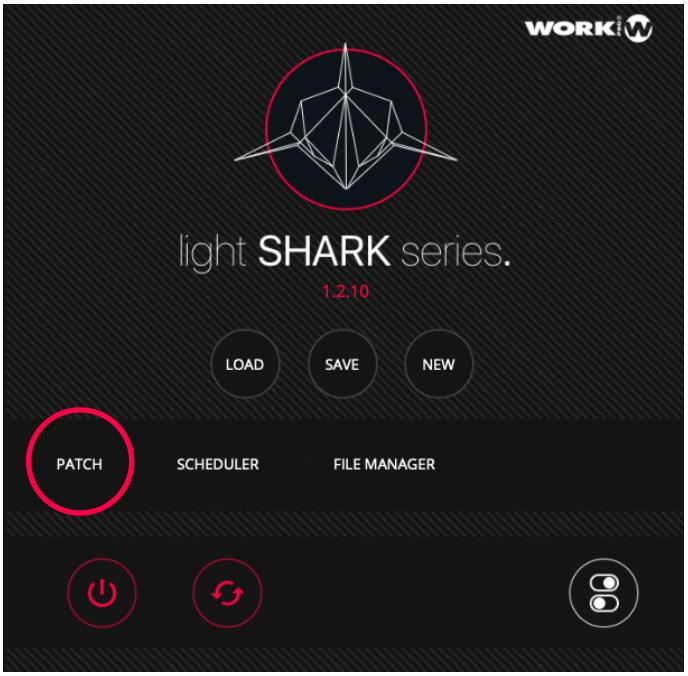
Once the necessary changes have been made, press the "APPLY" button to save the changes. LightShark will restart, loading the new settings at startup.

3.3 Adding fixtures to a show

LightShark assigns an ID to each of the fixtures added to the show, this way the fixtures can be selected through the keyboard, it is also possible to rename them to be identified quickly.

LightShark includes its own library of devices as well as a selection of generic profiles for those devices in common use (Dimmers, fog/haze machines, ParLed, etc), you can find them in the folder "Generic". The profiles created by the user are stored in the "User" folder.

1 Access the lightShark menu through the icon located in the upper left corner, press the "Patch" button.

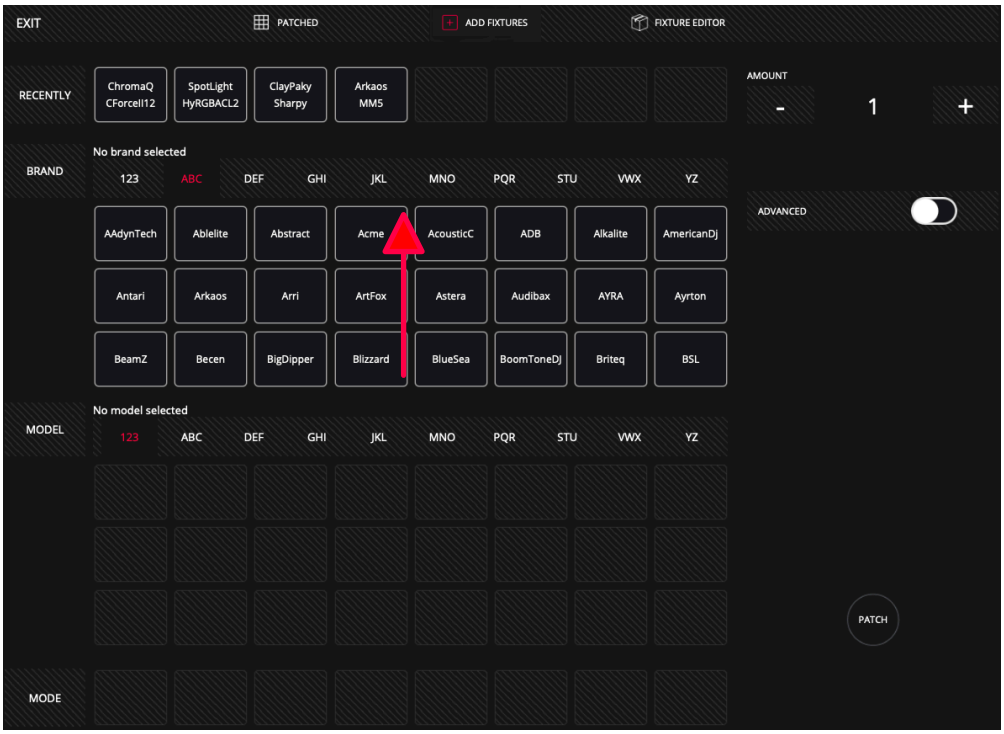


2 Select the top tab "ADD FIXTURES".

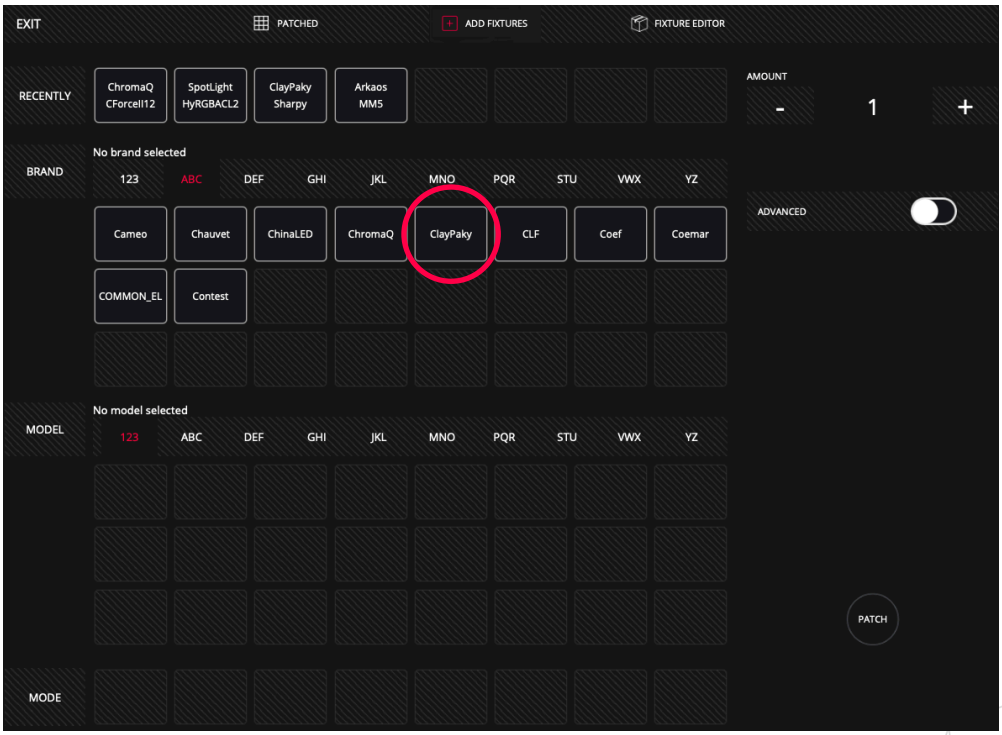
3 Select a manufacturer and then a fixture model and mode. You can see the manufacturers and models of fixtures are sorted alphabetically, making it easy for you to access and search.

It is possible to scroll vertically between fixture manufacturers or models.

Scroll vertically:

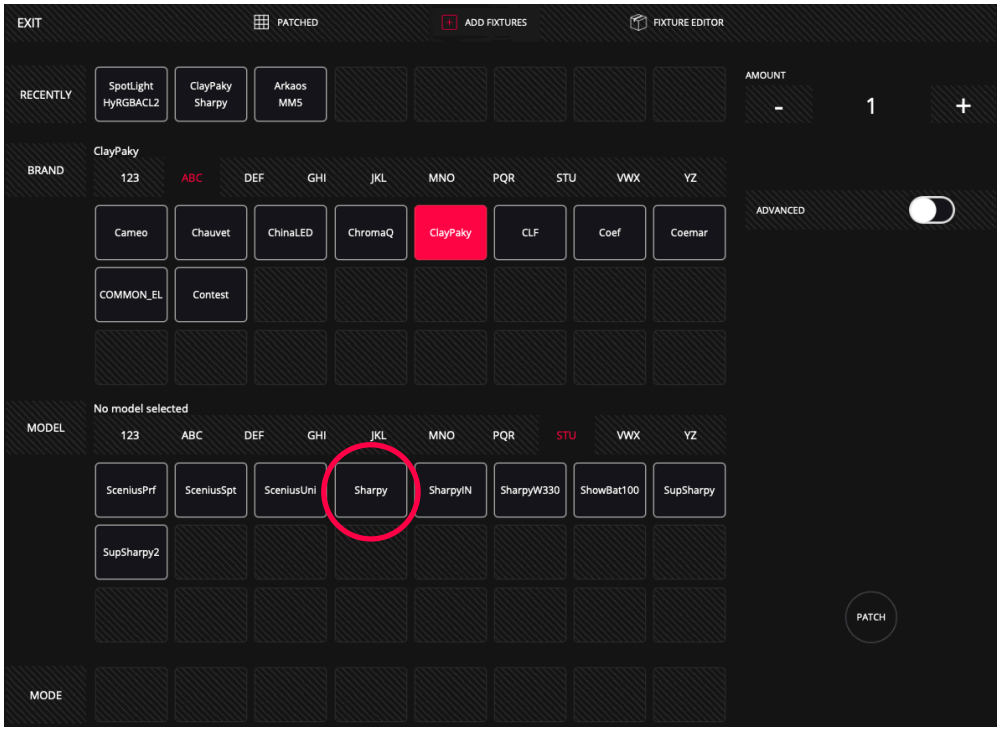


Select a manufacturer:

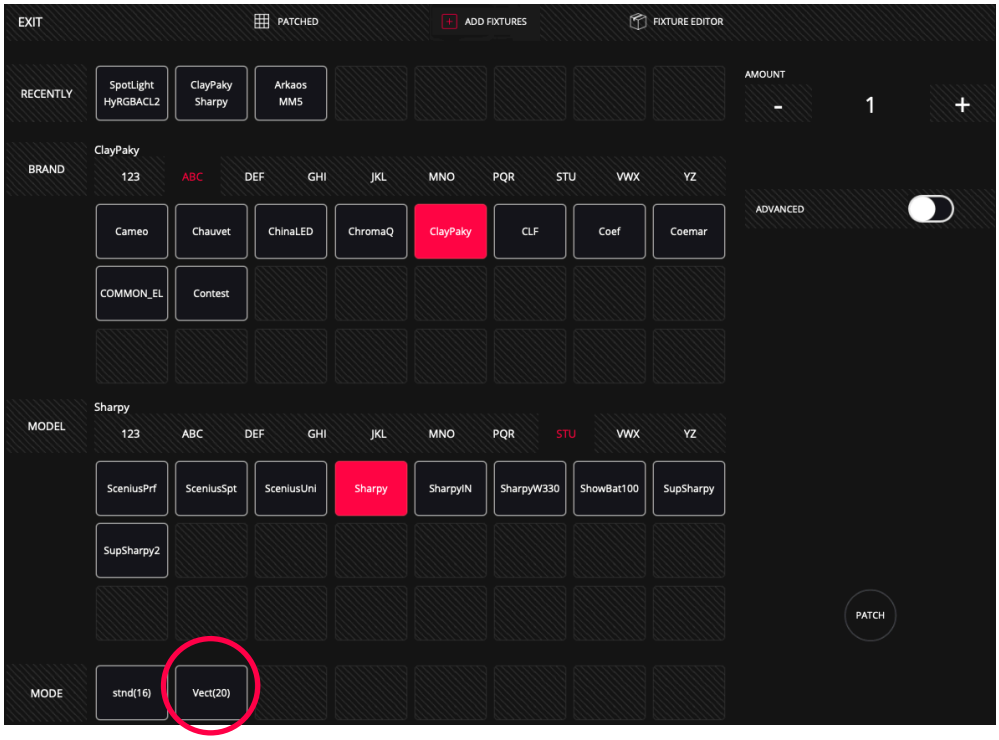


Selecting a manufacturer in the "MODEL" section will display that manufacturer's alphabetically filtered fixtures.

Select a fixture model:

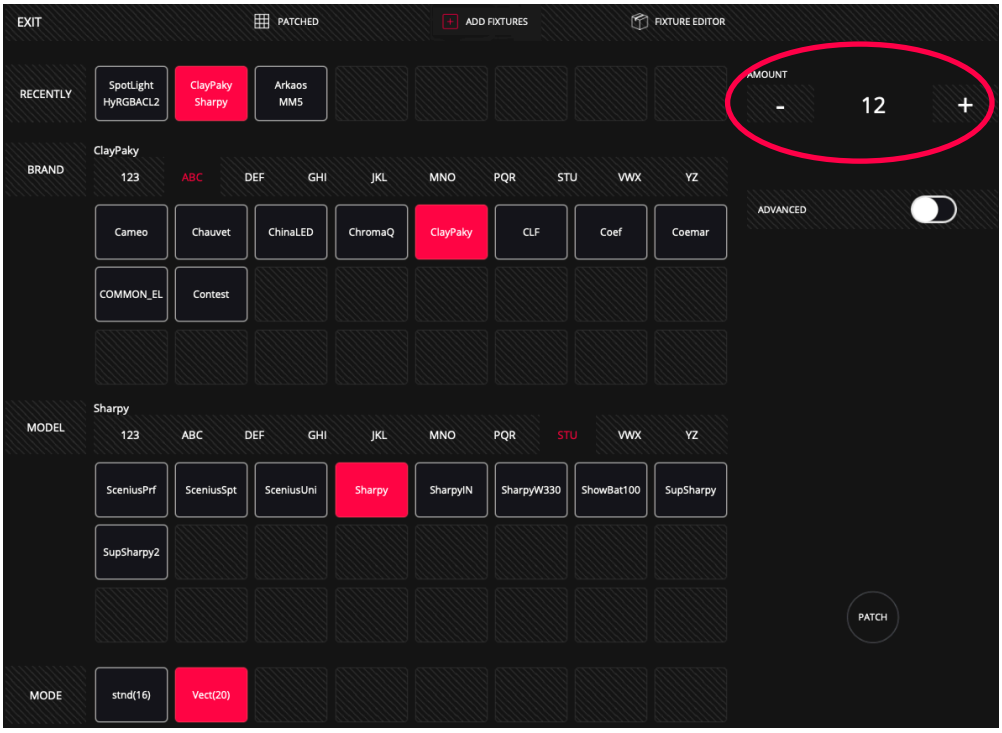


Select the operating mode of the fixture:

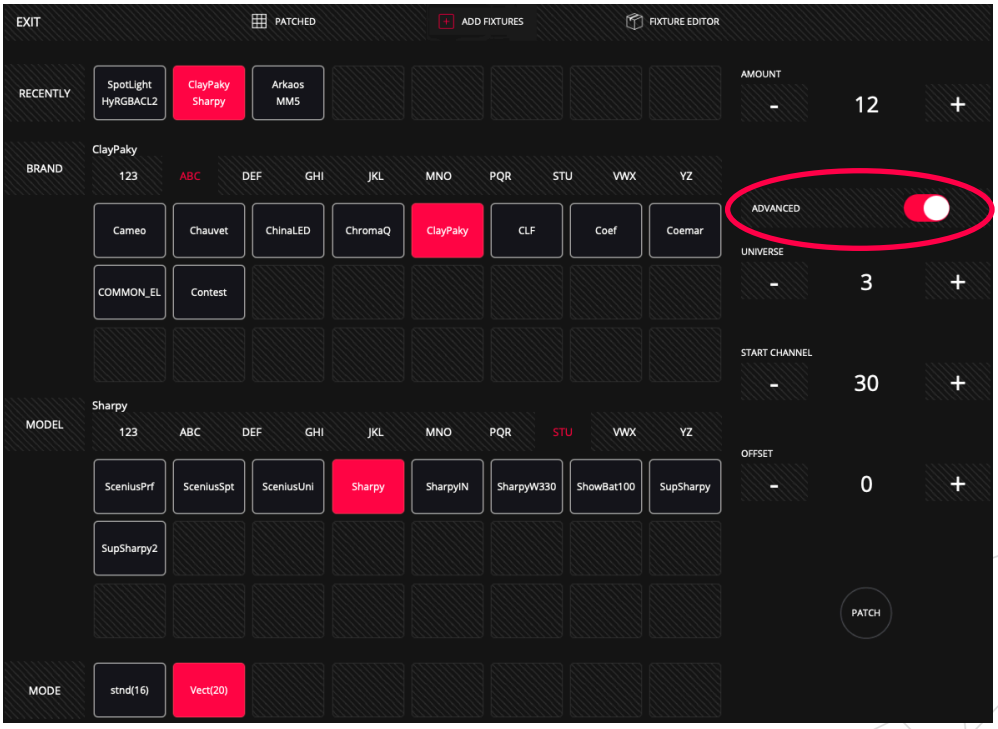


If the fixture has more than 8 operating modes you can scroll to the left to access more modes.

4 Enter the number of fixtures you want to add and press the "Patch" button. The fixture will be added starting with the first available DMX channel.



It is possible to add the fixtures to the show by specifying a DMX address or a specific universe. To do this, enter the number of fixtures you want to add and activate the "Advanced" option.



In the "Universe" field lightShark shows the number of the currently selected universe. If you want to add the fixtures in a different universe, use the + and - buttons to select the appropriate universe. If you hold down the numeric field, the on-screen keyboard will be displayed where you can directly enter the universe number.

Through the "Start Channel" field you can set the number of the starting DMX channel where the fixture (or group of fixtures) will be added. Remember that you can adjust the channel with the + and - buttons or with the keyboard with a long press on the numeric field.

In the "Offset" field the user can define how many channels to leave empty between each of the fixtures. Remember that you can adjust the channel using the + and - buttons, or using the keyboard with a long press on the numeric field.

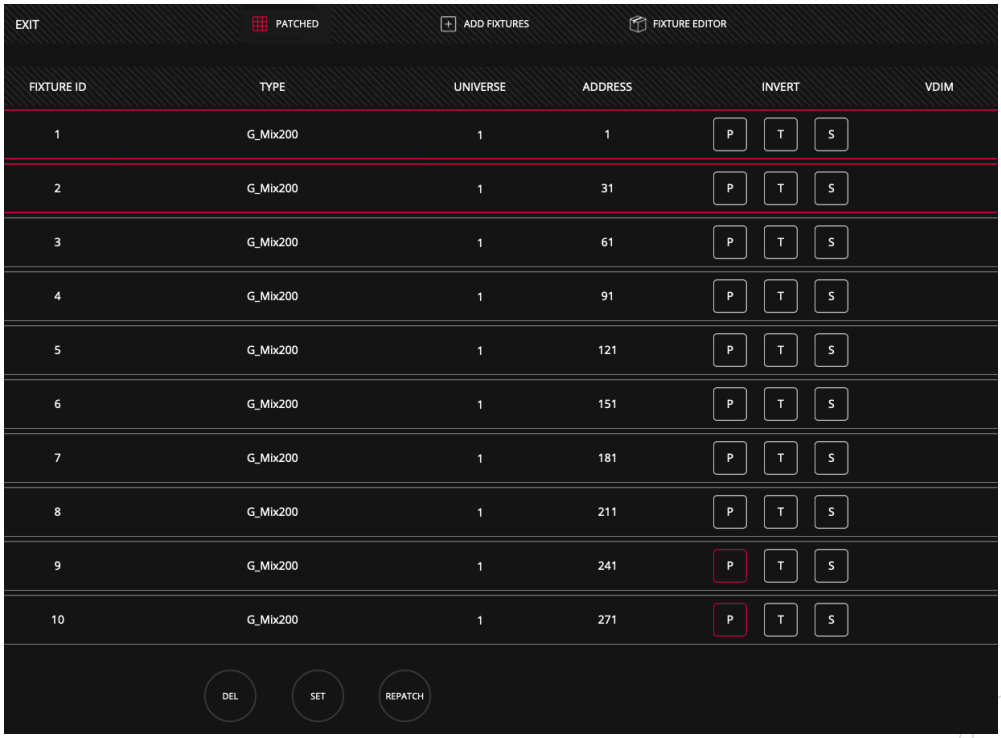
If it is not possible to repatch the fixture on the selected channel Lightshark will show the selected channel in red color.

Repatch

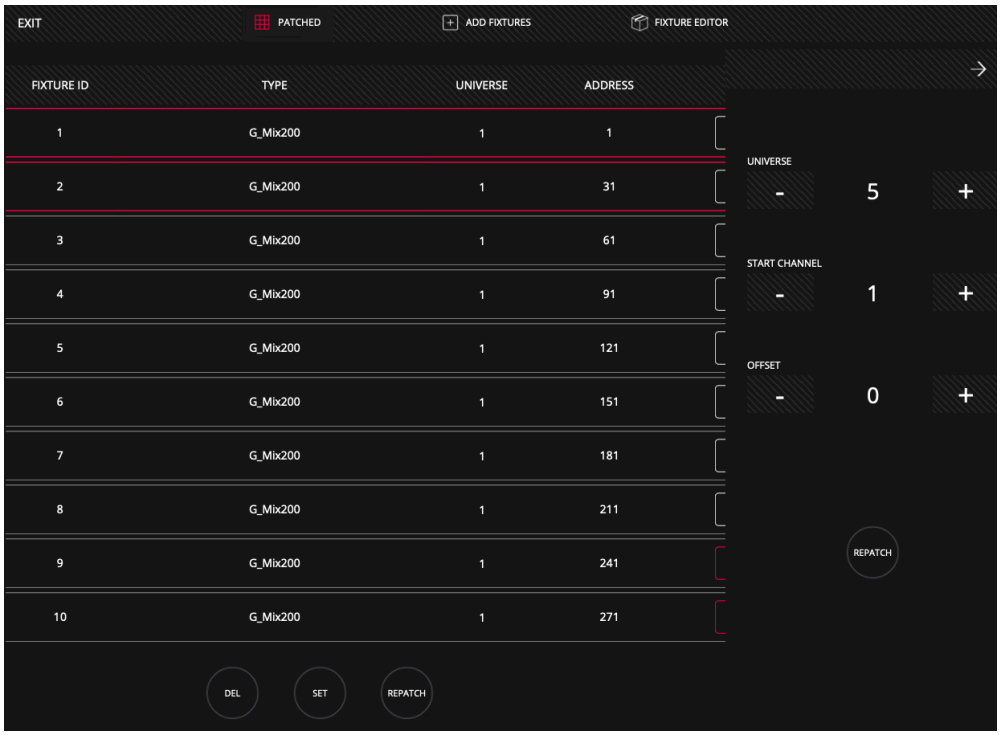
Once the fixtures have been added to the patch, it is possible to change their addresses:

1 Access the lightShark menu through the icon located in the upper left corner, press the patch button and select the upper "Patched" tab.

2 Select the fixture that you want to change the address for.



3 Press the "REPATCH" button, on the right side and a panel will be displayed where you can enter the new DMX address or universe.



4 Set the new fixture address and press the "PATCH" button.

UnPatch

Once the fixtures have been added to the patch, it is possible to remove them:

1 Access the lightShark menu through the icon located in the upper left corner, press the patch button and select the upper tab "Patched".

2 Press the "DELETE" button

3 Select the fixture you want to delete.

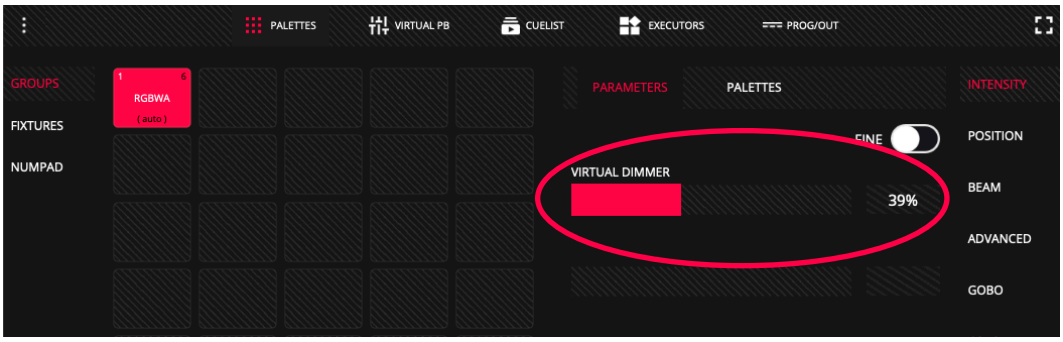
To avoid possible errors, if a fixture is used in a Cue LightShark will ask for confirmation of deleting.

Virtual Dimmers

Virtual Dimmers are mainly used with devices that do not have an Intensity channel. With RGB, RGBW, RGBWA color mixing devices..... we do not have an easy way to control the total intensity and we have to settle for adjusting the individual color channels to alter the brightness, with the risk of changing the desired color.

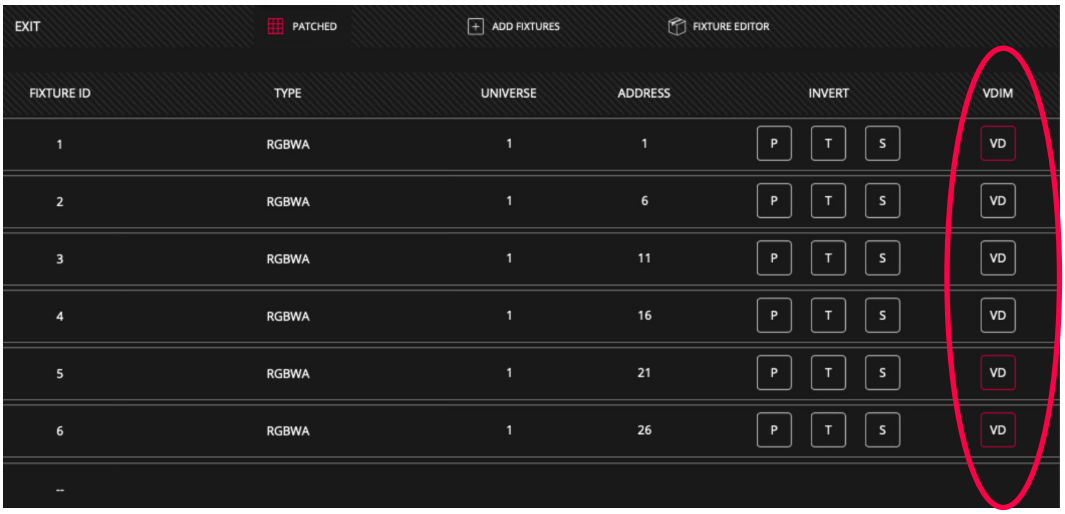
Not only that, but without a dedicated intensity channel, our lighting console has nothing to apply the Dimmer FX to.

When patching any color mixing fixture that does not contain the Intensity parameter, LightShark will automatically add a Virtual Dimmer.



This is where Virtual Dimmer comes in. Having patched our example of a 5-channel RGBWA LED PAR, we can also assign a Virtual Dimmer. This is not another DMX channel, in fact no additional DMX channels are sent from LightShark. Instead, the Virtual Dimmer is a concept that allows fixtures to behave as if they had their own intensity channel that controls the overall brightness and can make use of the Dimmer effect.

It is possible to deactivate the Vdim function of each of the patched devices independently. In the PATCHED window you can activate or deactivate this option.

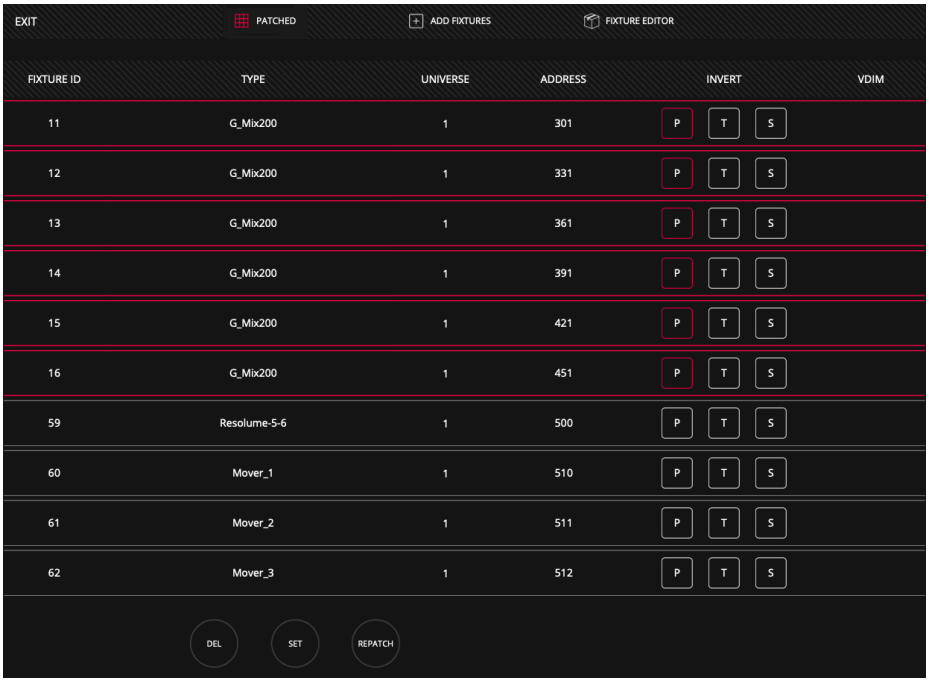


Reverse PAN / TILT

It is possible to reverse the movement of PAN and TILT:

1 Access the lightShark menu through the icon located in the upper left corner, press the patch button and select the upper tab "Patched".

2 Click on the "P" button or the "T" button if you want to invert the Pan or Tilt. The user will use this option depending on the direction in which he has physically mounted the fixture. Press the "S" button to “Swap”, or switch the Pan and Tilt.

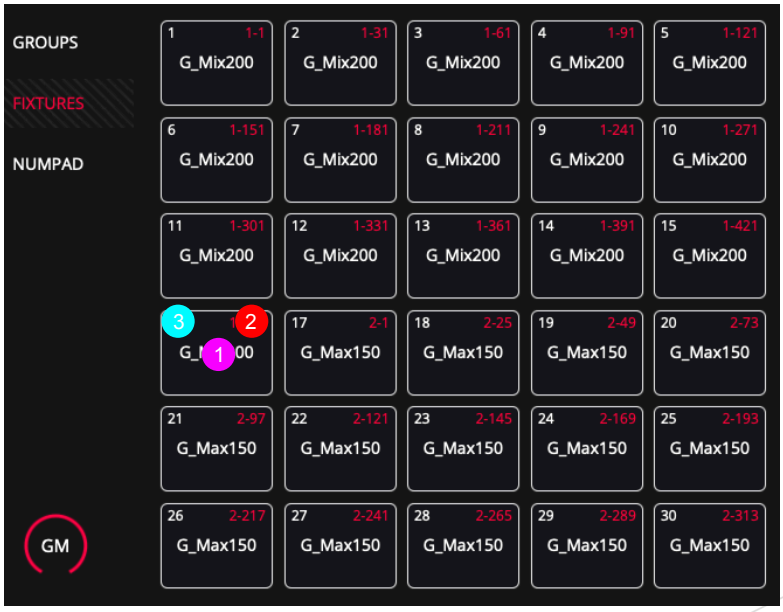


3.4 Fixture Selection

LightShark assigns an ID to each patched fixture, so it can be selected in 3 different ways:

1 **Group View:** By default LightShark creates Auto Groups for each of the fixtures added to the patch. Thanks to this functionality, you will find groups of the different types of fixtures according to the model. Auto-groups can be moved, but not deleted. The user can also create custom groups.

2 **Fixtures View**: All fixtures added to the show are displayed in this window. Each checkbox has 3 fields:



1-Description/label of the fixture

2-DMX Address

3- Fixture ID

3 **Numeric Keypad:** The fixtures can be selected using the numeric keypad. The syntax is as follows:

Select the fixtures from 1 to 8:

1THRU8OK

Select fixtures 1 and 8:

1+8OK

Select fixtures 1 to 5 and 8:

1THRU5+8OK

Select the fixtures from 1 to 5, but not 3:

1THRU5-3OK

Select the fixtures from 1 to 3, and from 6 to 8:

1THRU3+6THRU8OK

Creating Fixture Groups

LightShark allows the creation of groups of fixtures:

1 In the Fixtures window, select the fixtures you want to group.

2 Once selected, click on the "REC" button and select an empty box above the Groups window.

Renaming a fixture group

LightShark allows you to name the groups of fixtures, so you can identify the groups more easily. You can rename the groups in 2 different ways:

A Press the "SET" button and then select the fixture group you want to rename, LightShark will display the on-screen keyboard.

B Select the fixture group you want to rename and hold down the box for 2 seconds. LightShark will display the on-screen keyboard.

Moving a group of Fixtures

LightShark allows you to move the position of the fixtrure groups within the window:

1 In the Groups window, select the fixture group you want to move.

2 Once selected, click on the "MOVE" button and select an empty box above the Groups window.

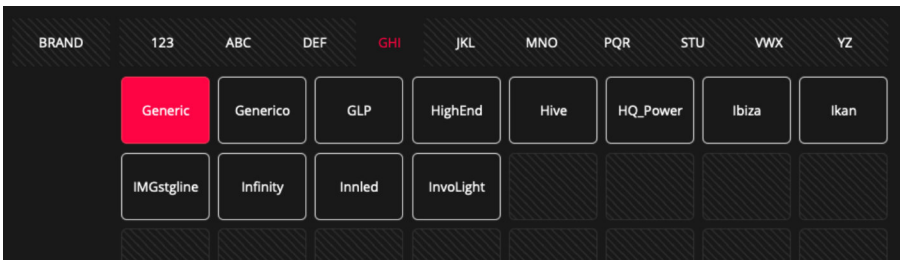
3.5 Dimmer channel control

As explained above each lighting fixture is listed under its respective manufacturer, while "conventional" fixture such as dimmer channels, fog machines and scrollers are listed under the manufacturer "GENERIC".

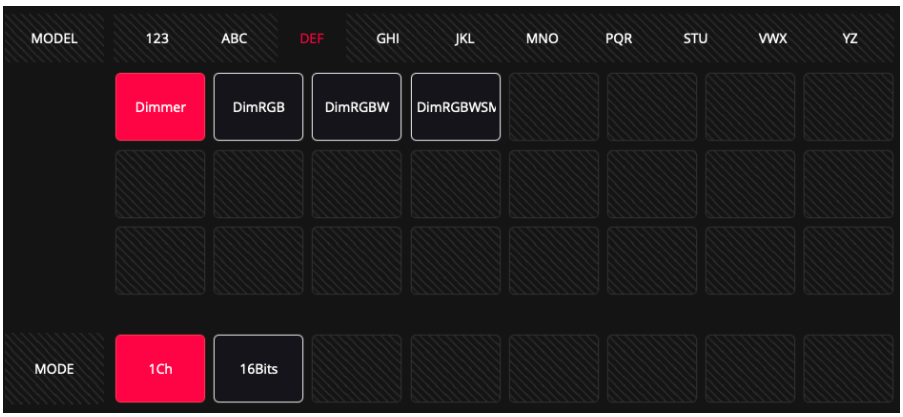
Example: Control of 24 dimmer channels:

1 Access the lightShark menu through the icon located in the upper left corner, press the “PATCH” button and select the upper tab "ADD FIXTURES".

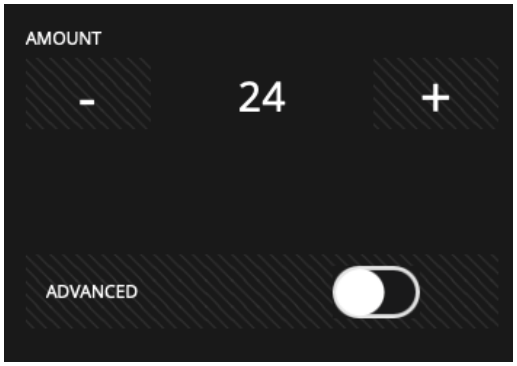
2 Select the "GHI" tab and then select "Generic".



3 In the section "MODEL" select the tab "DEF" and then select "Dimmer". In the lower part select "1Ch" mode.



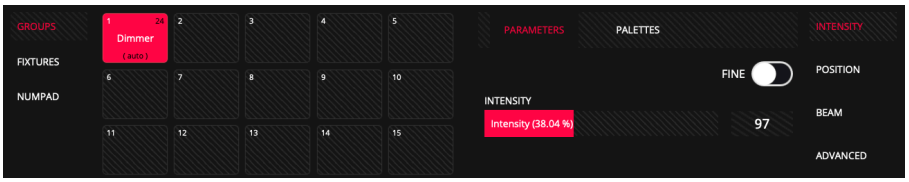
4 In the “AMOUNT” field enter "24" and press "PATCH".



5 Once the fixtures have been added to the Patch, return to the palletes window by pressing the "EXIT" button in the upper left corner

6 In the group view you will find an Auto-Group containing the 24 added dimmer channels.

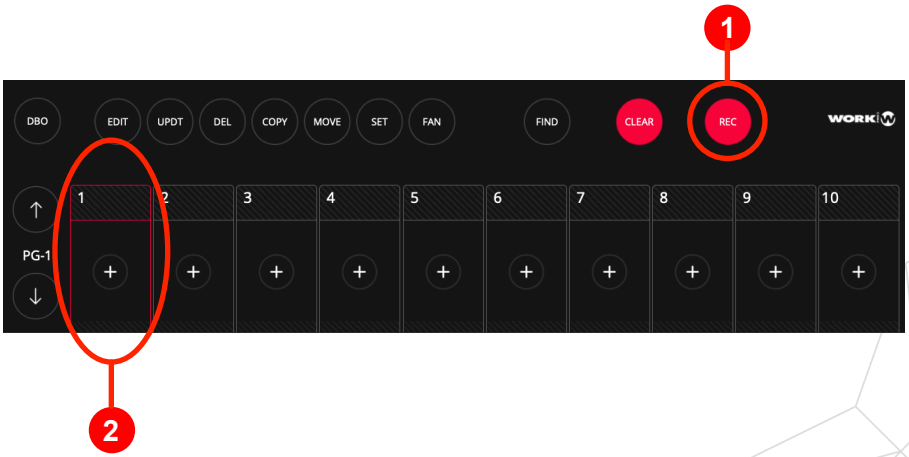
7 Select the fixture group (or individually in the "FIXTURES" view) and select "INTENSITY" in the parameter area:



8 You can adjust the level via the graphical interface or with encoder A if you are using an LS-1.

You can adjust the level to the maximum by pressing the "FIND" button.

9 Once the desired level has been set, press the "REC" button and then select a Playback.



10 Press the "CLEAR" button to clear the programmer information. You can now adjust the level through the PB-1 Fader.

3.6 Fixture Control

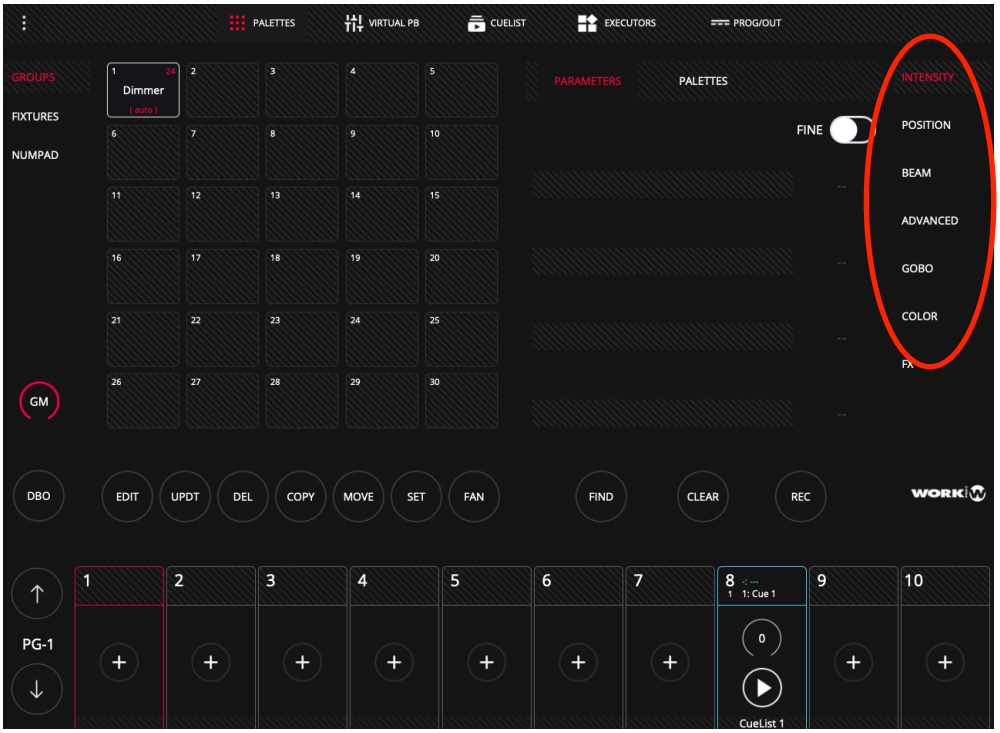
Intelligent lighting fixtures have different types of attributes, among which are Pan, Tilt, Spot, Color, etc. LightShark groups all these parameter types into 6 groups:

Parameter Type	Parameter
	Intensity
	BackGround Intensity
	Pattern Intensity
INTENSITY	Shutter
	Strobe
	BackGround Strobe
	Pattern Strobe
	Bright
	Pan
	Pan Conitinuous
	Tilt
POSITION	Tilt Continuous
	Pan/Tilt Speed
	Position
	Aspect Ratio
	Image Size
	XYZ Rotation
	Keystone
	Red
	Green
	Blue
	Amber
COLOR	White
	Cyan
	Magenta
	Yellow
	CTO

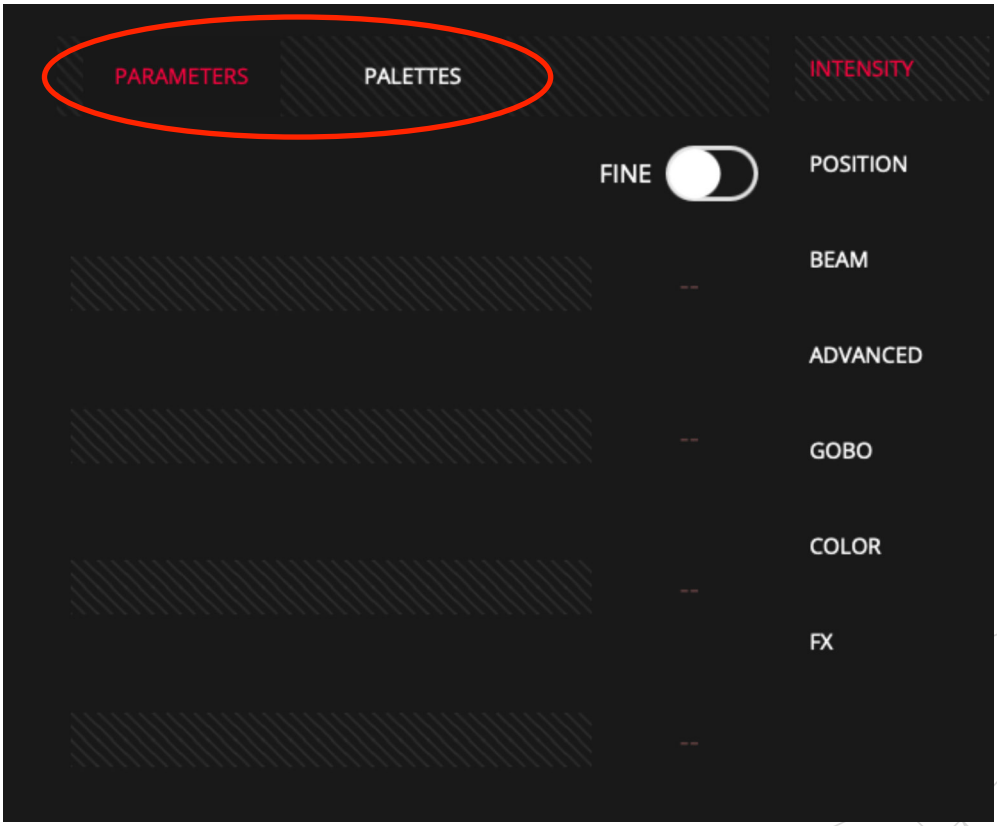
	CTB
	CTC
	Color
	Hue
	Saturation
	Color Mix
COLOR	UV
	Mint
	Lime
	Add
	Multiply
	Contrast
	Sharp
	Tint
	Focus
	Zoom
	Iris
	Frost
BEAM	Prism
	Prism Rotation
	Framing
	Framing Rotation
	Beam Effect
	Beam Shapper
	Gobo
	Gobo Rotate
	Media Folder
GOBO	Media File
	Media Transition
	Media Speed
	Media IN
	Media OUT

	Pattern
	Pattern Rotate
GOBO	Media Folder
	Media File
	PlayMode
	Media Transition
	FX
	Function
	Macro
ADVANCED	Custom
	Unknown
	Reserved
	Generic
	Empty

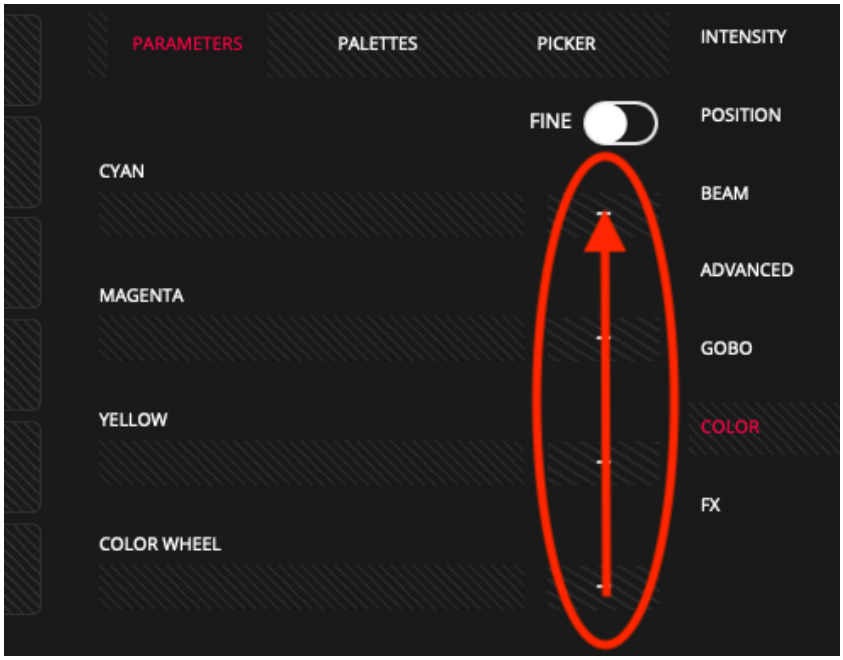
You can find the access to these parameter types on the right side of the palletes window



By default each section has a parameter view and a palletes view:

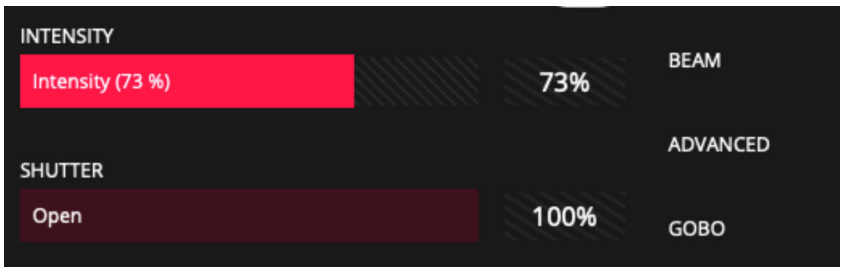


In the parameter view the user will find all parameters of the selected type. By default the parameters are always shown in blocks of 4, if the selected device has for example 7 channels of type "BEAM" it is possible to access the next 3 by scrolling vertically with your finger. Or by clicking again on the parameter button on the LS-1.



Users with an LS-1 can interact with the interface using the encoders and buttons, so that each LS-1 encoder controls each of the currently visible interface parameters (the upper parameter is controlled by the first encoder starting from the left, and so on).

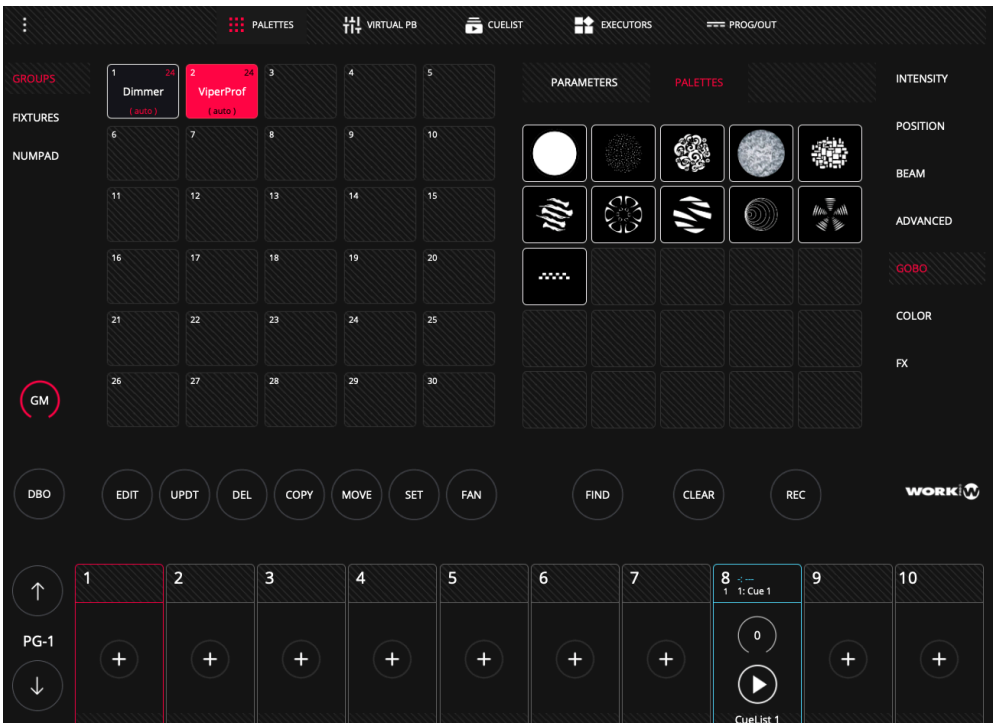
Depending on the value type it is represented in a different color:



The values included in the programmer are represented in light red, the rest of the values that are not added in the programmer are represented in dark red.

The information shown in this area is also shown on the LCD screen that integrates the LS-1. It is possible to switch between parameters using the console's physical parameter buttons, as well as scrolling over the interface.

Each type of parameter has its corresponding palettes, in some of the boxes the palettes defined by the fixture profile will be shown, in the rest of the boxes the user can record his own palettes.



LightShark displays up to 25 pallets simultaneously, it is possible to perform vertical scrolling as in the parameter window to access more pallets.

In the case of the Position and Color parameters it is possible to see a third view in addition to "PARAMETERS" and "PALETTES".

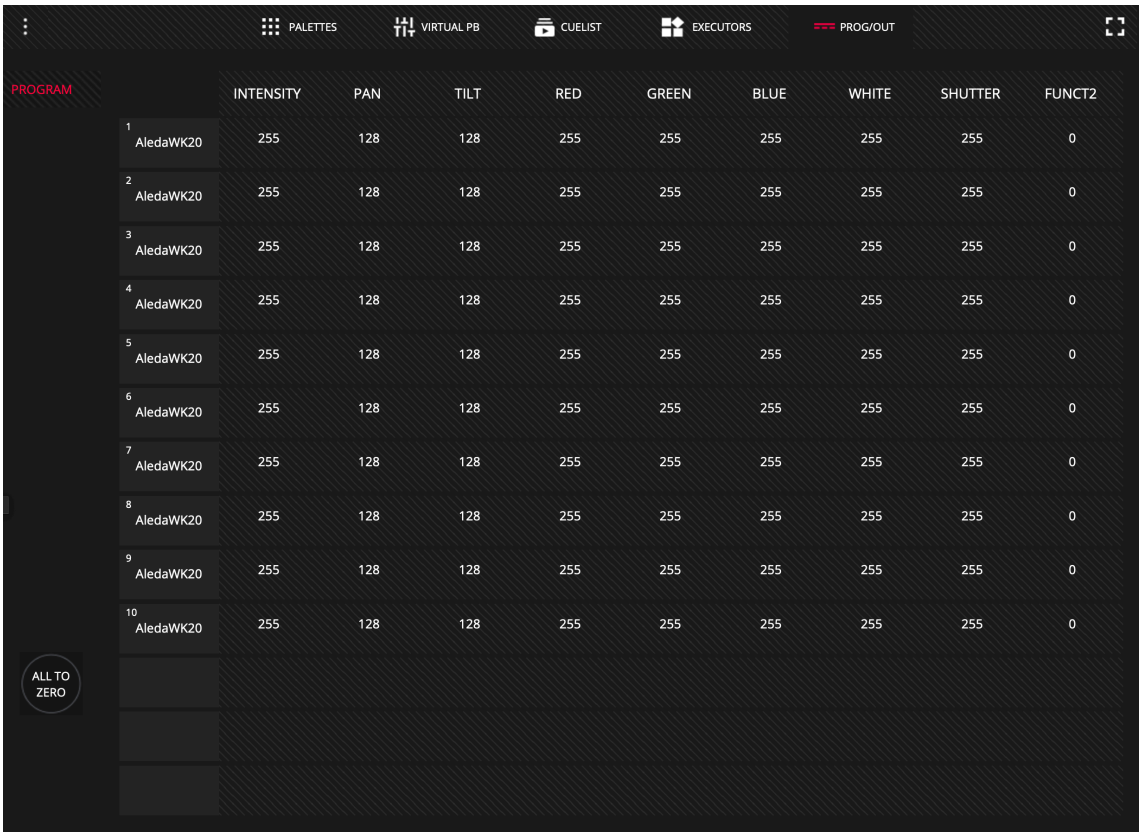
3.7 Recording Scenes

All show information storage is carried out by the programmer and lightShark uses this information when recording Playbacks, palettes, groups... The programmer has priority over all PlayBacks, Cues, Cuelist and channels. A fixture is included in the programmer when any attribute is modified.

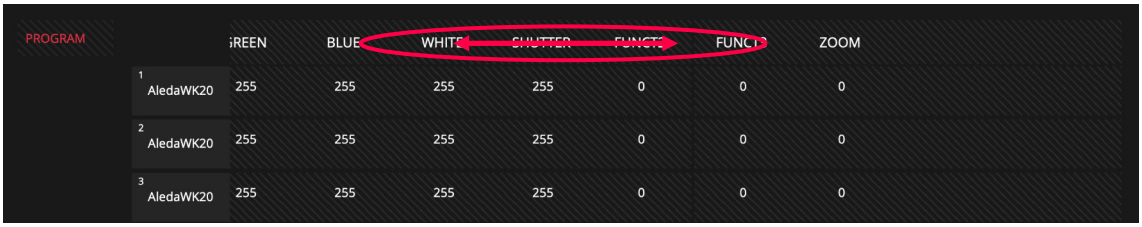
The CLEAR button illuminates when there is information inside the programmer. Press the "CLEAR" button to erase the information inside the programmer and all channels will be removed from the programmer and the HTP channels will be reset. It is possible to change the behavior of the "CLEAR" from the main menu by choosing to return all channels to the default value defined in the library.

When the "FIND" button is pressed and there is a selected fixture then we are activating the parameters that have been defined in the library for “FIND”.

The programmer window allows the user to see what is in the programmer and how it is configured. It is possible to access the programmer window from the top navigation bar by clicking on the PROG/OUT tab.



On the left the fixtures are shown and on the right the values of the active parameters in the programmer. It is possible to display the rest of the parameters by scrolling over the parameter columns.

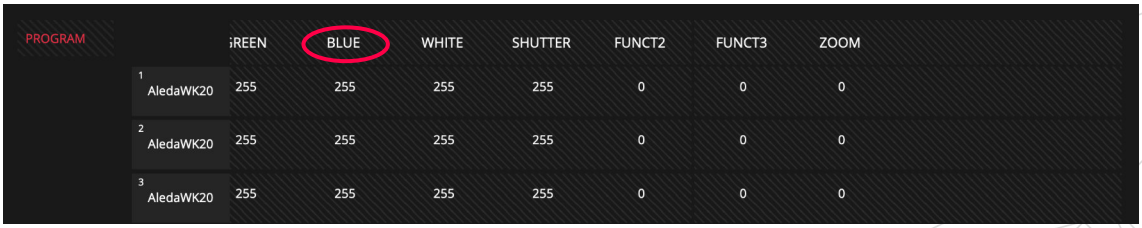


Removing a Parameter from the Programmer

Below you will find the procedure to remove a parameter from all the fixtures in the programmer:

1 Press DEL

2 In the PROG/OUT window click on the type of parameter.

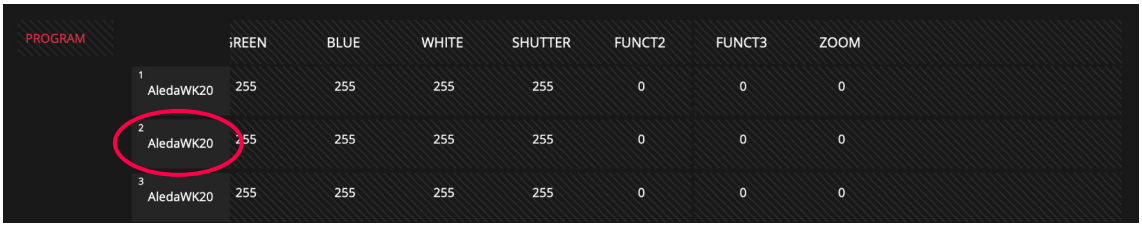


Removing a Fixture from the Programmer

Below you will find the procedure to remove a Fixture from the programmer:

1 Press DEL

2 In the PROG/OUT window, click on the fixture you want to remove from the programmer.

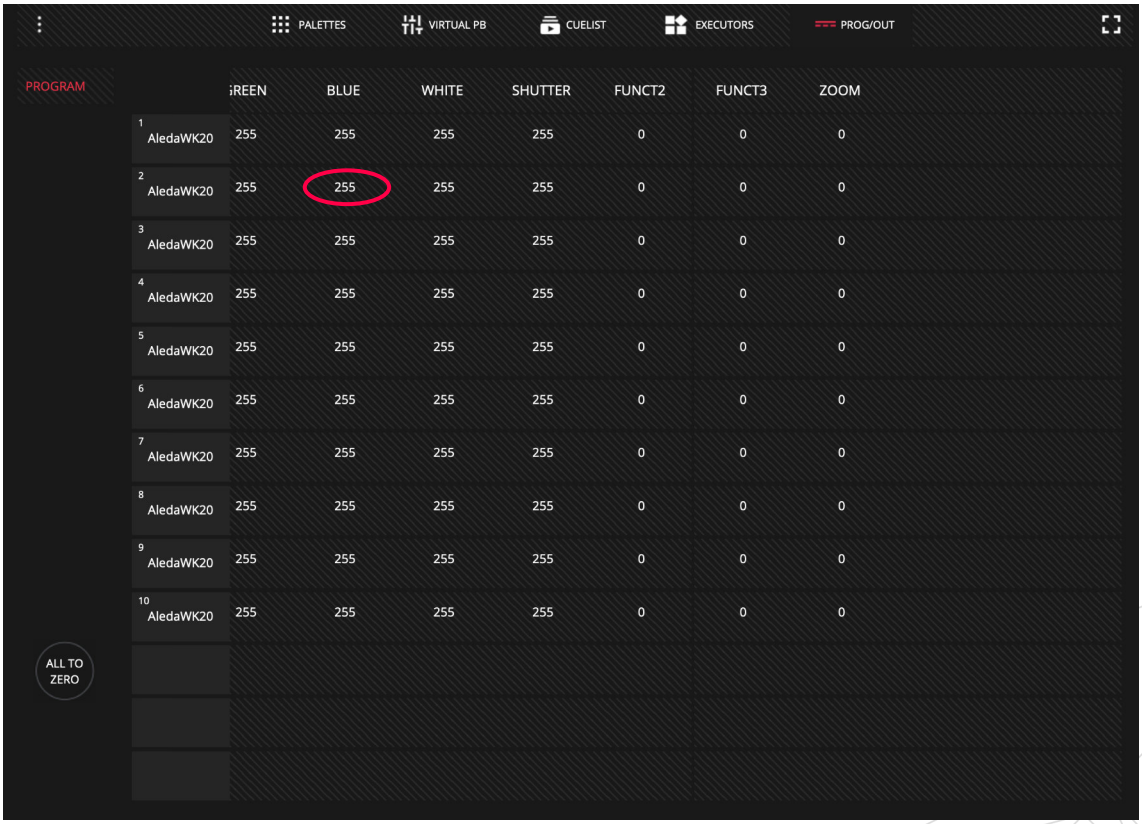


Removing a Parameter from a Specific Fixture in the Programmer

Below is the process for removing only one parameter from a single Fixture that is included in the programmer:

1 Press DEL

2 In the PROG/OUT window click on the value of the specific parameter you want to delete.



The Cuelist

CueLists are used to manage sequences of Cues. They keep track of the order of Cues and the options of how they are reproduced. A CueList can have a single Cue associated with it or the entire list of Cues.

When a Cue is recorded in a Playback a Cuelist is automatically generated. LightShark adds that created Cuelist to the list of Cuelists that are stored in the Cues window.

If the playback already has a Cuelist stored in it, then the new Cue will be added to the end of that Cuelist.

The CueList stores a Cue ID and a text field for each of the Cues so that all steps can be tagged. The Cue ID and text field are displayed on the Playback screen when the list is played, this allows the user to keep track of the current Cue during the show.

Recording a Cuelist

Below is the process for recording a Cuelist over an empty Playback:

1 Select a fixture (or fixture group)

2 Modify at least one of the parameters (or press FIND to activate all parameters)

3 Press the RECORD key (illuminated)

4 Select the Playback where you want to store the Cue. Doing this will create a new Cuelist and assign you a Cuelist ID with the next available Cuelist ID to the general list of Cuelists.

In addition a new Cue is created that is added to the beginning of the Cuelist and it is assigned a Cue ID with the following available Cue ID with respect to the general listing of Cues.

5 Press CLEAR to empty the programmer.

6 Activate the Playback to check that everything has been recorded correctly.

Recording on a Playback that already contains information

Here is the process for recording a Cue on a Playback that already contains information:

1 Select a fixture (or fixture group)

2 Modify at least one of the parameters (or press FIND to activate all parameters)

3 Press the RECORD key (illuminated)

4 Select the Playback where you want to store it. Doing so will add the Cue to the end of the Cuelist and assign it a Cue ID with the next available Cue ID from the general Cues list.

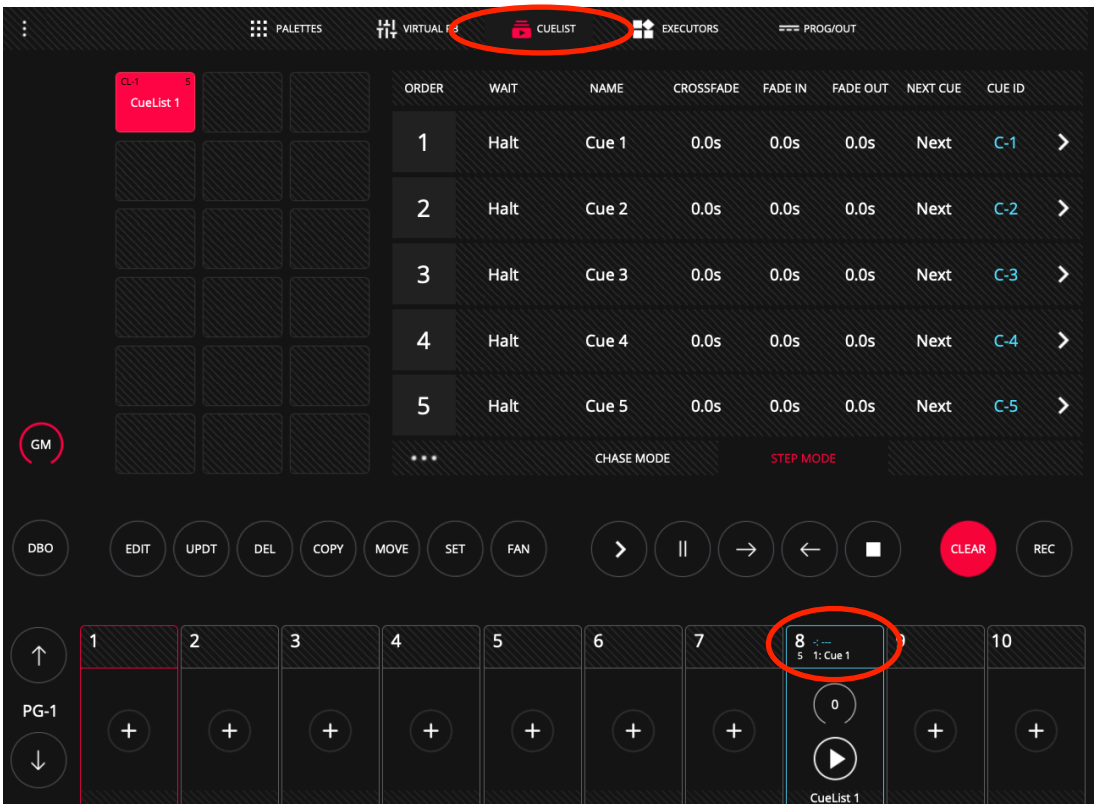
5 Repeat steps 1-4 as necessary.

6 Press CLEAR to empty the programmer.

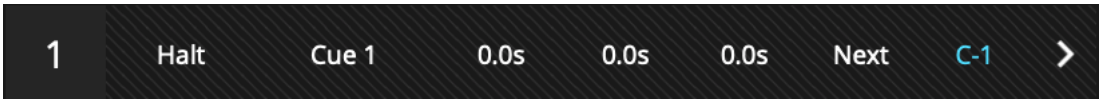
7 Activate the Playback to check that everything has been recorded correctly.

Assigning Times to a CueList

It is possible to assign different waiting and fade times to each of the Cues. You can access a CueList's information from the CueList view or by quickly pressing twice on the Playback number.



Each Cue has a Crossfade time where you can define a Fade In time and a Fade Out time.



1 Access a CueList

2 Hold down the "HALT" field to assign the Cue a wait time.

3 Hold down the "CROSSFADE" field to assign a transition time between one Cue and the next.

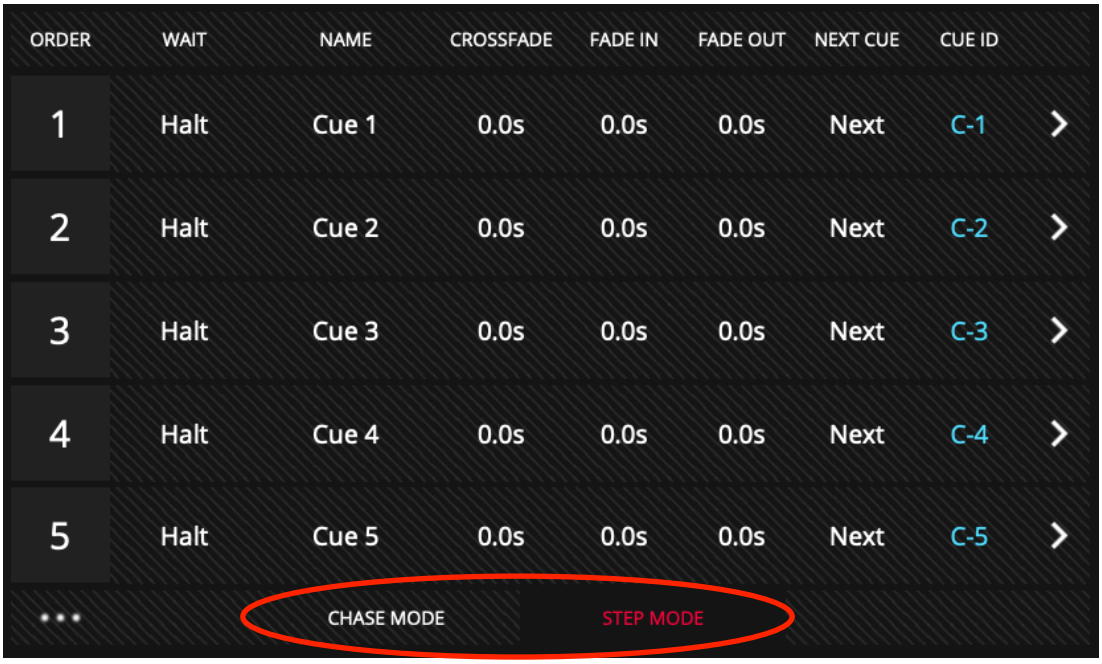
4 Hold down the "FADE IN" field to assign an input fade time.

5 Hold down the “FADE OUT” field to assing a Fade Out (if necessary)

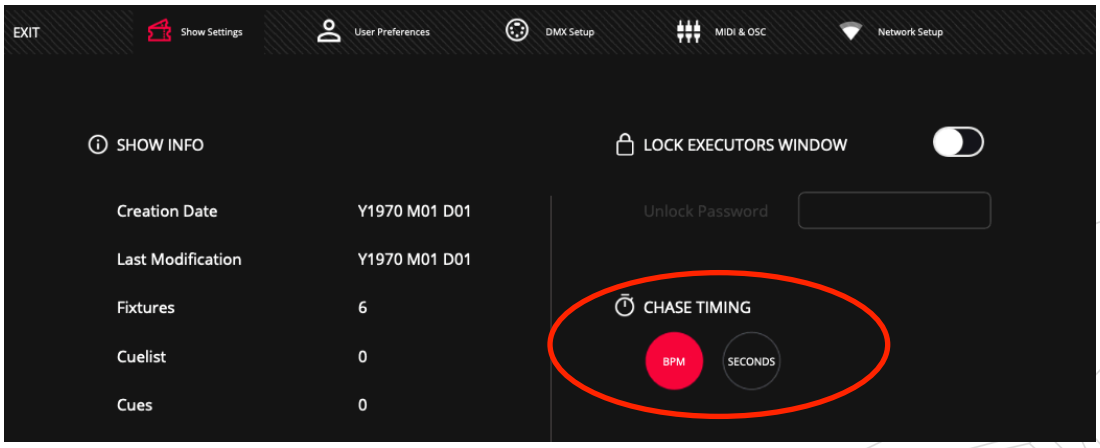
Set a CueList as Chase

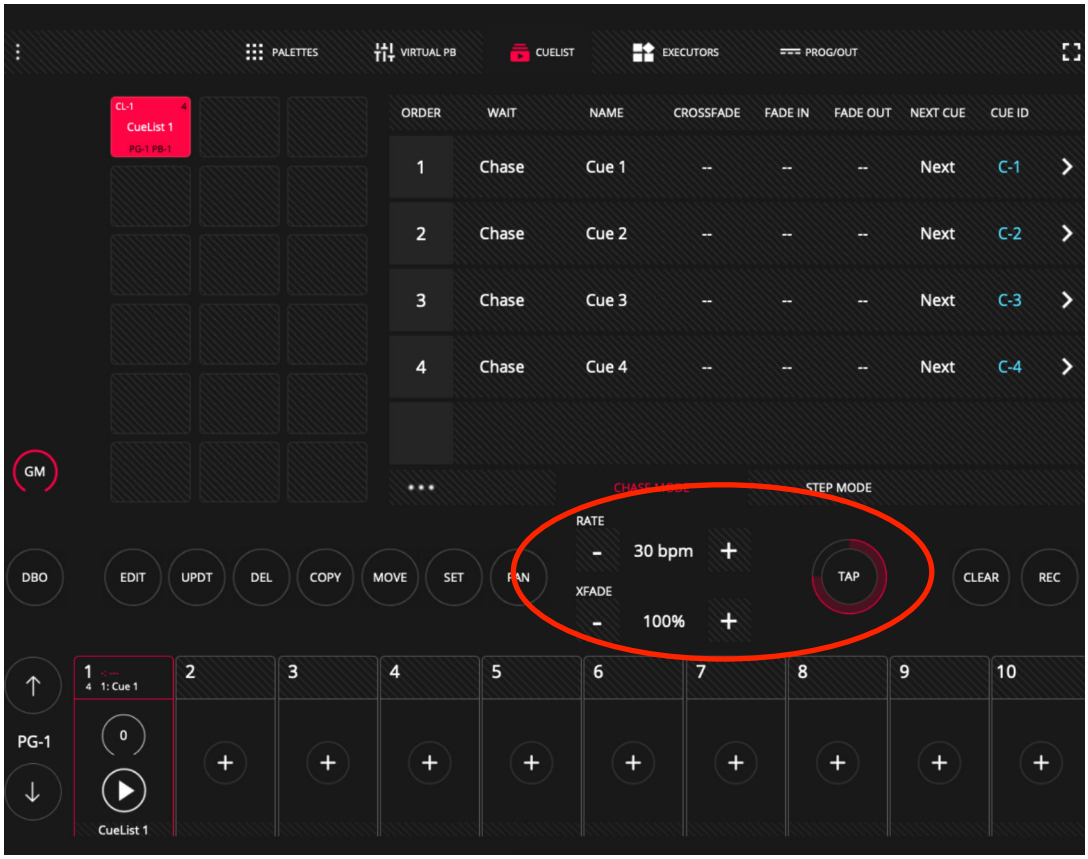
It is possible to use a CueList to make a Chase. Thus any wait time is ignored and each cue becomes a Chase step, where there is a global "Xfade" and "Rate" time for all Cues that make up the CueList.

You can switch from one mode to another using the "Chase Mode" or "Step Mode" buttons.



In the SHOW SETTINGS main menu it is possible to select the Chase workind mode, being able to choose between BPM and Seconds.



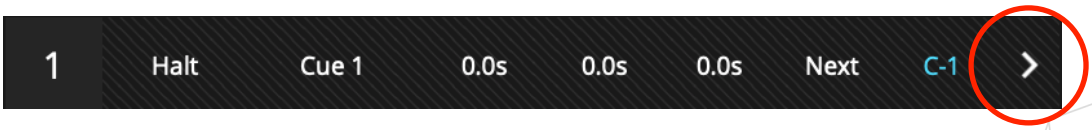


To adjust the BPM, press the TAP button repeatedly until the ring is complete,.

If you are using an LS-1 you can adjust the BPMs by holding down the Playback selection button and entering the pulses with the Flash button.

View information contained in a Cue

It is possible to see the information contained in a Cue:



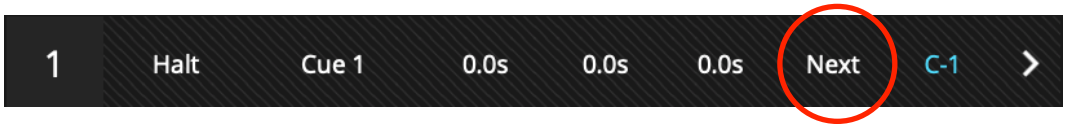
Clicking on the arrow icon will show all the information stored inside:

C-3	INTENSITY	INTENSITYF	PAN	PANF	TILT	TILTF	SHUTTER	CYAN	MAGENTA
25 ViperProf	255	0	128	0	128	0	25	0	0
26 ViperProf	255	0	128	0	128	0	25	0	0
27 ViperProf	255	0	128	0	128	0	25	0	0
28 ViperProf	255	0	128	0	128	0	25	0	0
29 ViperProf	255	0	128	0	128	0	25	0	0
30 ViperProf	255	0	128	0	128	0	25	0	0
31 ViperProf	255	0	128	0	128	0	25	0	0

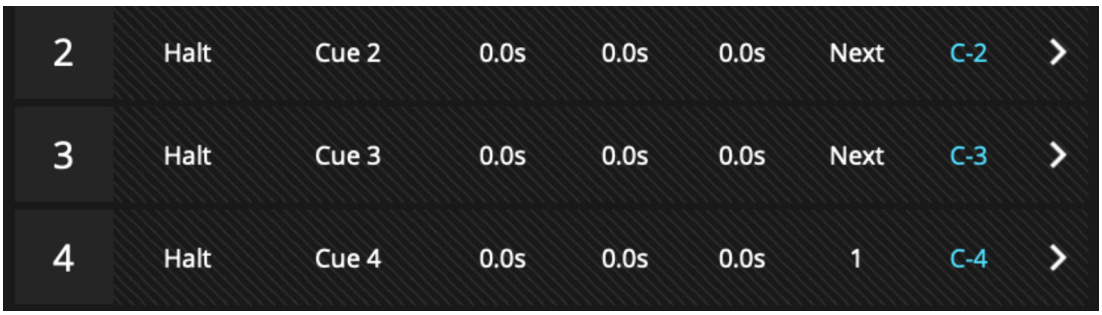
You can modify the Cue information by changing values, deleting parameters, deleting devices...

Change the playback order of the CueList

By default the Cues are reproduced consecutively. It is possible to alter the order of reproduction by modifying the "NEXT CUE" field. The default value is "NEXT".



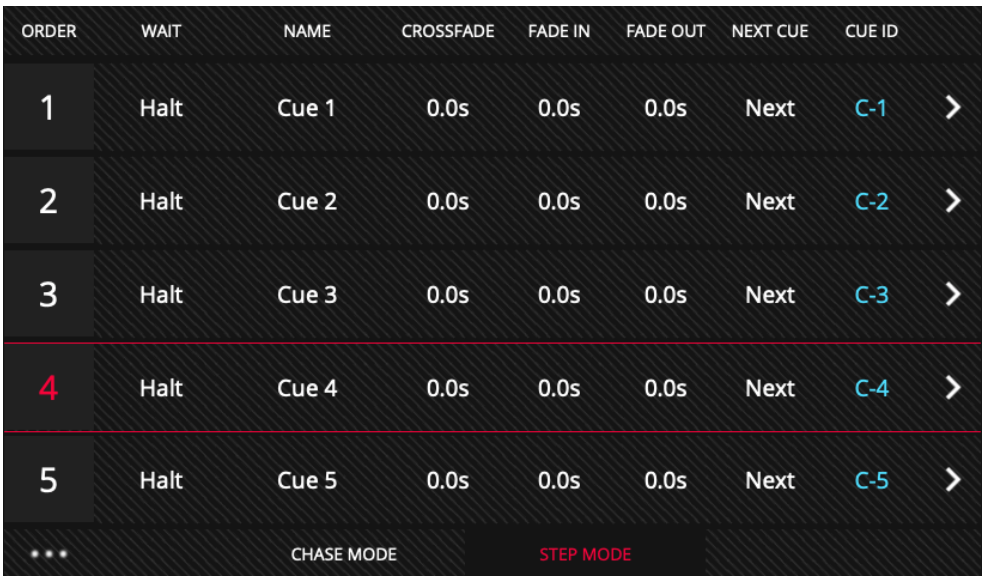
Hold down the "Next" field for two seconds and enter the ID of the Cue you want to go next.



Move an order Cue within a CueList

It is possible to change the order of a Cue within a CueList:

1 Select the Cue you want to move.



2 Press "MOVE".

3 Select the Cue on which you want to move the selected Cue.

Removing a Cue from a CueList

It is possible to remove a Cue from a CueList:

1 Press "DEL".

2 Select the Cue you want to delete.

Copying a Cue

It is possible to copy a Cue from one CueList to another:

1 Open the Cuelist window and select the Cuelist containing the Cue you want to copy. Then select the Cue.

2 Press "COPY" and select the destination CueList.

Deleting a CueList

By default lightShark does not allow you to delete a CueList that contains information inside. It is necessary to remove all the Cues it contains in order to remove it.

You can change this behavior from the preferences:

1 Access the LightShark menu through the icon located in the upper left corner, press the "Settings" button and select the upper "User Preferences" tab.
2 Activate the "CUELIST REMOVE" option.

Editing a Cue

It is possible to edit a Cue from a CueList .

1 Open the Cuelist window and select the Cuelist containing the Cue you want to edit. Then click "EDIT".

2 Select the Cue you want to edit.

3 The Cue will be loaded into the programmer, so from the Palette window you can make the necessary changes.

4 Once the changes have been made, press "UPDATE". The Cue information will be updated with the changes made.

5 Click "CLEAR" to clean the programmer.

Note that once a Cue's information has been uploaded to the programmer it is also possible to use that information to record a new Cue.

3.8 Adding FX

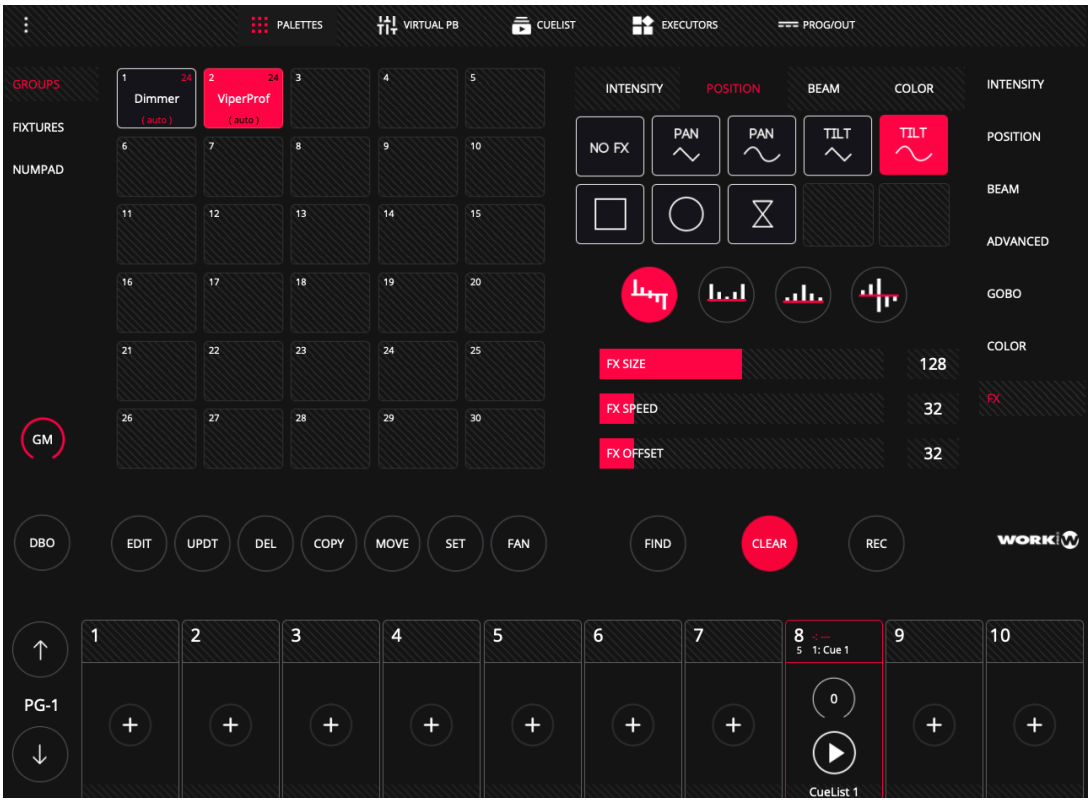
LightShark includes an internal effects generator. FX's can be applied to a fixture or group of fixtures directly without having to create multiple Cues to create an effect. FXs can be modified live, allowing you to adjust the speed and the FX amplitude according to the rhythm of the show.

LightShark has an extensive internal FX library (e.g. circles, squares, pan, tilt, zigzag...), in addition to Position effects, there are also Beam, Color and Intensity effects.

The use of FX allows the complete recording of shows in just a few minutes.

It is possible to add an effect to one or several fixtures, or to a group or several groups of fixtures. To add an FX the user must first select one or more fixtures and then from the "FX" window select one of the effects that incorporates lightShark.

Once you've selected an FX it is possible to modify its parameters (speed, size, offset...) through the virtual sliders that appear on the screen (or from the encoders in the LS-1).



It is possible to add several effects to a fixture (or groups of fixtures) that make use of different attributes, for example, the user can add a Pan effect and also add an effect of Intensity and an effect of change-color.

LightShark groups effects into 4 categories: Intensity, Position, Beam, and Color. Each category can have up to 9 effects.

FX SIZE: Defined as the range in which the parameter value varies. This is described in terms appropriate for that particular parameter.

It can be modified through on-screen sliders. By default, when adding an effect the Size value is set to 50%.

FX SPEED: Can be modified through on-screen sliders. To maintain synchronization between the characteristics of an effect, the speed of the effect is controllable.

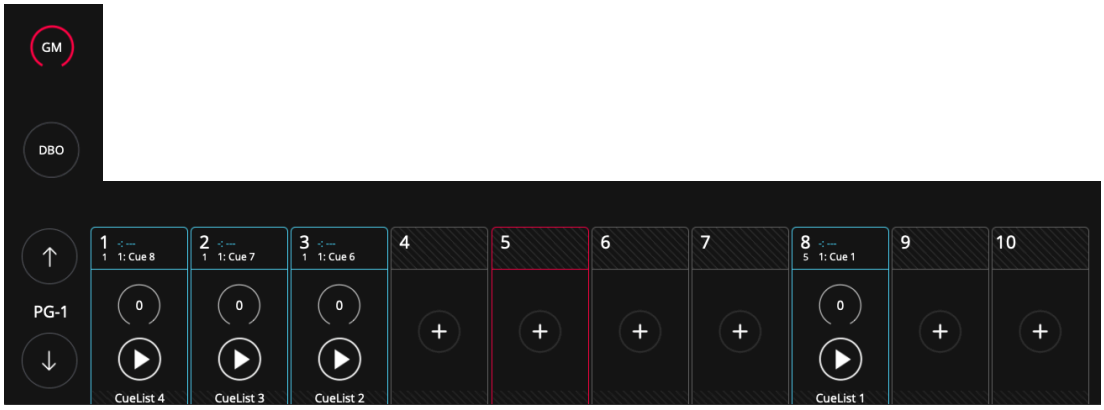
Adjusting the speed of an effect increases or decreases the number of cycles completed per minute.

OFFSET: The Offset defines the start and end point for each effect, so that individual fixtures can run the effect at the same time, or with a “fanned” look.

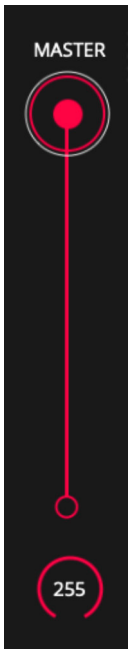
With the shortcut buttons it is possible to have 4 different "types" of offset shapes (or sets of shapes).

3.9 Scene Playback

It is possible to control the playback of the show, to trigger the Cuelist and to control the release of the Playbacks from the Playback Zone.



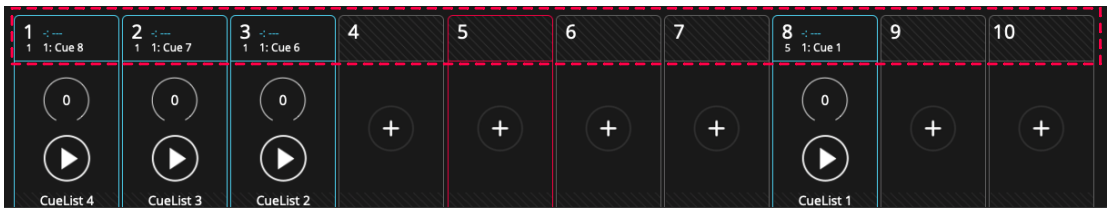
By default the GrandMaster is minimized. Click on the button to enlarge it and show the fader. Pressing it again will minimize it.



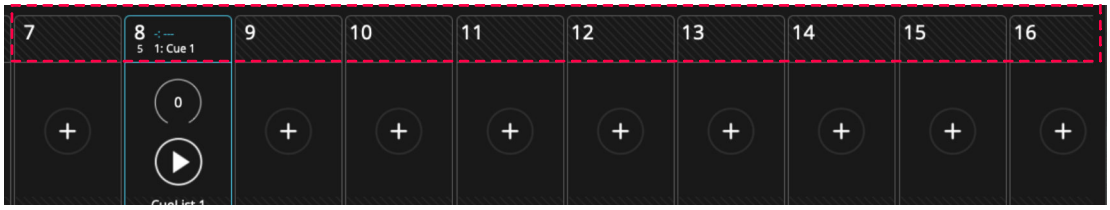
It is possible to enter a specific level into the GrandMaster by holding down the value field for 2 seconds.

LightShark allows the reproduction of all the information stored in the show through the Playbacks. LightShark supports up to 30 Playbacks per page, distributed in 10 main Playbacks located next to the UI of the software and in other 20 accessible making horizontal scrolling with your finger on the Playbacks area.

These 20 playbacks, accessible by sliding (or from the "Virtual Playbacks" View) behave like Wings.



As you slide your finger toward
on the left you can access the rest of Playbacks.



Slide finger horizontally
to navigate between the 30 Playbacks.

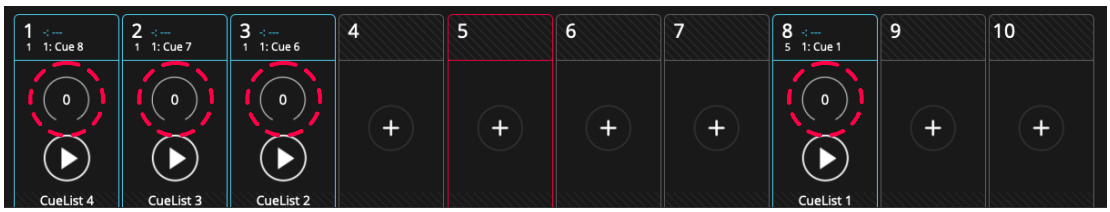
LightShark allows you to control the Playbacks using:

Keyboard: A Playback can be mapped to a key on the computer keyboard.

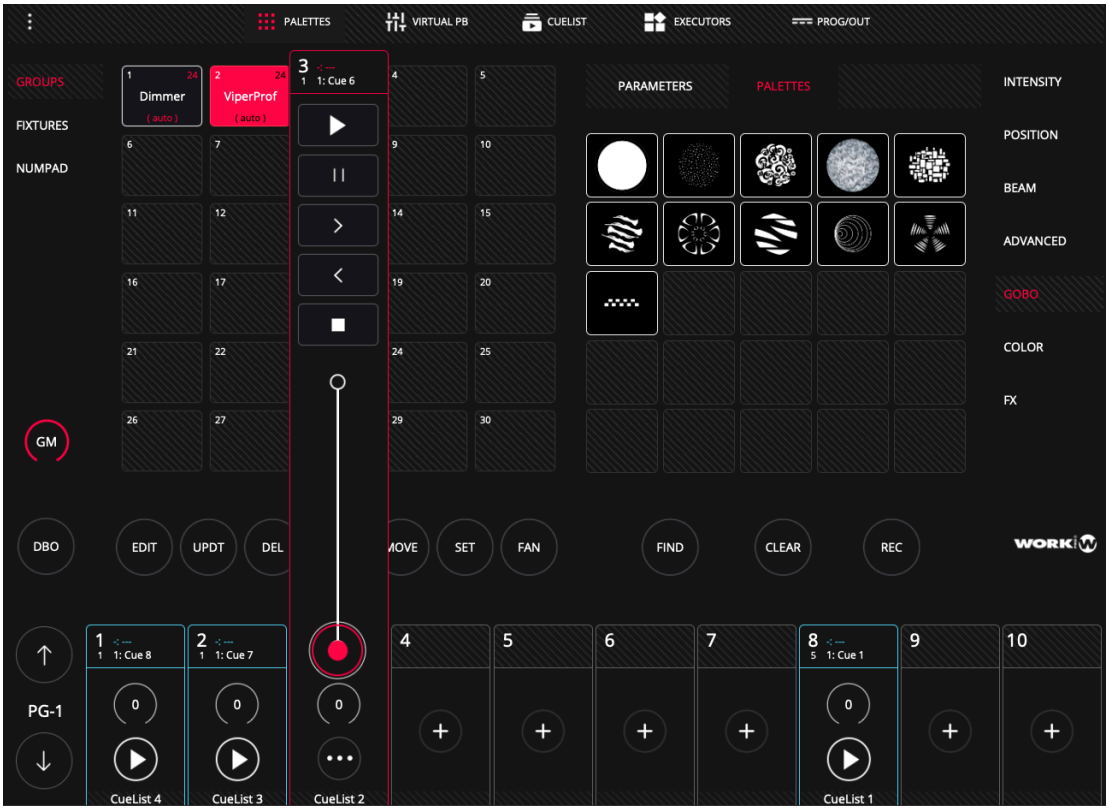
MIDI: Any component (Fader, Encoder, Button) from a MIDI controller can be mapped to a Playback so that it can be triggered or the level adjusted.

The control surface is set to always control the first 10 Playbacks regardless of the 3 selected Playbacks blocks. This means that when you slide your finger to access Playbacks 11-20 the control surface will continue to operate over the first 10 Playbacks.

The Playbacks are always minimized, in case you want to have access to all the control functions of the Playback, you must click on the intensity level indicator of the fader to maximize it.



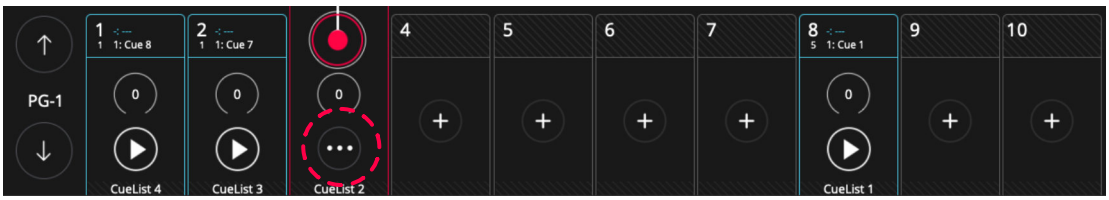
When Playback is maximized, only the buttons on that playback will work. To access the rest of the user interface again, you must minimize the Playback.



It is possible to enter a specific level into a PlayBack by holding down the value field for 2 seconds.

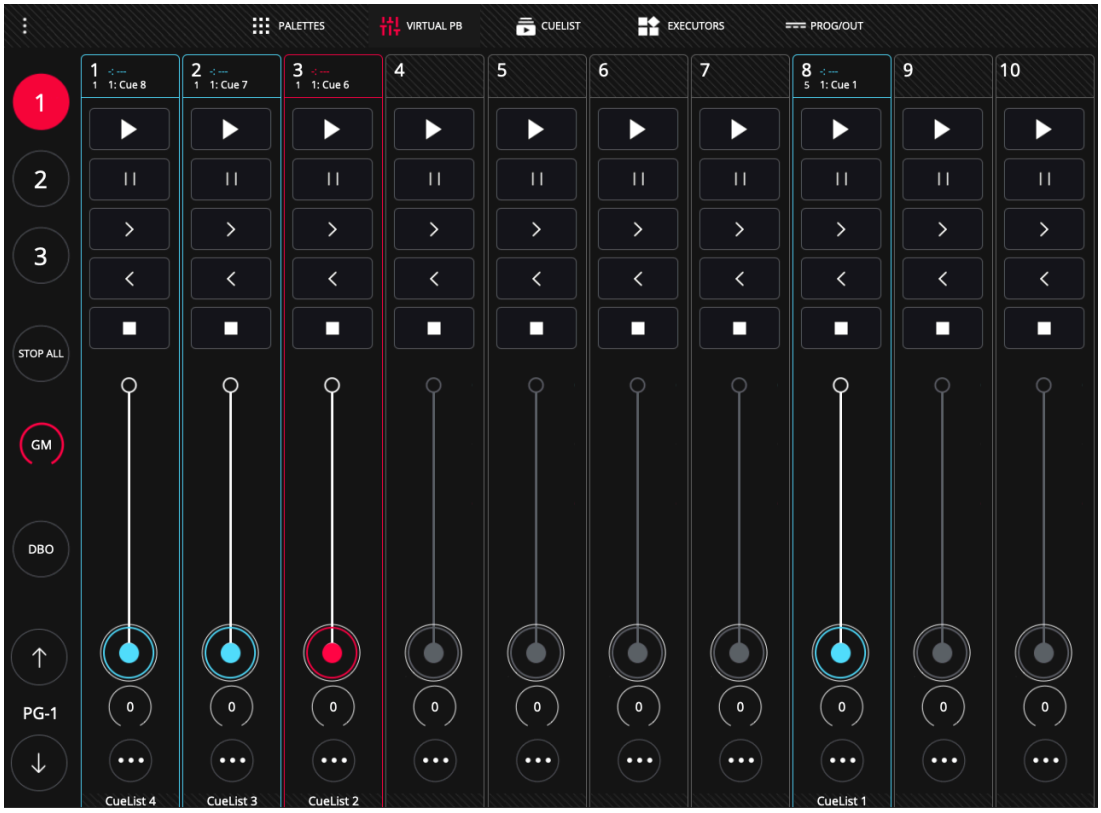
It is possible to configure several options that determine how the Playback and the elements that compose it work. It is possible to determine the priority of the Playback, the way in which it is reproduced, and the control functions of FX.

You can enter the playback options via the “3 dot” icon that appears when the playback is maximized. These options are discussed in detail in Section 4 of this manual.



Virtual Playback

From the "Virtual PlayBacks" view you can have access to the Playbacks, it is very useful when using a LS-Core or when no physical control surface is available.



LightShark's interface is multi-touch, so you can operate multiple Playbacks simultaneously from one tablet or any device with this technology. From the buttons the user can directly access the desired Wing without scrolling.

Playbacks can have 3 states:

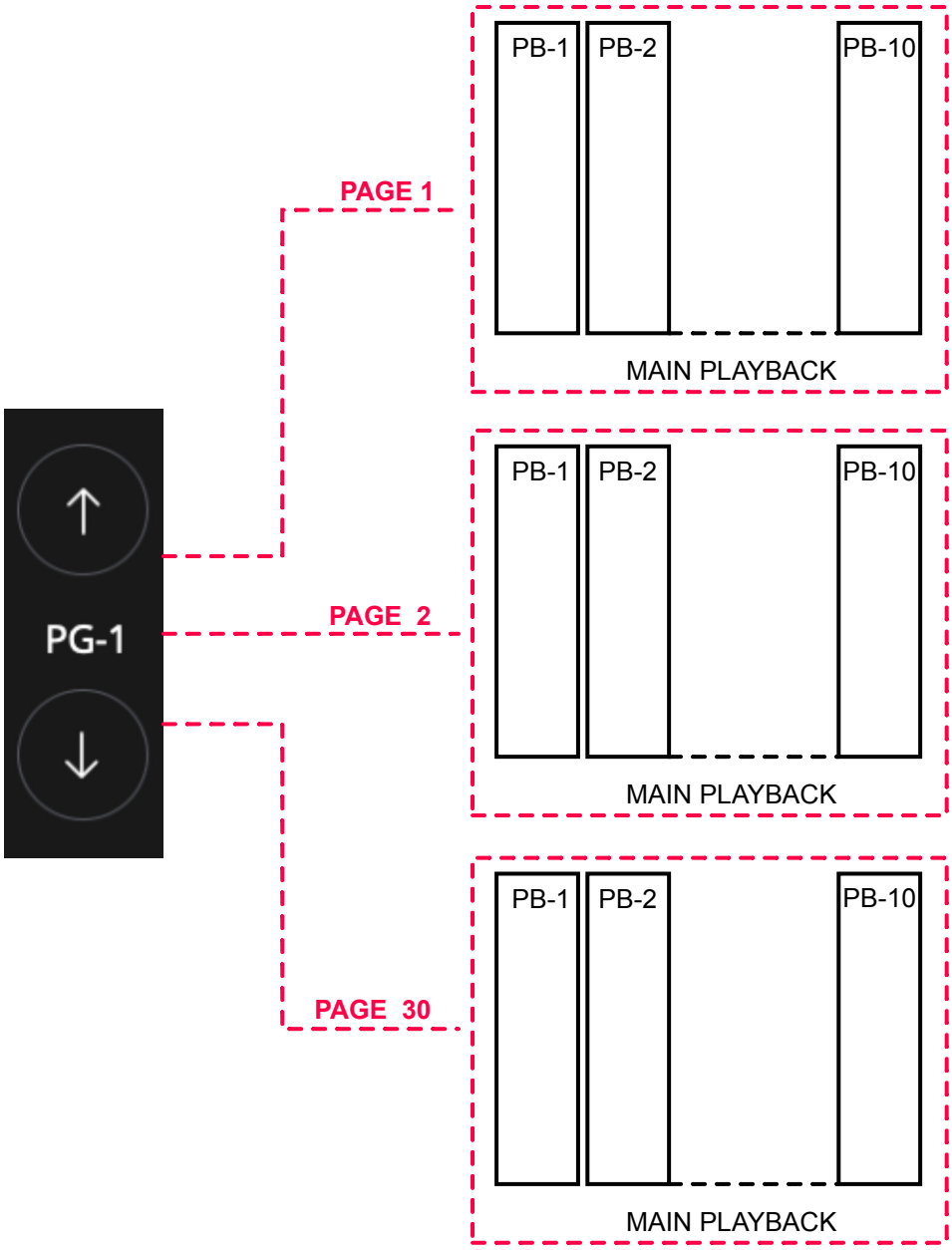
Empty: When no Cuelist is assigned they are shown in grey. It is the default state, when starting a show from 0 all Playbacks are empty.

Used: When a Cuelist is assigned it is shown in Blue.

Selected: When selected, it is shown in Red.

The pages allow the user to predefine some presets of Cuelist through the playbacks, so they can be loaded quickly at any time.

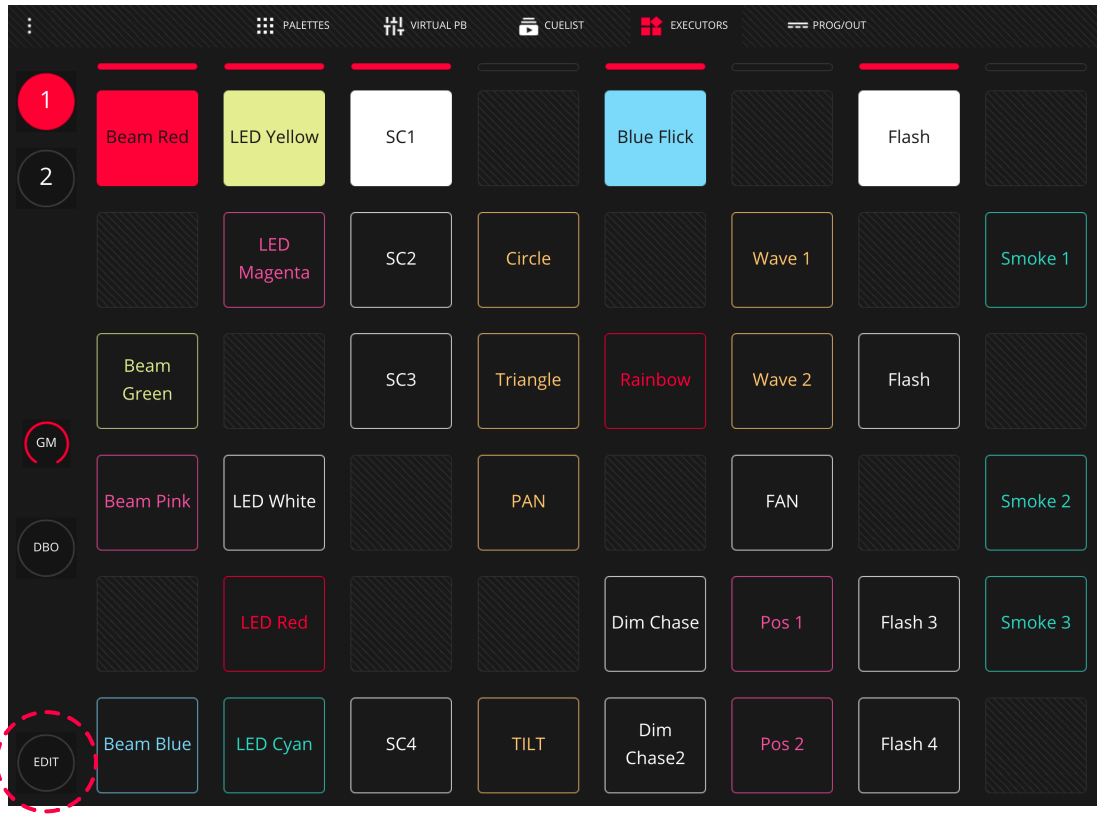
LighShark supports up to 30 Playback pages, allowing physical and virtual faders to have different functions and behaviors depending on which page they are on. As a general rule, one page per song is used.

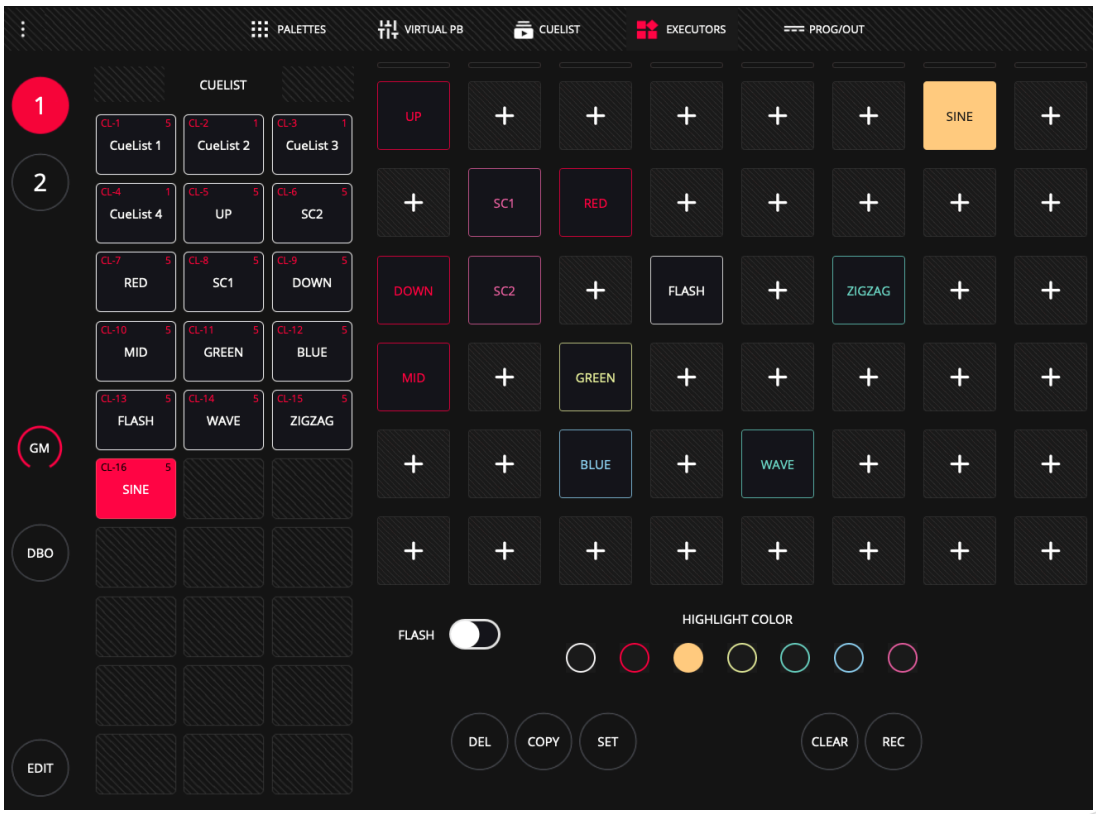


With the UP and DOWN buttons you can navigate between the pages. Between the two buttons is the label indicating the current page.

3.10 Use of Executors

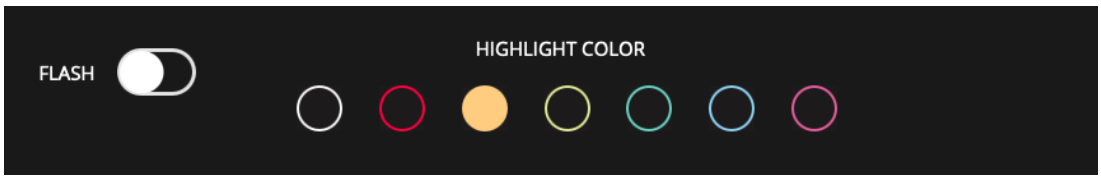
From the executor window the user can configure a custom Layout to trigger the Cuelist. To add or remove Cuelists from the executors window press the "Edit" button.





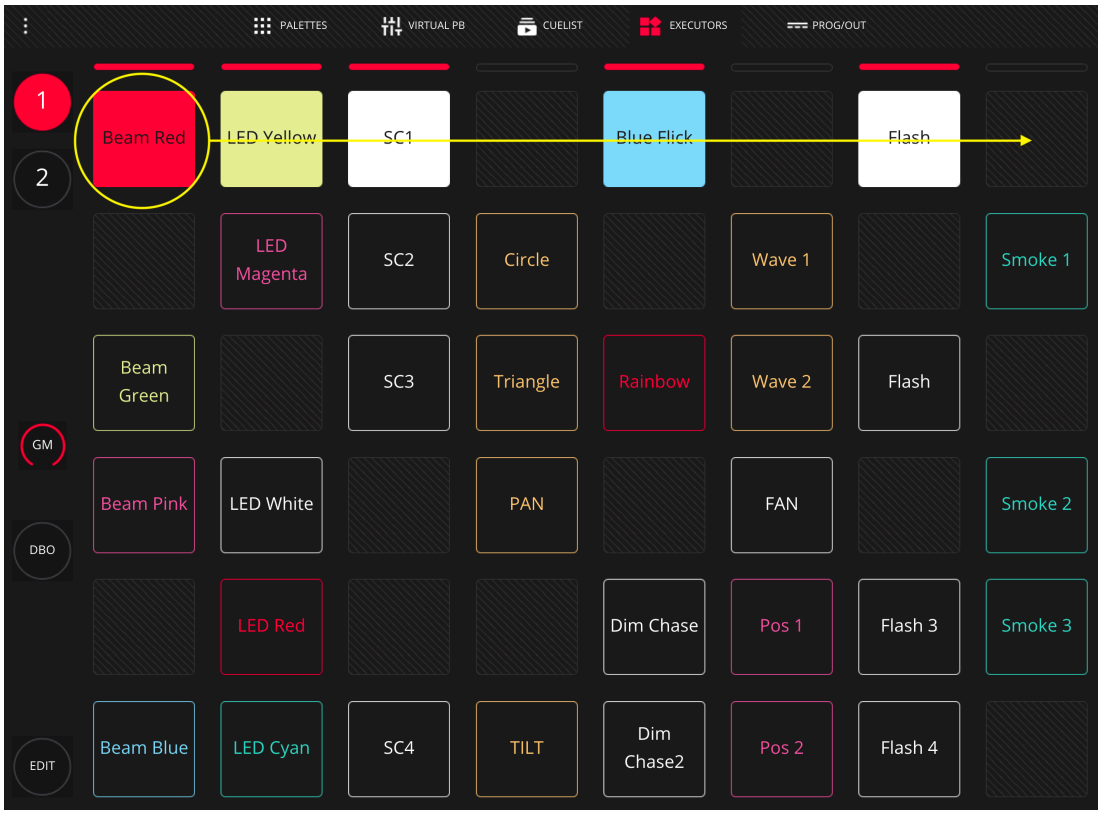
The executor window is composed by an 8x6 button matrix. Each of the 8 vertical columns can play 1 single Cuelist at the same time, so selecting a Cuelist from the same column deselects the previous one.

The user can modify the color of each of the buttons in the matrix, this way it is possible to visually distinguish each of the buttons and assign a color depending on their characteristics.



It is possible to configure each button as "Flash" or as "Toggle", with Flash creating a momentary button, and Toggle creating a latching button.

When sliding the finger horizontally on a row of executors all the Executors of that row are launched, deactivating the rest.



Add Cuelist

Cuelists can be copied to the Executors window as follows:

1 In the Executors window click on the "Edit" button.

2 On the left side select the Cuelist you want to add and press the "COPY" button and then select an empty box.

3 Click the "Set" button and then select the box you just created to rename it.

Removing a Cuelist from the Executors Window.

Cuelists can be removed from the Executors window as follows:

1 In the Executors window press the "Edit" button.

2 Press the "DEL" button and then select the box you want to empty.

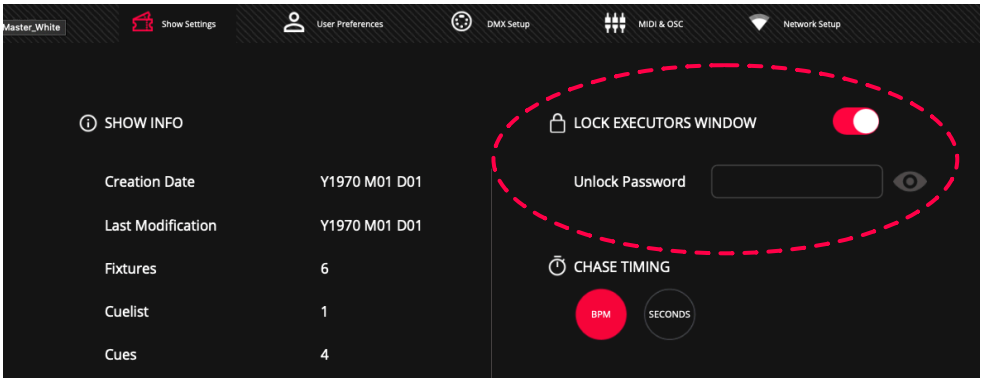
Locking the Executors Window

LightShark allows the blocking through password, of the window of executors, this way the user can block a show so that when connecting a new user can only have access to the executors. This function can be very interesting in those fixed installations or places where there is not a technician constantly.

To activate this function the steps are as follows:

1 Open the LightShark main menu

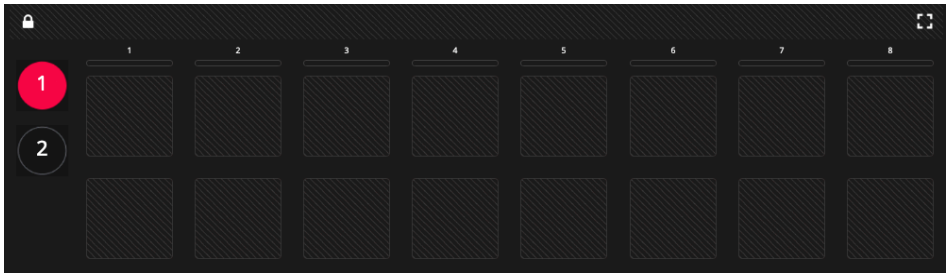
2 In the SHOW SETTINGS window, activate the option "LOCK EXECUTORS WINDOW".



3 Enter a login password.

NOTE Don't forget that password, otherwise you won't be able to unlock the show file.

4 Reload the web page. Each time a device connects it will be redirected to the executors window.

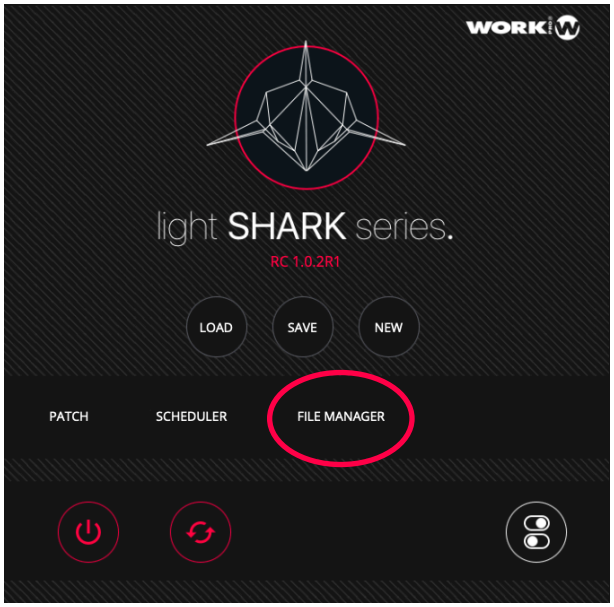


5 To exit the lock mode, click on the padlock icon at the top left. Then enter the password you have previously set.

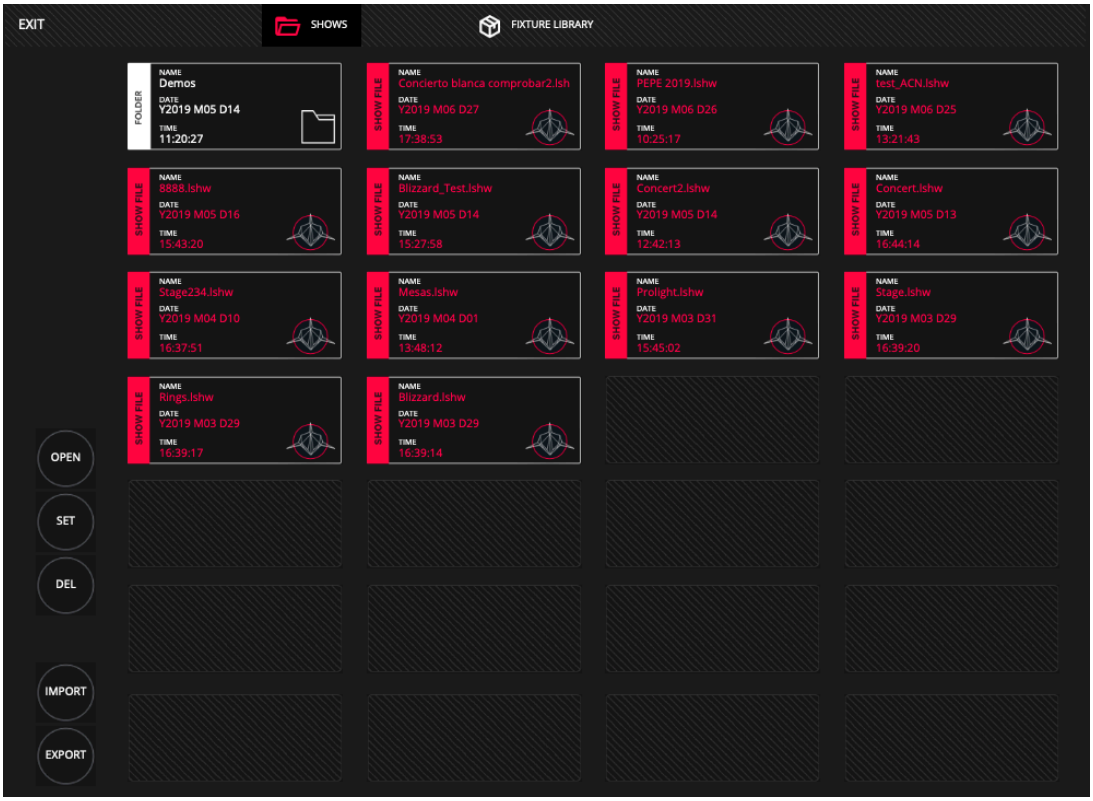
3.11 File Manager

LightShark includes a File Manager with which the user can manage the files contained in the console. In this way it is possible to import, export, and/.or delete different types of files.

To access the File Manager access the lightShark menu through the icon in the upper left corner.



When you access the File Manager, the shows tab is always displayed, from this window you can see all the show files that are in the console.



On the left side are the buttons needed to manage any type of file.

OPEN: To open software update files.

SET: To rename files.

DEL: To delete files.

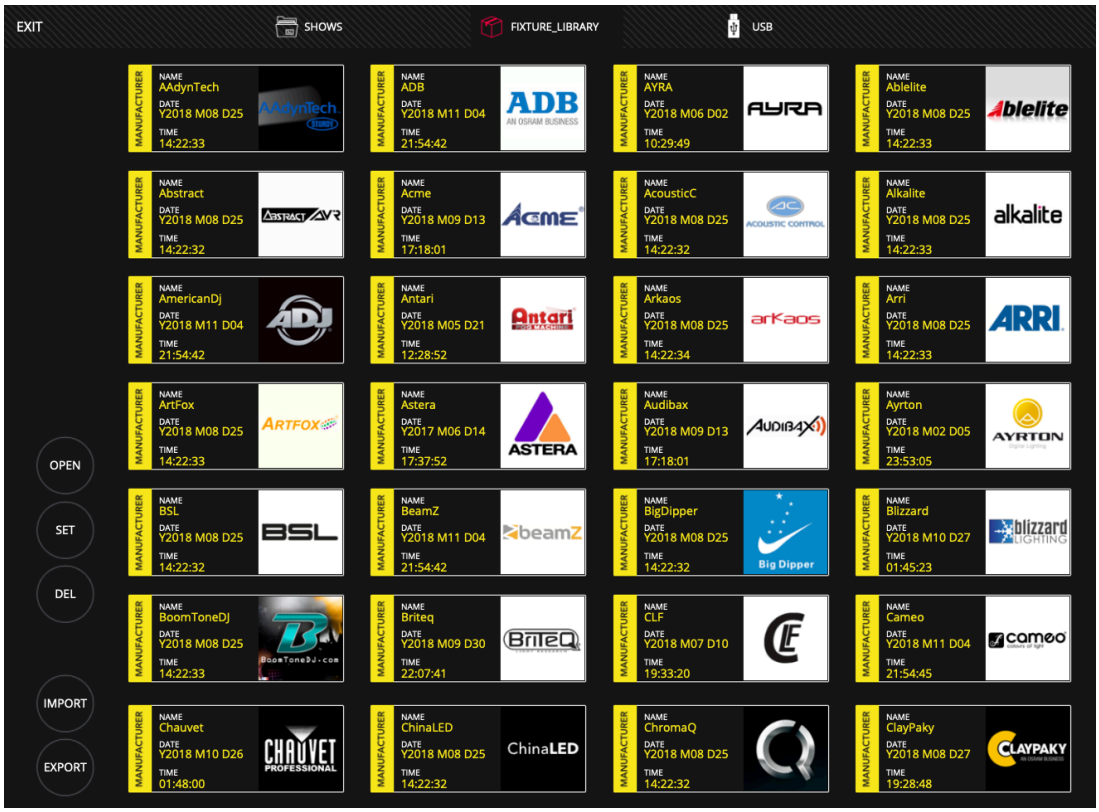
IMPORT: To import files from a USB memory stick to the console.

EXPORT: To export files from the console to a USB memory stick.

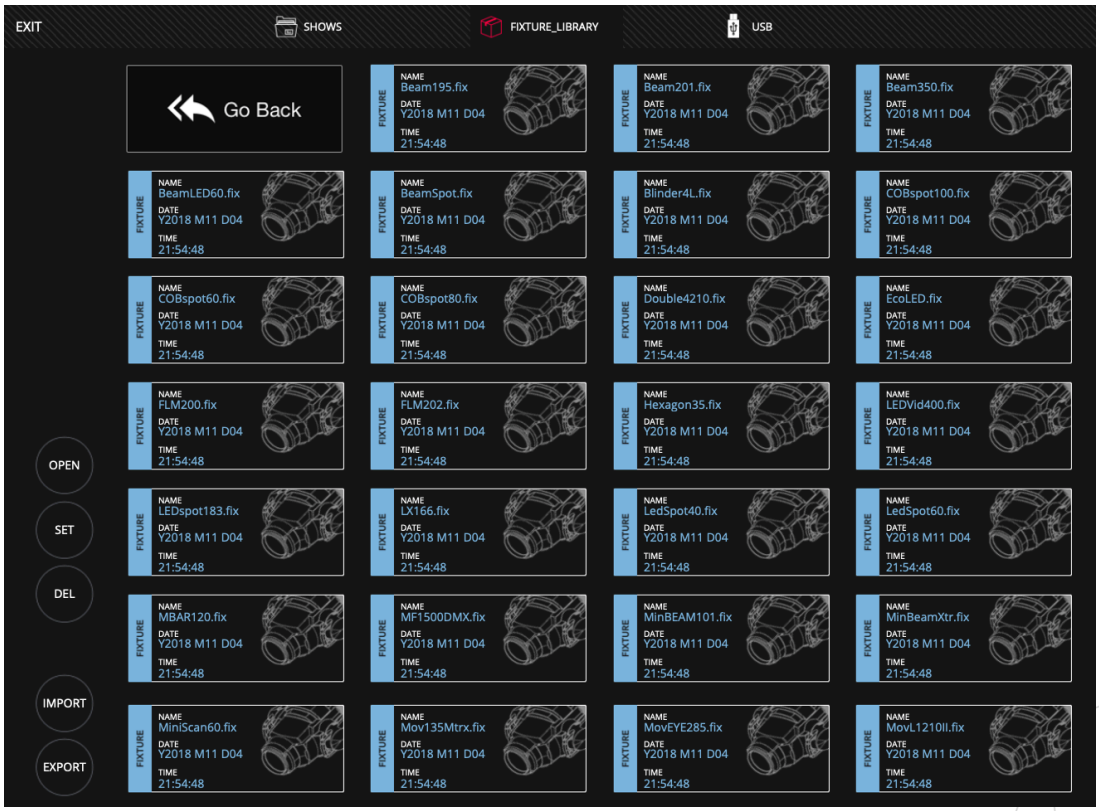
The "USB" tab is only displayed when an external USB memory stick is connected. This memory must be FAT16 or FAT32 formatted.

If lightshark does not detect the USB memory, make sure it is correctly formatted.

From the "FIXTURE_LIBRARY" tab you can access the fixture libraries loaded in the console.



To navigate between the different manufacturers you must scroll up. To see the fixtures that a manufacturer contains “double click” on the icon of the manufacturer.



Double click on the "GO BACK" icon to return to the list of manufacturers.

Export a library package from a manufacturer

It is possible to export a complete pack of profiles from a specific manufacturer. For example, if you want to export all the fixtures created by the user:

1 Connect a USB memory stick to the Data port

2 Go to the File Manager and select the "FIXTURE_LIBRARY" tab.

3 Scroll to the manufacturer "USER".

4 Press "EXPORT" and then select "USER".

5 LightShark will display a message confirming that the fixture package has been successfully exported.

Exporting a Fixture Profile

It is possible to export only one fixture:

1 Connect a USB memory stick to the Data port

2 Go to the File Manager and select the "FIXTURE_LIBRARY" tab.

3 Scroll to the manufacturer "USER" and double click on the icon.

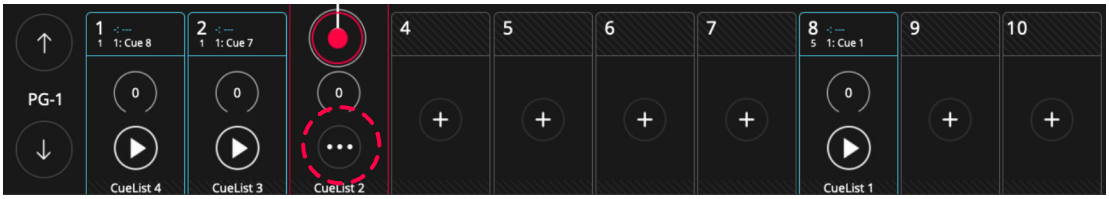
4 Click "EXPORT" and then select the fixture you want to export.

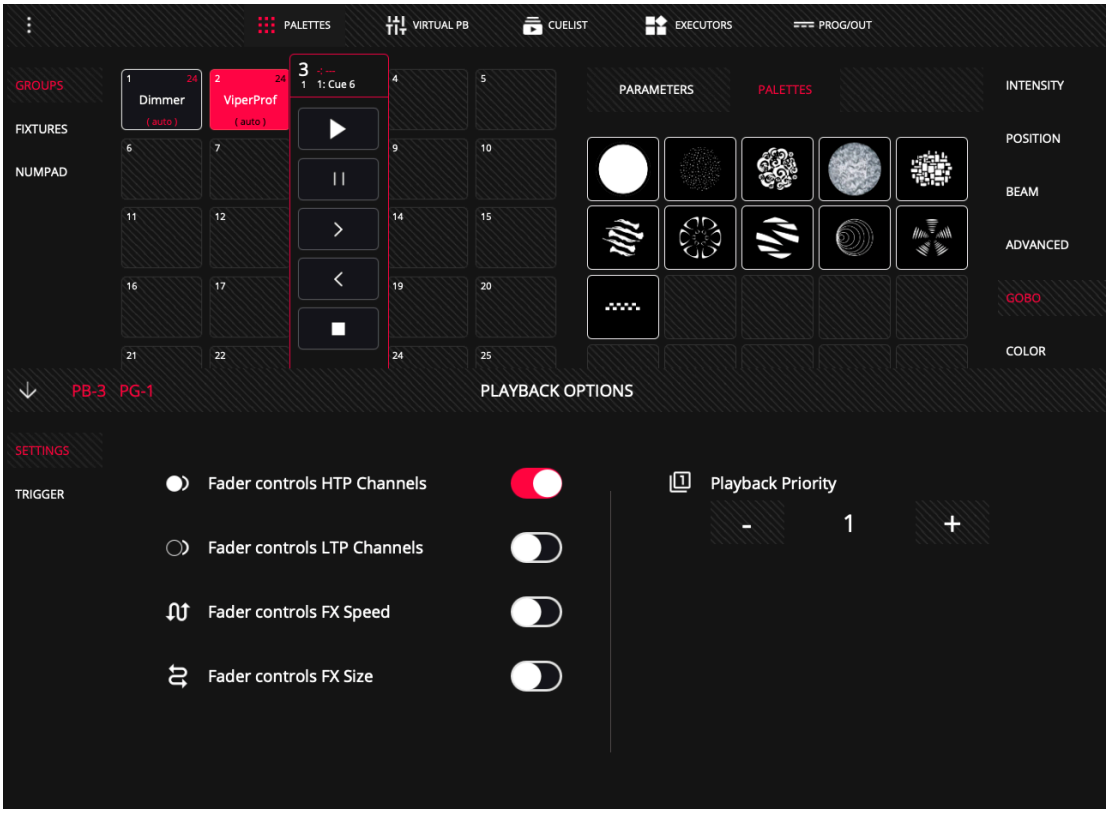
5 LightShark will show a warning confirming that the fixture file has been exported correctly.

Section 4: Playback Options

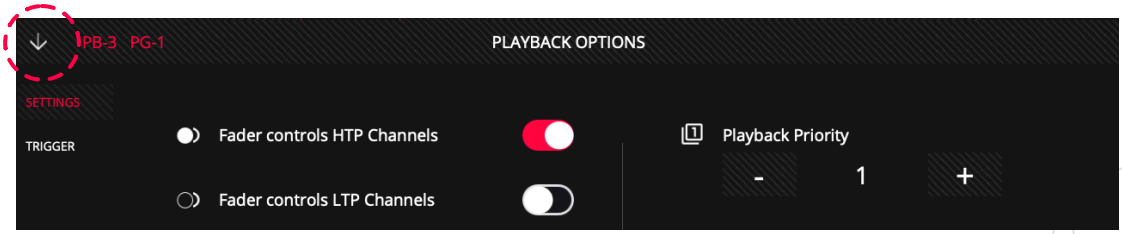
4.1 Playback Options

It is possible to configure several options that determine how the Playback and the elements that compose it work. It is possible to determine the priority of the Playback, the way in which it is reproduced, and the control functions of FX:





To hide the Playback options menu you should press the upper left arrow on the panel.

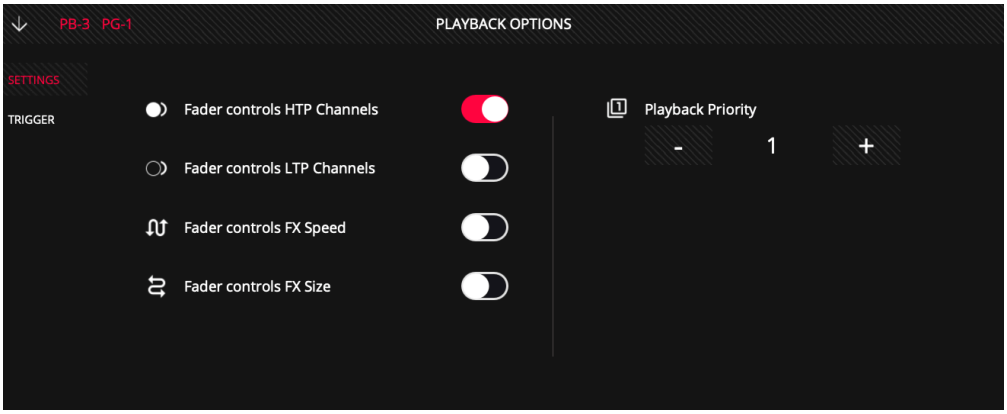


Fader Controls HTP Channels: When this function is activated the playback fader proportionally controls the level of all HTP channels of the current Cue from 0% to 100%. This option is activated by default.

Fader Controls FX Speed: When this function is activated, the playback fader can be used to scale the FX speed. When the fader is at 100% then the Fx speed has the same value as when the Cue was recorded, lowering the fader reduces the speed until the speed is equal to 0 when the fader is completely down.

Fader Controls FX Size: When this function is activated the playback fader can be used to scale the FX size. When the fader is at 100% then the FX Size has the same value as when the Cue was recorded, lowering the fader reduces the size of the FX until the size equals 0 when the fader is fully down.

Playback Priority: Playbacks are played based on the most recent action determining the value of a parameter in a device. By using different priority levels the user can modify this behavior.



4.2 Trigger Options

Fader UP+GO: When the fader passes the limit defined in the "trigger level" field, the playback is activated and the associated Cuelist is played. When this function is deactivated the fader does not activate the Cuelist automatically.

Fader at Zero + Release: When the fader has a value lower than the limit defined in the "trigger level" field the playback is deactivated. When this function is deactivated the fader does not deactivate the Cuelist automatically.

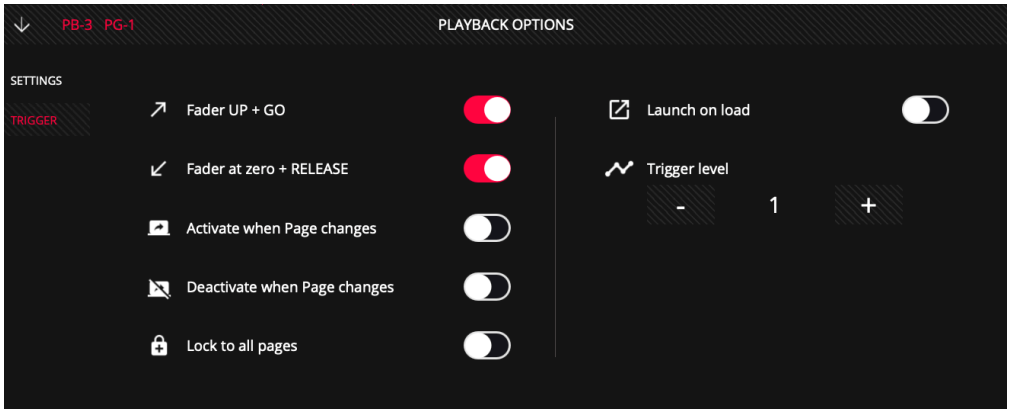
Activate when Page Changes: If this option is set, the Playback is activated when the page is changed to the one that the cuelist is assigned. If there was a Cuelist already active on that playback, then changing the page to the one where the cuelist is set to “Activate When Page Changes”, will NOT activate the cuelist, unless the option "Deactivate when page changes" was activated in the previous Playback.

Deactivate when Page Changes: If this option is activated the Playback is deactivated if you change to any other page.

Lock to all Pages: If this option is enabled then the selected Playback will be present on all 30 Playback pages.

Trigger Level: This field defines the exact value of the fader at which Playback is activated or deactivated.

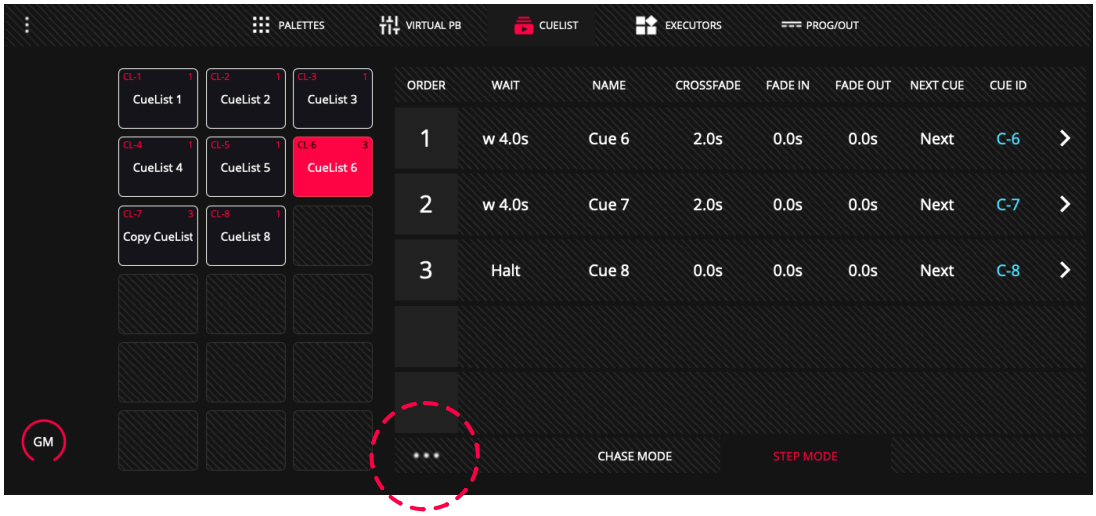
Launch on Load: If this option is enabled, the Playback will be executed immediately after the show is loaded.

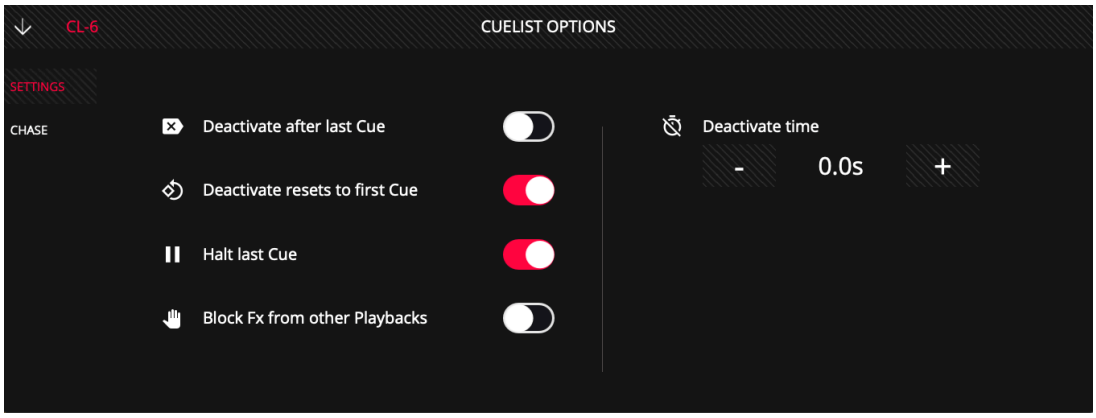


Section 5: Cuelist Options

5.1 Playback Options

It is possible to configure the way a Cuelist works from the Cuelist options menu. To access the options menu you must select the Cuelist first, then access the options menu through the icon at the bottom left:





Deactivate after last Cue: When this option is activated the Cuelist is automatically deactivated after the last step in the Cuelist.

Deactivate resets to first Cue: When this function is activated the Cuelist always starts from the first step when the Cuelist associated to the playback is activated. When this function is deactivated and the user activates the Cuelist it will start from the step it was the last time it was deactivated.

Halt last Cue: When this option is activated the Cuelist stops at the last step. If the function is disabled the Cuelist will return to the first step after executing the last one.

Block FX from other Playbacks: When this option is active then any channel controlled by this playback blocks the FX for that channel in the other playbacks.

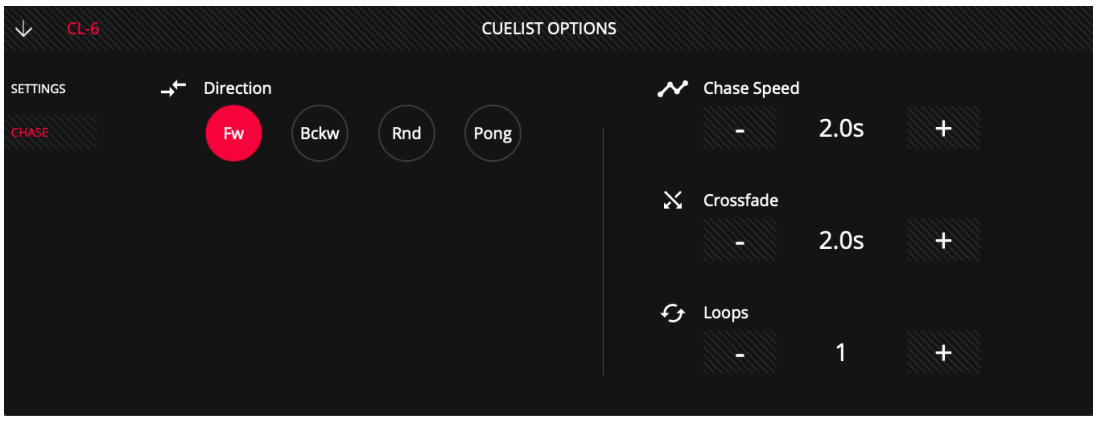
Direction: It is possible to choose between 4 options:

Up: moving from the first Cue to the last one in order.

Down: moving from the last Cue to the first one in order.

Random: scrolling all Cues randomly.

Pong: Moving from the first Cue to the last one in order, then continuing to play the cues backwards until it reaches the first. This pattern then continues until you stop the chase.



Chase Speed: It is possible to set the default Chase time for that particular Cuelist.

CrossFade: You can set the default CrossFade for that particular Cuelist.

Loops: It is possible to configure how many times the Chase execution has to be repeated before deactivating. The default setting is 0, which indicates that it will play infinitely.

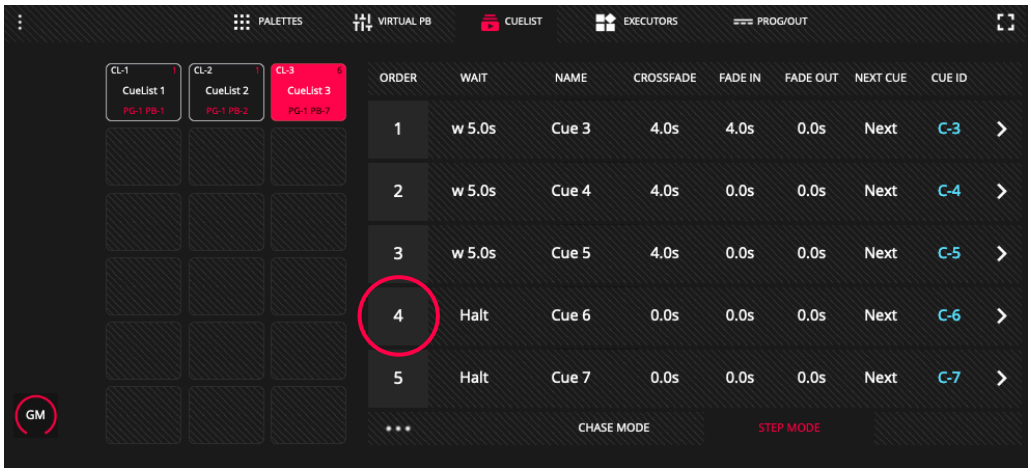
5.2 Organization of the Cues

It is possible to rearrange the Cues into a Cuelist:

1 Select the Cue you want to move
2 Press MOVE
3 Select the Cue that occupies the space to which you want to move the selected Cue.

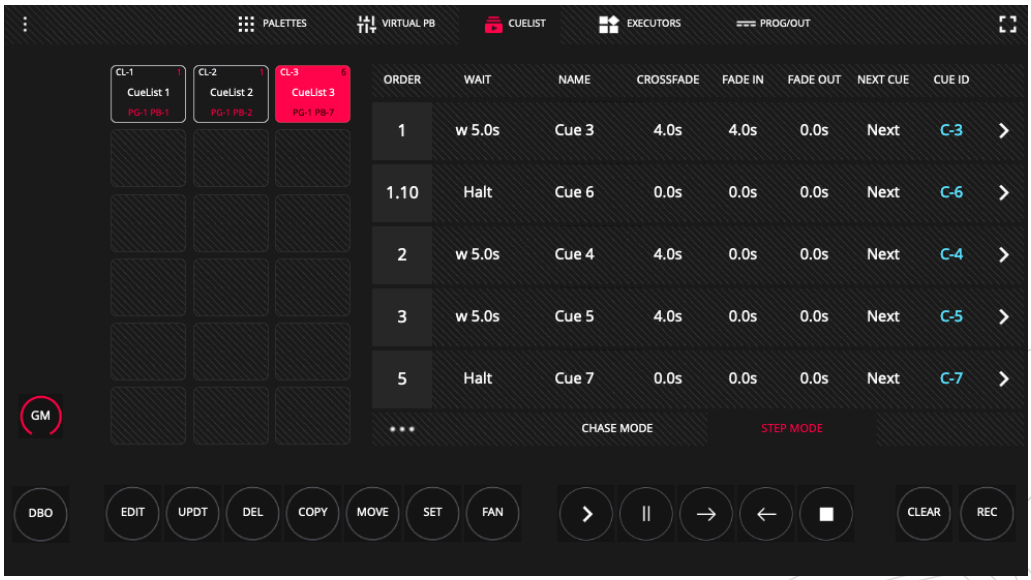
It is possible to create sub cues between 2 cues:

1 Press for 1 second on the Cue you want to move:



2 Enter the new position, indicating first the Cue number where you want to move the Cue followed by a point and the subcue order:

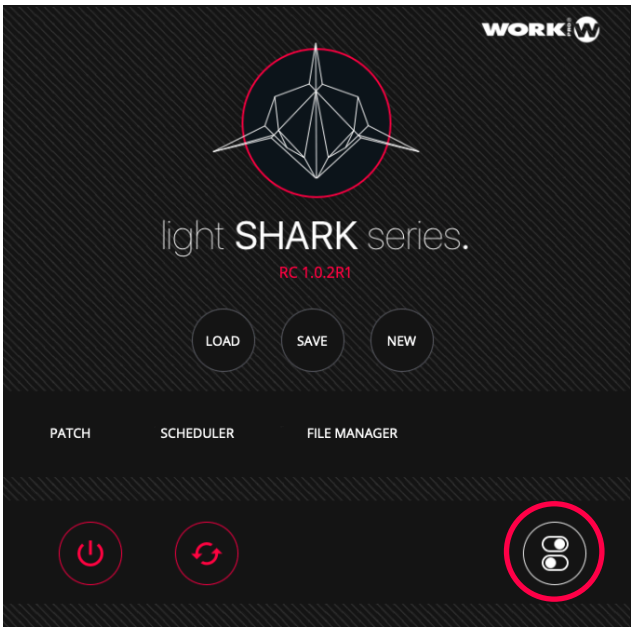
3 Press Ok.



Section 6: System Options

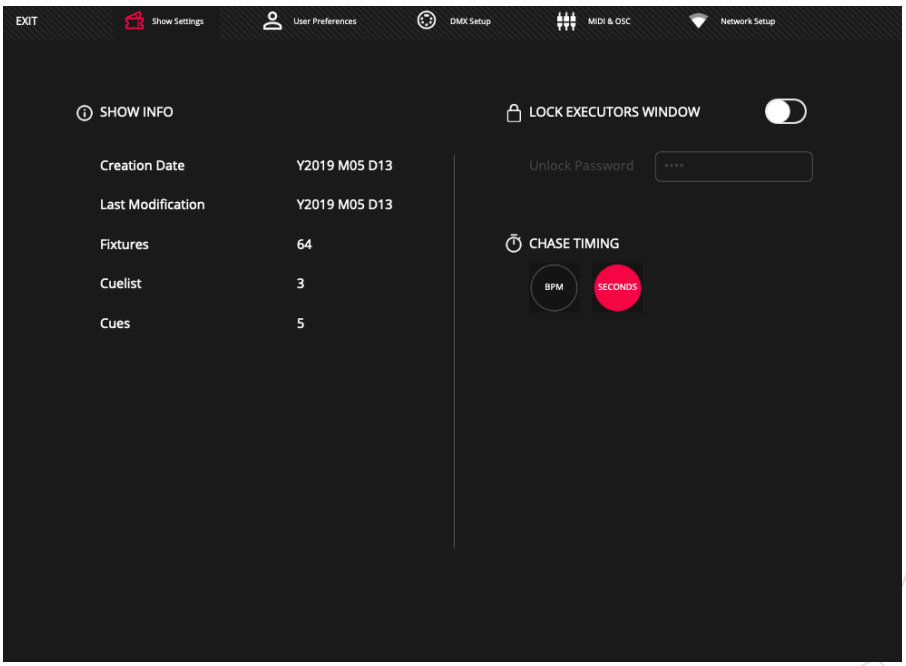
6.1 System Preferences

It is possible to configure certain lightShark settings or behaviors from the System Preferences.



The system preferences are divided into 5 sections:

Show Settings: From this window it is possible to configure the following options:



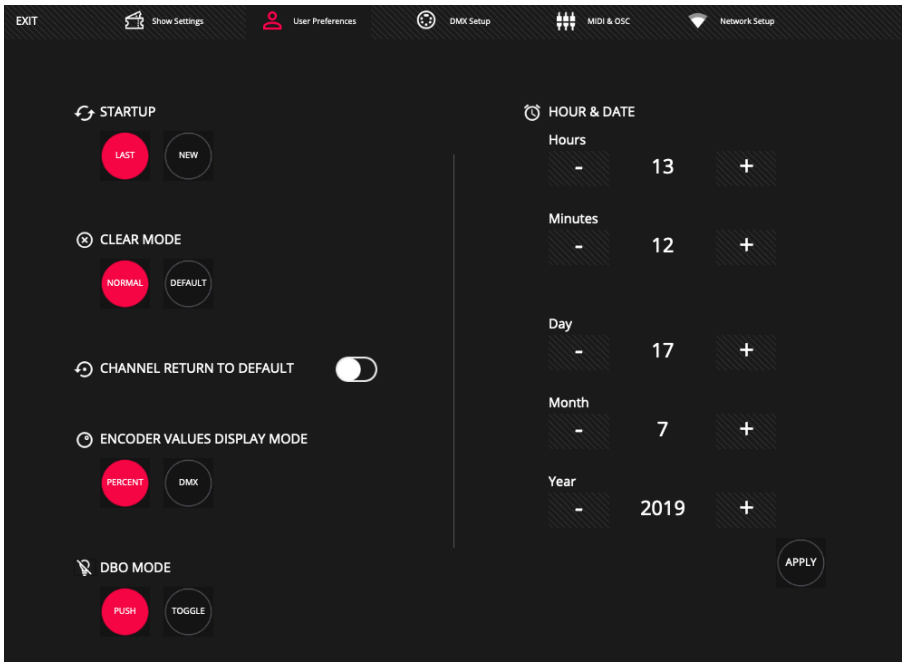
Show Info: It is possible to visualize the properties of the show file:

-Date of creation of the show file.
-Date of the last modification made.
-Number of Fixtures contained in the show.
-Quantity of Cuelist that there is inside the show.
-Quantity of Cues recorded.

Lock Executors Window: Used to activate or deactivate the lock mode of the executors window.

Chase Timming: It allows to visualize the times of the Playbacks configured as Chase in Seconds or in BPMs.

User Preferences: From this window it is possible to configure the following options:



StartUp: It is possible to decide whether at the beginning of lightShark the last used show will be loaded, or a new show will always be started.

Clear Mode: It is possible to change the behavior of "CLEAR" from the main menu by choosing between 2 modes:

Normal: The LTP channels stay “in the air” and the HTP are set to 0.

Default: The LTP and HTP channels return to the default values defined in the fixture library.

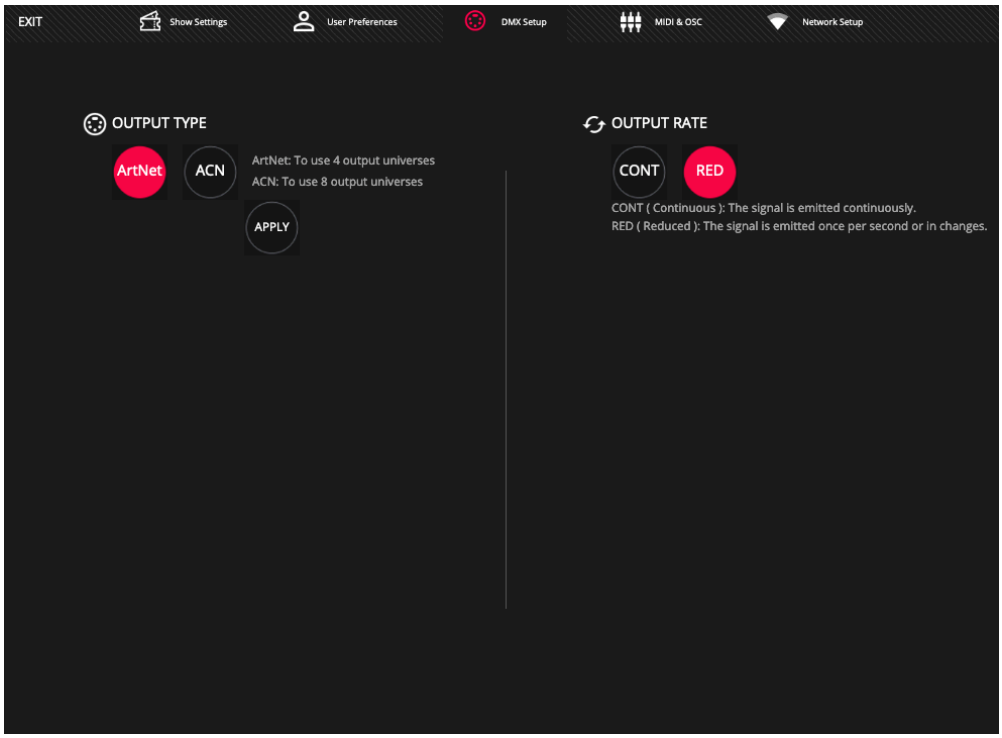
Channel Return to Default: When this option is activated, the channels that are not being used in the programmed or in some Playback or Executor return to the default values defined in the fixture library.

Encoder values display mode: It is possible to configure the type of values displayed.

DBO Mode: It allows to change the behaviour of the DBO button, choosing between push-button or toggle.

Time and Date: Allows you to set the date and time of the system.

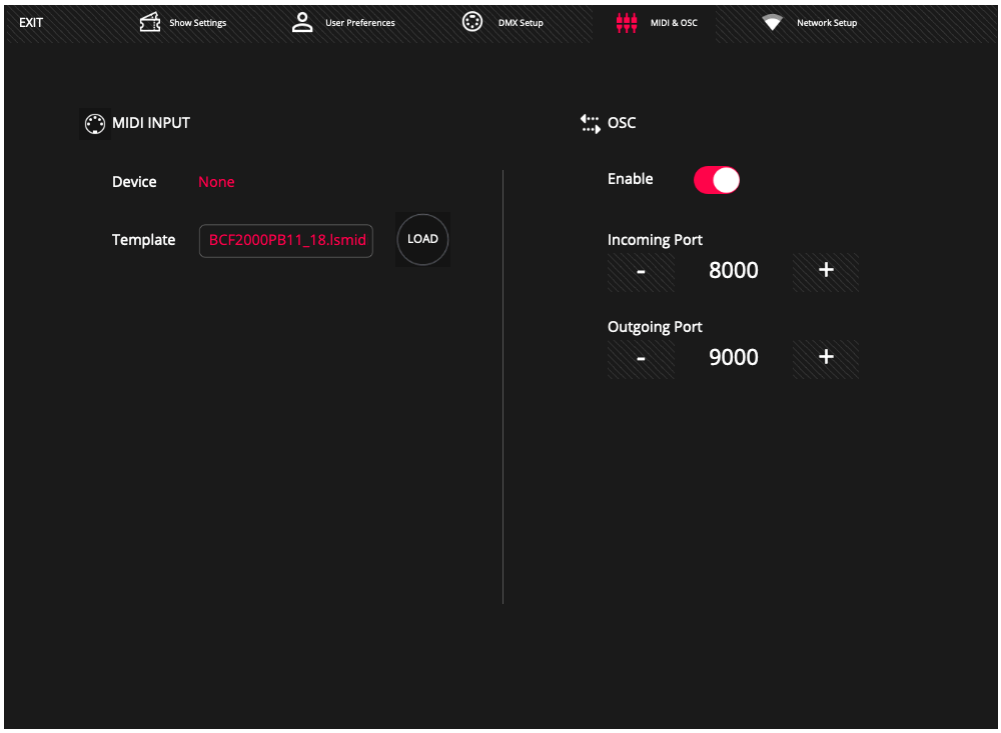
DMX Setup: From this window it is possible to configure the DMX output settings.



Output Type: Allows you to adjust the DMX output network protocol. Art-Net allows the use of up to 4 DMX output universes while ACN (sACN) allows the use of up to 8 DMX output universes.

Output Rate: Configure the output frame rate to improve compatibility with other devices.

MIDI & OSC: From this window you can configure the MIDI and OSC connectivity settings.



MIDI Input: Select the configuration file for the MIDI controller you want to control.

OSC: You can enable or disable OSC control. In addition, the user can define the input & output port.

6.2 Network Settings

The ethernet port has 2 different IP addresses, so it is possible to connect lightShark devices to multiple networks using the same physical connection:

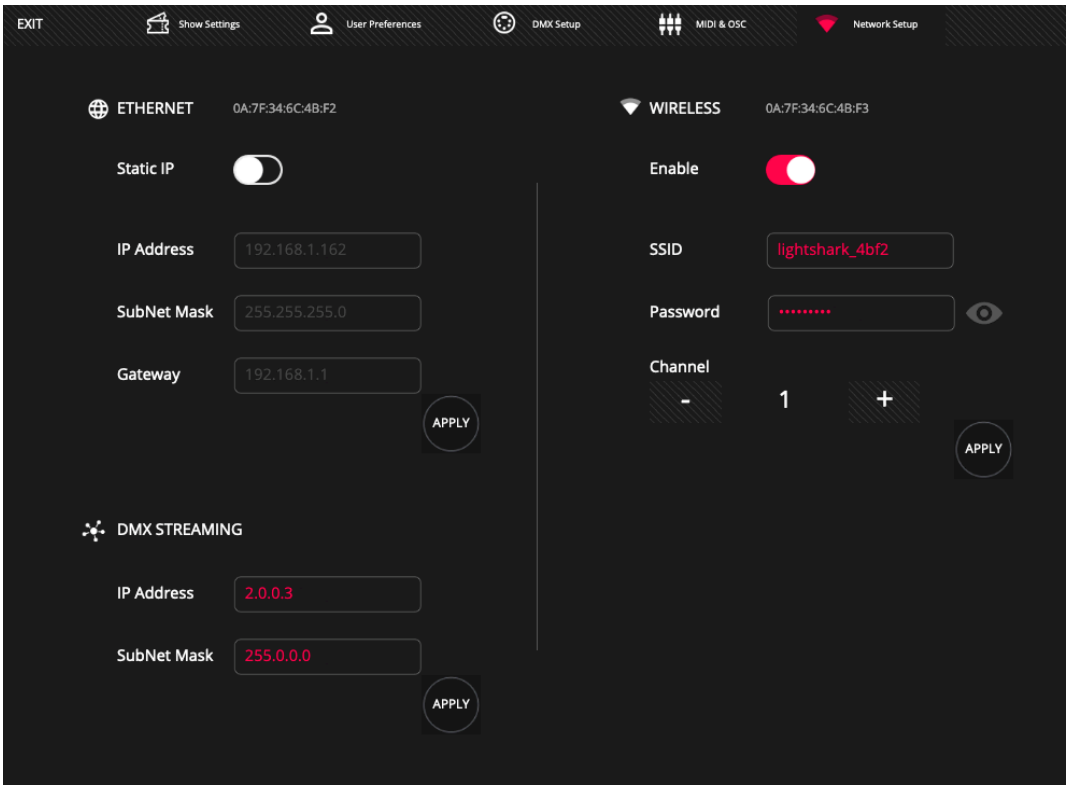
Ethernet: Allows connection to the local area network shared with other devices. It can be configured in either manual or automatic (DHCP) mode. By default it is configured with a static IP.

DMX Streaming: Allows the transmission of DMX through Art-Net or sACN. By default it is configured to be able to communicate to a Class A IP address scheme in the 2.x.y.z range.

The default address for lightShark devices is 2.0.0.1 and the subnet mask 255.0.0.0 . This allows Art-Net devices to communicate directly to lightShark without the need for a DHCP server connected to the network.

This allows you to control lightShark from the same network where there are other devices (sound consoles, control software. etc) and at the same time emit DMX to the Nodes that require a specific network configuration according to the protocol used.

To connect to lightShark through ethernet you must configure the IP address of your device in the same subnet.



Wireless: Enables configuration of the integrated access point in lightShark devices. By default the network name is lightshark_XXXX, where XXXX refers to the last 4 digits of the MAC Address of the lightShark wireless interface.

The default password for all lightShark devices is "**sharkjaws**". For security reasons it is recommended that you change the default password through this menu.

The password length should be between 8 and 63 ASCII characters and no spaces should be used.

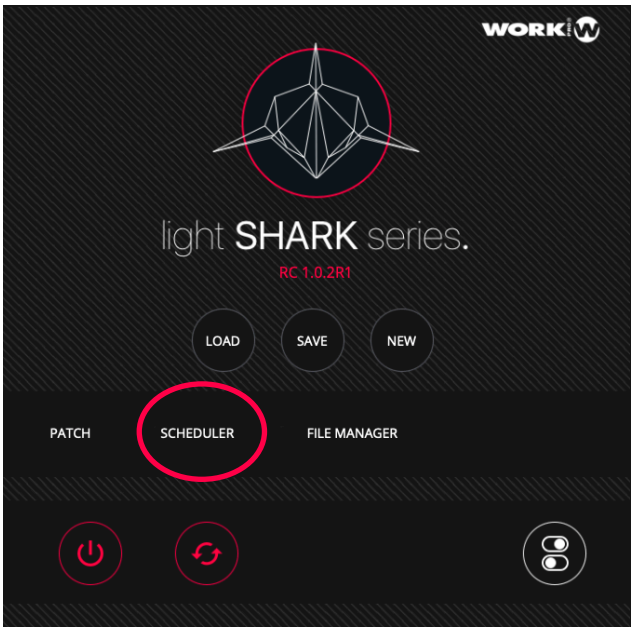
Through the channel selector the user can select different frequencies (channels) of the WiFi network to avoid problems like: Low speed, unstable signal, loss of signal and disconnections.

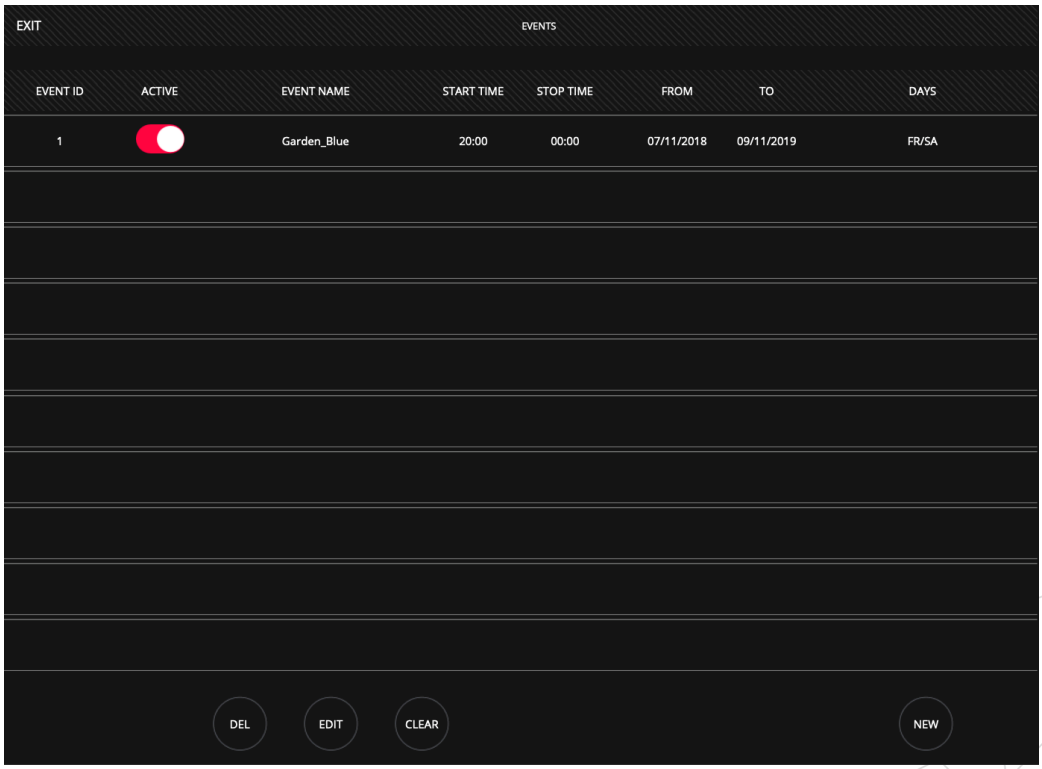
The use of a wireless network analyzer program is recommended before deciding on the appropriate channel.

6.3 Event Scheduler

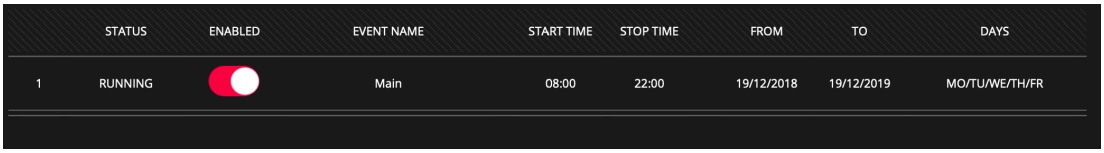
In situations where lightShark is managing a space (a meeting room, a small auditorium, attractions, party halls, clubs. etc) it is possible to control the lighting of these spaces according to the calendar, to automatically trigger actions to specific dates and times.

To access the event scheduler, access the lightShark menu and select "SCHEDULER".





The "EVENTS" window displays a summary of scheduled calendar events.



Status: LightShark assigns an identifier to each event.

Active: If you want to cancel the execution of an event during a period of time, you can deactivate the event without having to delete it.

Event Name: You can assign a name to quickly identify each of the events in the list.

Start Time: Indicates the moment in which the event is activated.

Stop Time: Indicates the moment when the event is deactivated.

From: Indicates the start date from which the event will be executed.

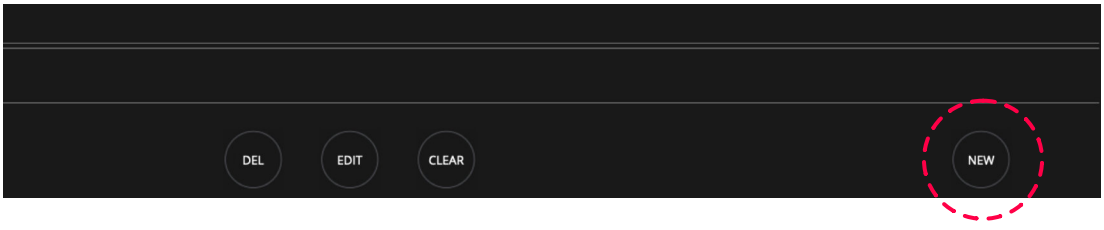
To: Indicates the end date from which the event will stop being executed.

Days: It is possible to filter or select certain days within the selected time period.

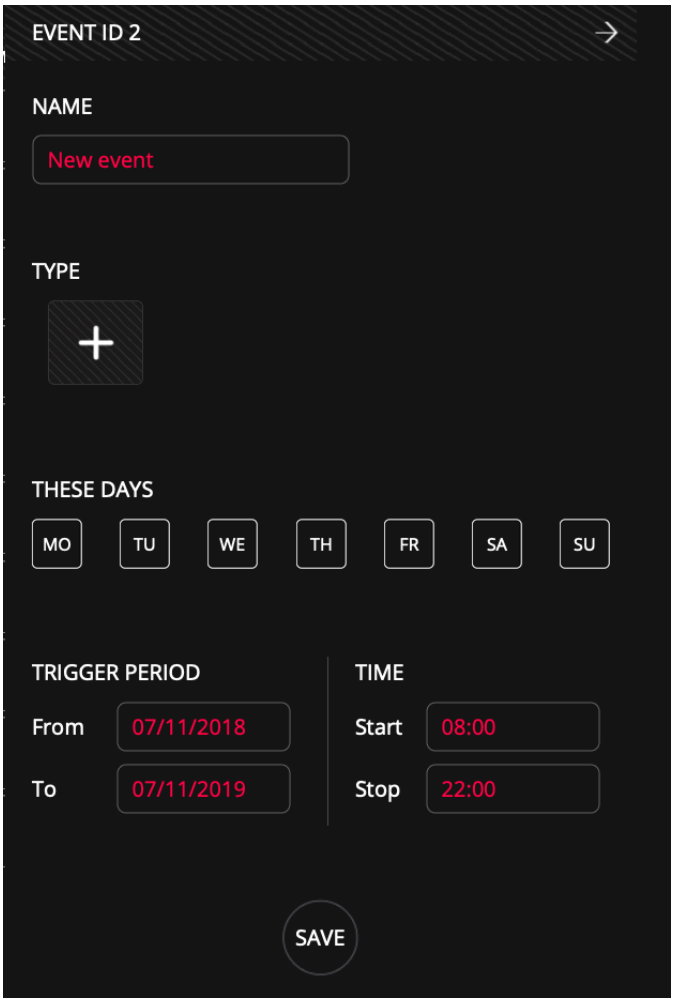
Create a new event

The process for adding a new event to the calendar is as follows:

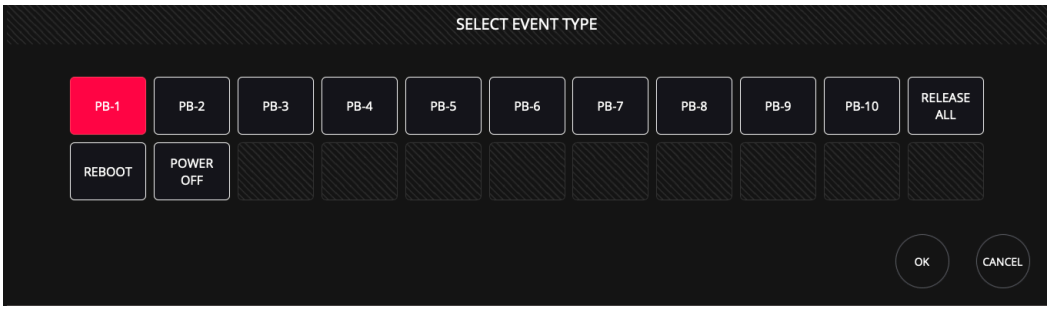
1 At the bottom press the "NEW" button to add a new event to the list.



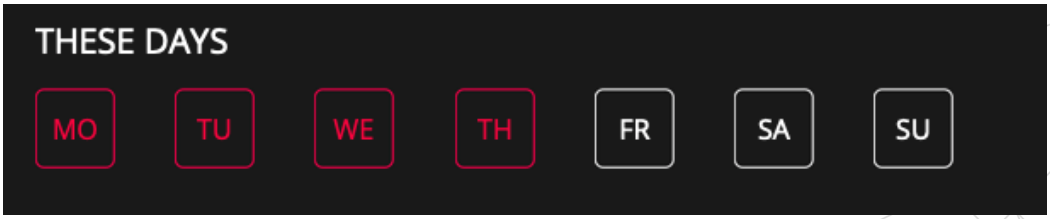
2 LightShark will display a configuration panel where the user can define the behavior of the event. Hold down the "NAME" field for two seconds to add a description of the event.



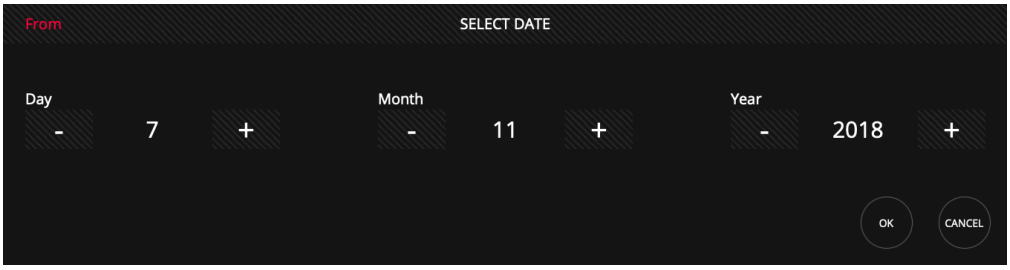
3 Under "TYPE" click on the empty box and then select the action you want to perform.



4 Then select which days of the week the event will run.



5 Define the start and end date of the event by holding down the date field for two seconds.



6 Define the start and stop time by holding down the date field for two seconds.

7 Press "SAVE" to save the changes.

It is possible to delete or edit an existing event by using the "DEL" or "EDIT" buttons respectively.

Section 7: Connectivity

7.1 MIDI

LightShark supports plug and play of MIDI devices via USB. These devices can be connected and put into operation while the lightShark is running.

If you use a MIDI interface connected to lightShark, you can use a template to setup the configuration of MIDI devices. There are a number of default templates created for different controllers, but you can also create MIDI templates as needed.

There are included templates for the following devices:

Akai APC-20

Akai APC-Mini

Elation MidiCon

Behringer BCF2000

Korg Nano Kontrol2

Novation LaunchKey

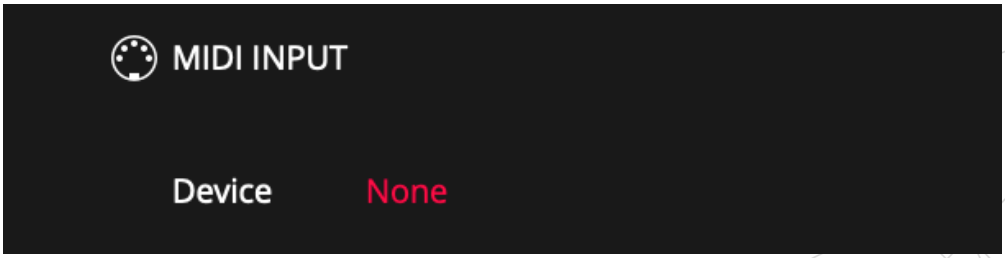
Novation LaunchPad

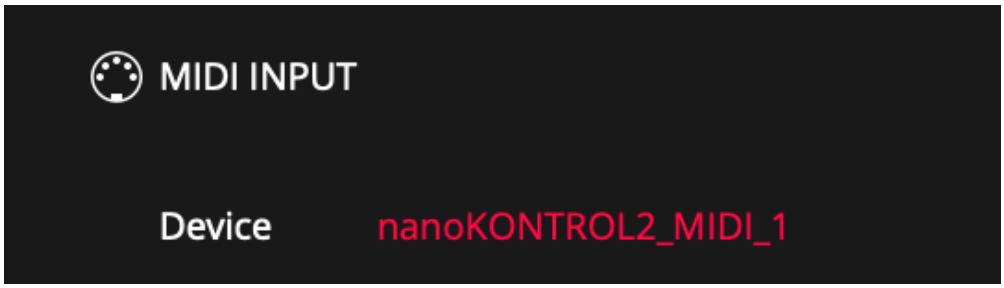
You can use this configuration information to use apps or MIDI sending devices, such as video servers or audio consoles, to control lightShark.

To use your MIDI controller you must connect it via USB to the USB Host port (on the LS-Core) or the USB "Data" port (on the LS-1).

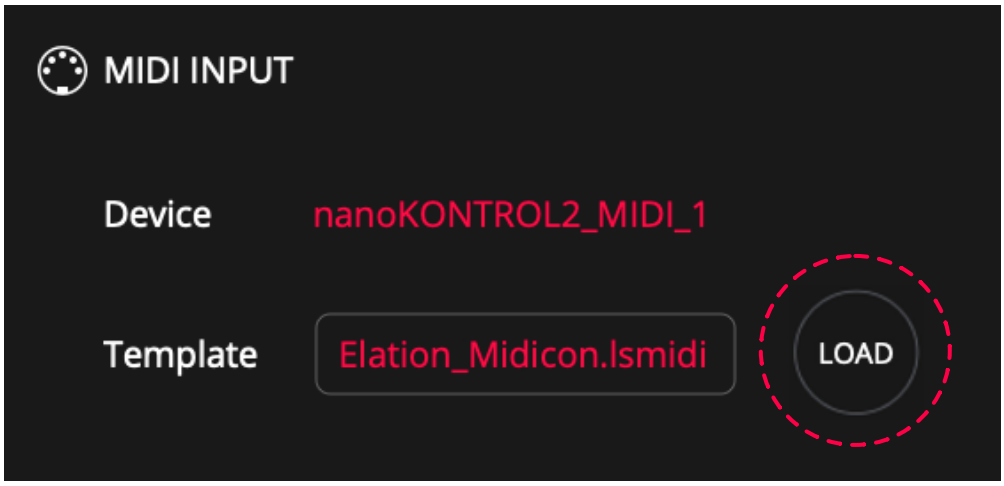
1 Once the MIDI controller is connected, open the MIDI & OSC Setup window.

2 When the MIDI device is connected, wait 5 seconds and lightShark will display the device information in the "DEVICE" field. If the field says "None" check the device connection and if the connected MIDI controller is USB compliant.





3 Then select the configuration template for the connected MIDI controller. Press the "LOAD" button



4 Pressing "LOAD" will display the file browser, in which you can select the template you want to use.

All functionalities of lightShark can be assigned to a MIDI note:

Function	Command
Page Up	BUTTON_PAGEUP
Page Down	BUTTON_PAGEDOWN
DBO	BUTTON_DBO
Delete	BUTTON_DEL
Copy	BUTTON_COPY
Fan	BUTTON_FAN
Move	BUTTON_MOVE
Set	BUTTON_SET
Update	BUTTON_UPDT
Edit	BUTTON_EDIT
Playback Selection Button for PB1	BUTTON_SELECT1
Playback Selection Button for PB30	BUTTON_SELECT30
Playback “Go” Button for PB1	BUTTON_GO1
Playback “Go” Button for PB30	BUTTON_GO30
Playback “Flash” Button for PB1	BUTTON_FLASH1
Playback “Flash” Button for PB30	BUTTON_FLASH30
Playback “Pause” Button for PB1	BUTTON_PAUSE1
Playback “Pause” Button for PB30	BUTTON_PAUSE30
Playback “Next” Button for PB1	BUTTON_NEXT1
Playback “Next” Button for PB30	BUTTON_NEXT30
Playback “Previous” Button for PB1	BUTTON_PREV1
Playback “Previous” Button for PB30	BUTTON_PREV30
Playback “Release” Button for PB1	BUTTON_REL1
Playback “Release” Button for PB30	BUTTON_REL30
Master Go	BUTTON_GOMASTER
Master Pause	BUTTON_PAUSEMASTER
Master Next	BUTTON_NEXTMASTER
Master Previous	BUTTON_PREVMASTER
Master Release	BUTTON_RELMASTER
Find	BUTTON_FIND
Clear	BUTTON_CLEAR
Record	BUTTON_REC

Function	Command
Executor X1 Y1	BUTTON_EXECUTOR_01_01
Executor X1 Y6	BUTTON_EXECUTOR_01_06
Executor X16 Y1	BUTTON_EXECUTOR_16_1
Executor X16 Y6	BUTTON_EXECUTOR_16_6
Executor Page Up	EXECUTOR_PAGEUP
Executor Page Down	EXECUTOR_PAGEDOWN
Master Fader Level	master=”true”
Playback 1 Level	playback_number=”1”
Playback 30 Level	playback_number=”30”
Intensity Parameter Control	BUTTON_DIM
Position Parameter Control	BUTTON_POS
Color Parameter Control	BUTTON_COL
Advanced Parameter Control	BUTTON_ADVANCED
Beam Parameter Control	BUTTON_BEAM
Gobo Parameter Control	BUTTON_GOBO
FX Parameter Control	BUTTON_FX

Templates for MIDI controllers are XML files that can be modified by the user according to their needs. Examples are shown below (the blue values are the MIDI notes sent by the controller). Examples:

Assigning a MIDI Note to the Go Button on PB3

```
<BUTTON octave="0" note="29" on_press="true" on_release="true" mode_value='True'
action="BUTTON_GO3" />
```

Assign a MIDI note to the PB7 Flash button

```
<BUTTON octave="0" note="35" on_press="true" on_release="true" mode_value='True'
action="BUTTON_FLASH7" />
```

Assigning a MIDI Note to the Flash Button

```
<BUTTON octave="0" note="12" on_press="true" on_release="true" mode_value='True'
action="BUTTON_FLASH7" />
```

Assigning a MIDI Note to the Color Settings Button

*<BUTTON octave="1" note="10" on_press="true" on_release="true" mode_value='True' action="**BUTTON_COL**" />*

Assigning a MIDI note to Encoder 1

*<ENCODER octave="0" note="13" up_only="True" down_only="False" action="**ENCODER1**" />*

*<ENCODER octave="0" note="14" up_only="false" down_only="True" action="**ENCODER1**"/>*

Assign a MIDI note to the Master

*<FADER octave="0" note="9" master="true" action="**FADER_MASTER**"/>*

Assign a MIDI note to the PB-3 fader

<FADER octave="0" note="8" playback_number="3" />

7.2 OSC

Open Sound Control (OSC) is a protocol for communication between computers, music synthesizers and other multimedia devices, inspired by modern network technology.

The protocol has some advantages such as the independance of the transmission medium and the flexibility to transport any type of data.

OSC can be transported by various protocols, but UDP is commonly used.

LightShark can receive OSC commands from the wired network interface and from the wireless network interface.

From the LightShark website you can download a sample layout for TouchOSC.

TouchOSC is a modular OSC control surface for Android and iOS. It supports sending and receiving Open Sound Control messages via Wi-Fi.

Control	Cmd	Element	Parameter	Example
Page Up	/LS/Page/Up	-	0 = Released 1 = Pressed	-
Page Down	/LS/Page/Down	-	0 = Released 1 = Pressed	-
DBO	/LS/DBO	-	0 = Released 1 = Pressed	-
Edit	/LS/Edit	-	0 = Released 1 = Pressed	-
Update	/LS/Update	-	0 = Released 1 = Pressed	-
Delete	/LS/Delete	-	0 = Released 1 = Pressed	-
Copy	/LS/Copy	-	0 = Released 1 = Pressed	-
Move	/LS/Move	-	0 = Released 1 = Pressed	-
Set	/LS/Set	-	0 = Released 1 = Pressed	-
Fan	/LS/Fan	-	0 = Released 1 = Pressed	-
Find	/LS/Find	-	0 = Released 1 = Pressed	-
Clear	/LS/Clear	-	0 = Released 1 = Pressed	-
Rec	/LS/Rec	-	0 = Released 1 = Pressed	-
Playback Selection	/LS/Select/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To select the Playback number 9: /LS/Select/PB/9
Playback Go	/LS/Go/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Go on Playback number 9: / LS/Go/PB/9
Playback Flash	/LS/Flash/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Flash on Playback 9: /LS/Flash/PB/9
Playback Stop	/LS/Stop/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Stop on Playback 9: /LS/Stop/PB/9
Playback Prev	/LS/Prev/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Prev on Playback 9: /LS/Prev/PB/9
Playback Next	/LS/Next/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Next on Playback 3: /LS/Next/PB/3
Playback Pause	/LS/Pause/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Pause on Playback 1: /LS/Pause/PB/1
Playback Fader Level	/LS/Level/PB/[x]	[x]= Playback Number From=1 To=30	From = 0 To = 255	To Adjust Fader Level on PB 17: /LS/Level/PB/17
Main Playback Go	/LS/Go/Main	-	0 = Released 1 = Pressed	-
Main Playback Stop	/LS/Stop/Main	-	0 = Released 1 = Pressed	-
Main Playback Prev	/LS/Prev/Main	-	0 = Released 1 = Pressed	-
Main Playback Next	/LS/Next/Main	-	0 = Released 1 = Pressed	-
Main Playback Pause	/LS/Pause/Main	-	0 = Released 1 = Pressed	-
Set GM Level	/LS/Level/GM	-	From = 0 To = 255	-
Encoders	/LS/Encoder/[x]	[x]= Encoder Selected From=1 To=4	From = -1 To = 1	To Adjust parameters using Encoder B: /LS/Encoder/2
Select Fixture	/LS/SelectFixture	-	0 = Released 1 = Pressed	-
Select Group	/LS/SelectGroup	-	0 = Released 1 = Pressed	-
Selection Next	/LS/SelectionNext	-	0 = Released 1 = Pressed	-
Selection Prev	/LS/SelectionPrevious	-	0 = Released 1 = Pressed	-

Control	Cmd	Element	Parameter	Example
Intensity	/LS/Intensity	-	0 = Released 1 = Pressed	-
Position	/LS/Position	-	0 = Released 1 = Pressed	-
Colour	/LS/Color	-	0 = Released 1 = Pressed	-
Beam	/LS/Beam	-	0 = Released 1 = Pressed	-
Advanced	/LS/Advance	-	0 = Released 1 = Pressed	-
Gobo	/LS/Gobo	-	0 = Released 1 = Pressed	-
Fx	/LS/Gobo	-	0 = Released 1 = Pressed	-
Executor Push Mode	/LS/Executor/[x]/[y]/[z]	x]= Executor Page From=1 To=2 [y]= Select X position From=1 To=8 [z]= Select Y position From=1 To=6	0 = Released 1 = Pressed	To Trigger Executor Position 2-2 **/LS/Executor/1/2/2**
Executor Toggle Mode	/LS/Executor/[x]/[y]/[z]	/LS/Executor/[x]/[y]/[z] [x]= Executor Page From=1 To=2 [y]= Select X position From=1 To=8 [z]= Select Y position From=1 To=6	0 = Released 0 = Pressed	-
Trigger Executor Row	/LS/ExecutorLine/[x]	[x]= Row Number From=1 To=6	0 = Released 1 = Pressed	-
Sync All	/LS/Sync	-	0 = Released 1 = Pressed	-
Sync Only Parameters	/LS/Sync/Playbacks	-	0 = Released 1 = Pressed	-
Sync Only Executors	/LS/Sync/Executors	-	0 = Released 1 = Pressed	-
Release All	/LS/StopAll	-	0 = Released 1 = Pressed	

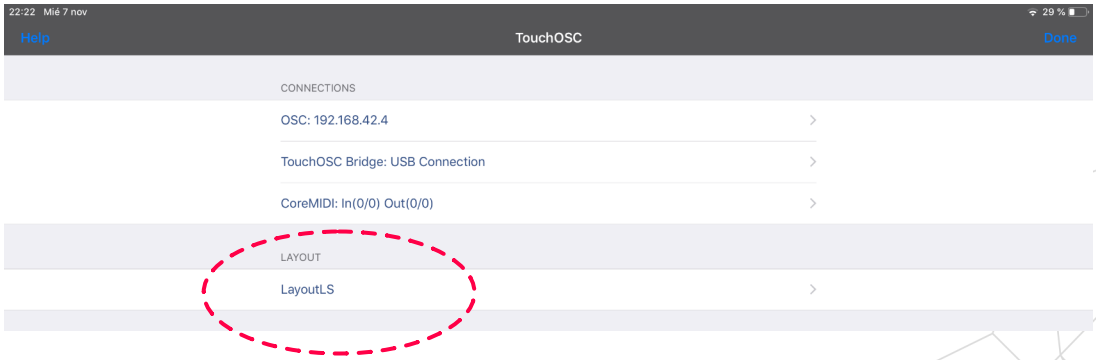
The commands in this table only need one parameter, floating type. If you need more information about this protocol you can visit:

http://opensoundcontrol.org/introduction-osc

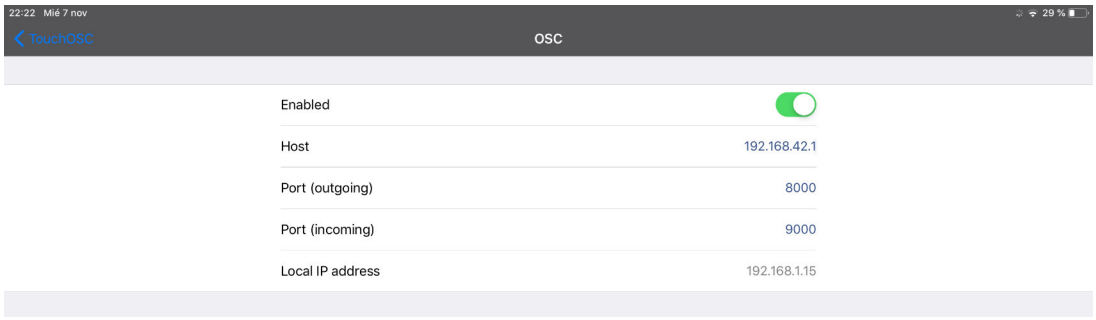
How to control lightShark using TouchOSC

1 Connect the iPad to the WiFi network generated by lightShark .

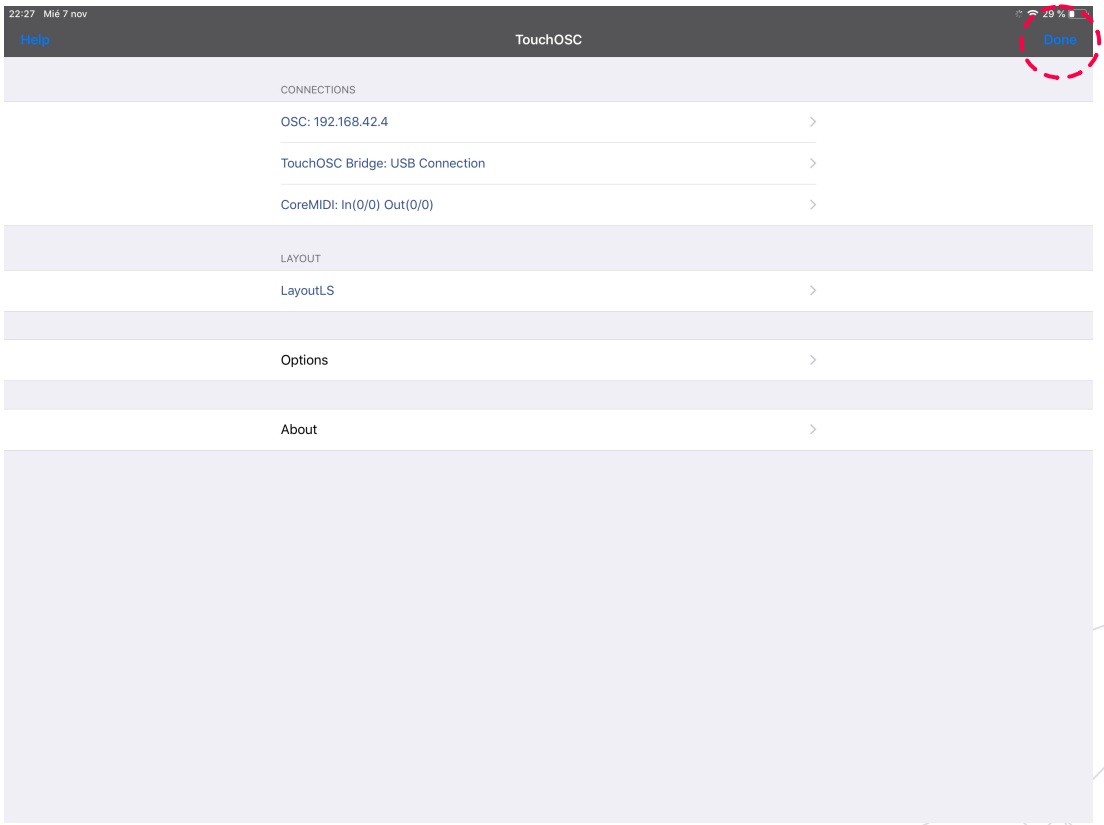
2 Start the TouchOSC App and select the Layout for lightShark.



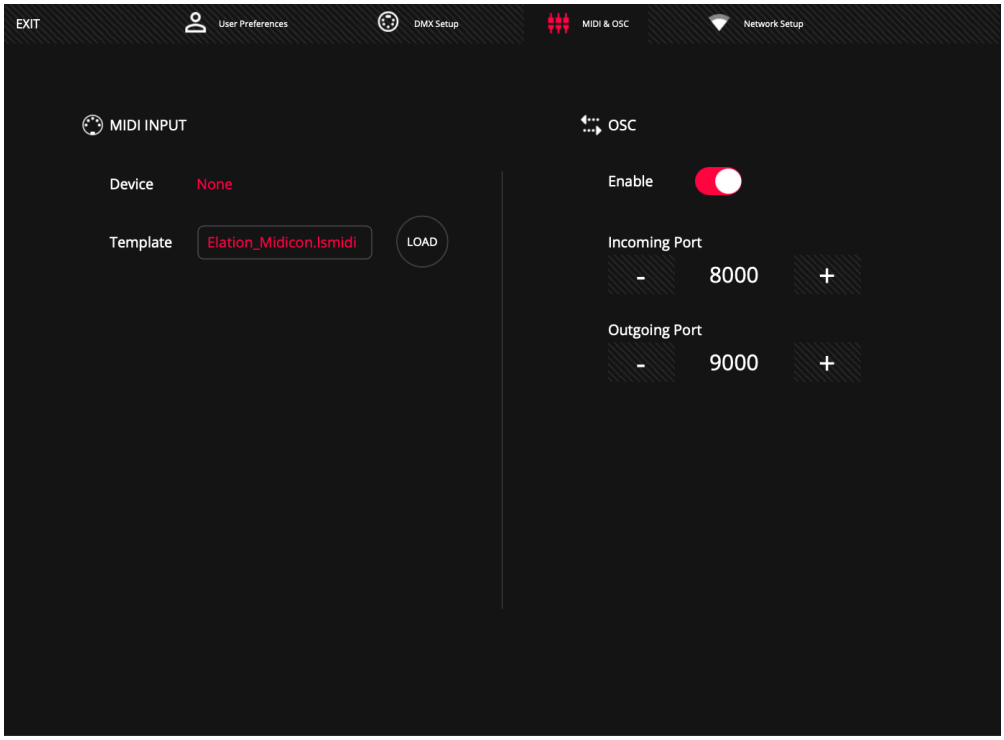
3 Configure the connection settings as follows.



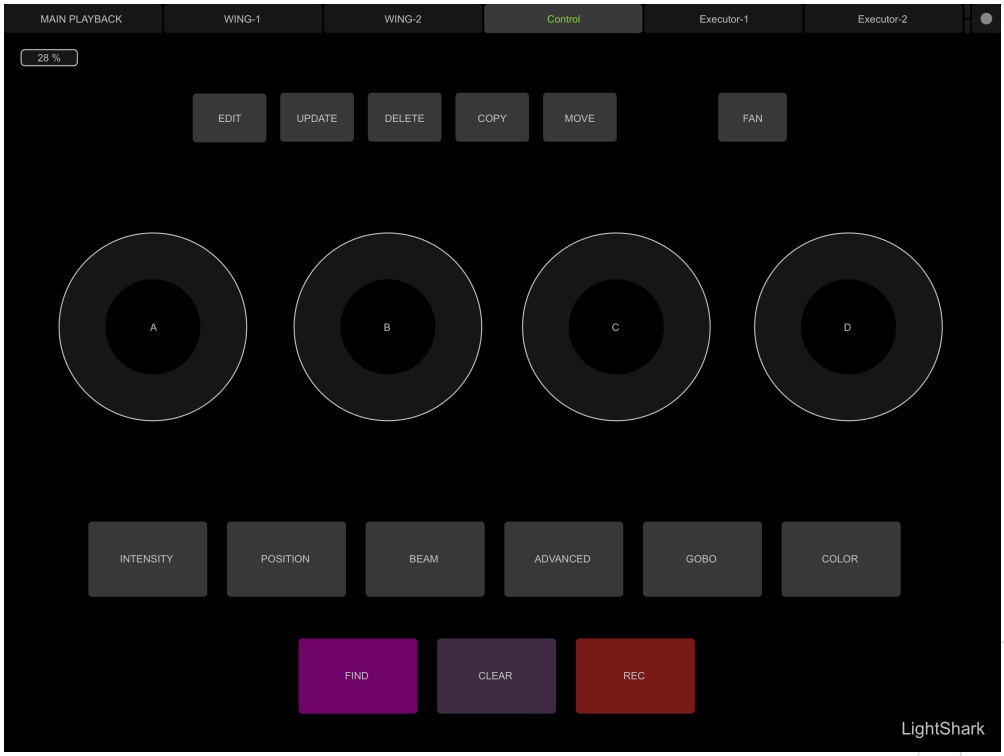
4 Go back and press "DONE".



5 In the lightShark Preferences, in the MIDI&OSC tab, make sure that OSC is enabled and that the input and output ports are correctly configured.



6 Now from TouchOSC you can control the lightShark.



Controlling lightShark from Vezér

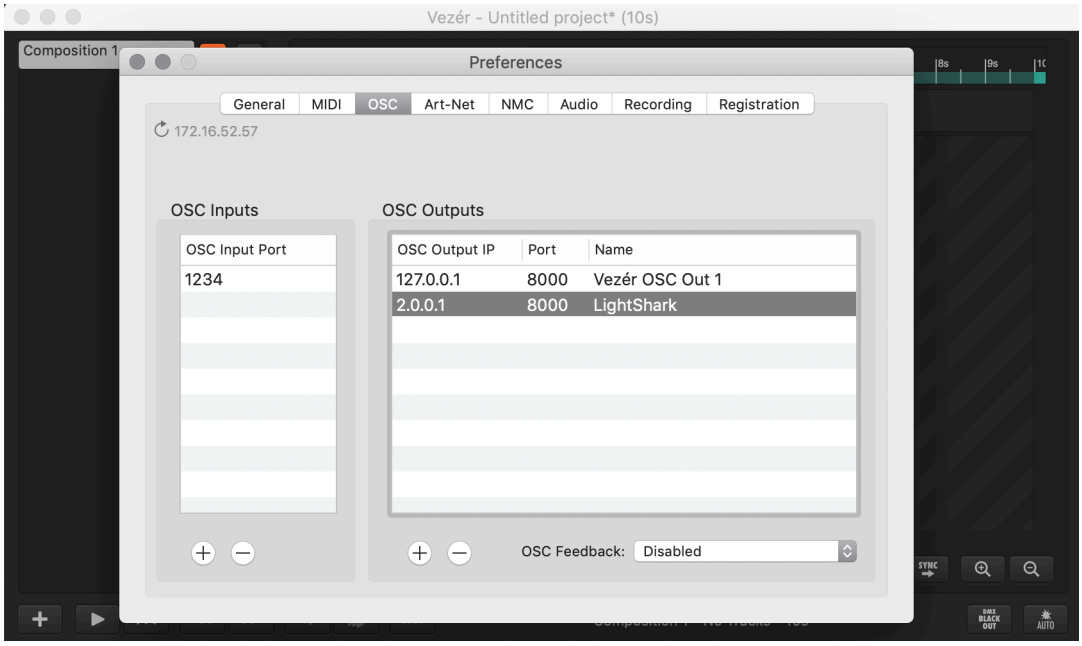
Vezér is a timeline-based MIDI/OSC/DMX sequencrr for audiovisual artists. Thanks to OSC tracks it allows to send different OSC commands to different devices simultaneously:

https://imimot.com/vezer/

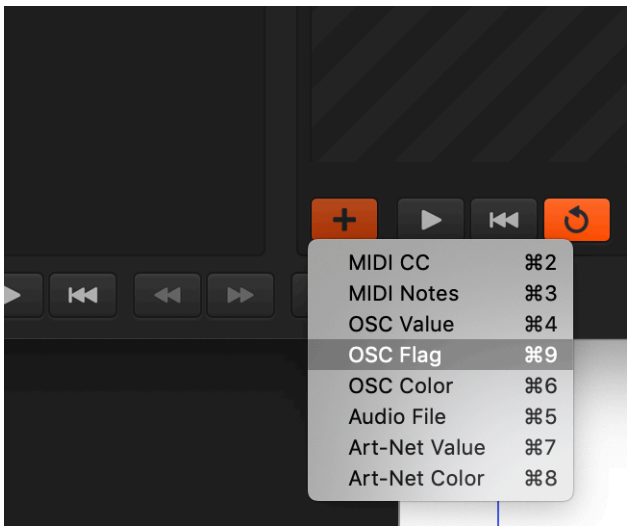
1 Connect the computer with Vezér to the same network as your LightShark device.

2 In lightShark within the preferences, in the MIDI&OSC tab make sure that OSC command reception is enabled and that the input and output ports are correctly configured.

3 In the Vezér preferences, add an OSC output by specifying the IP address and the LightShark input port,



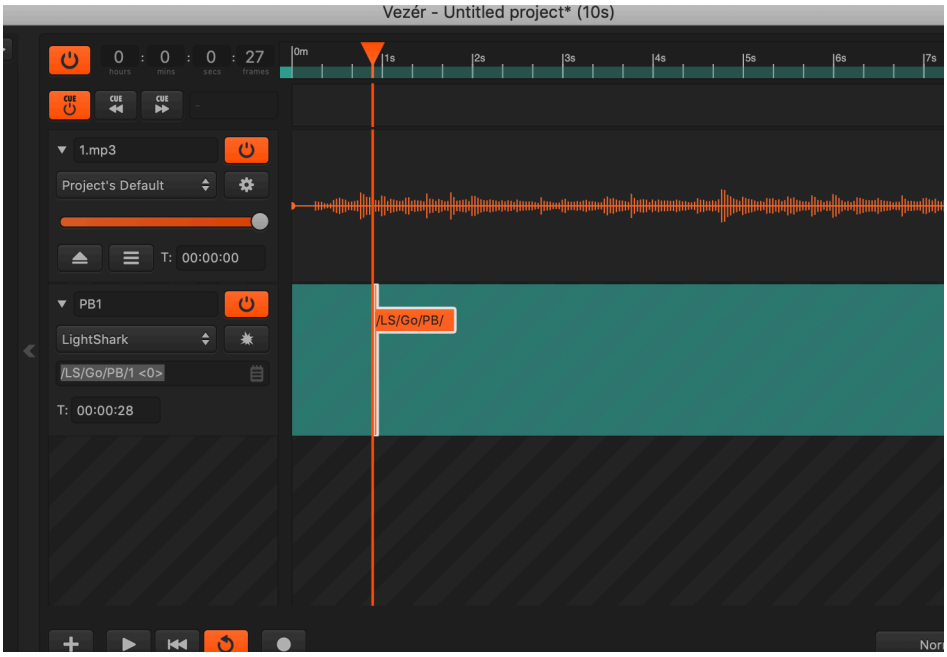
4 Add a “OSC Flag” track .



5 Add a Keyframe and enter the command with the action you want to perform.

Below is an example of how to send the "GO" command to Playback 1:

/LS/Go/PB/1 <0>



Note that actions in LightShark are performed by releasing the button, so the message is sent on <0> value instead of <1>.

Controlling lightShark from Millumin

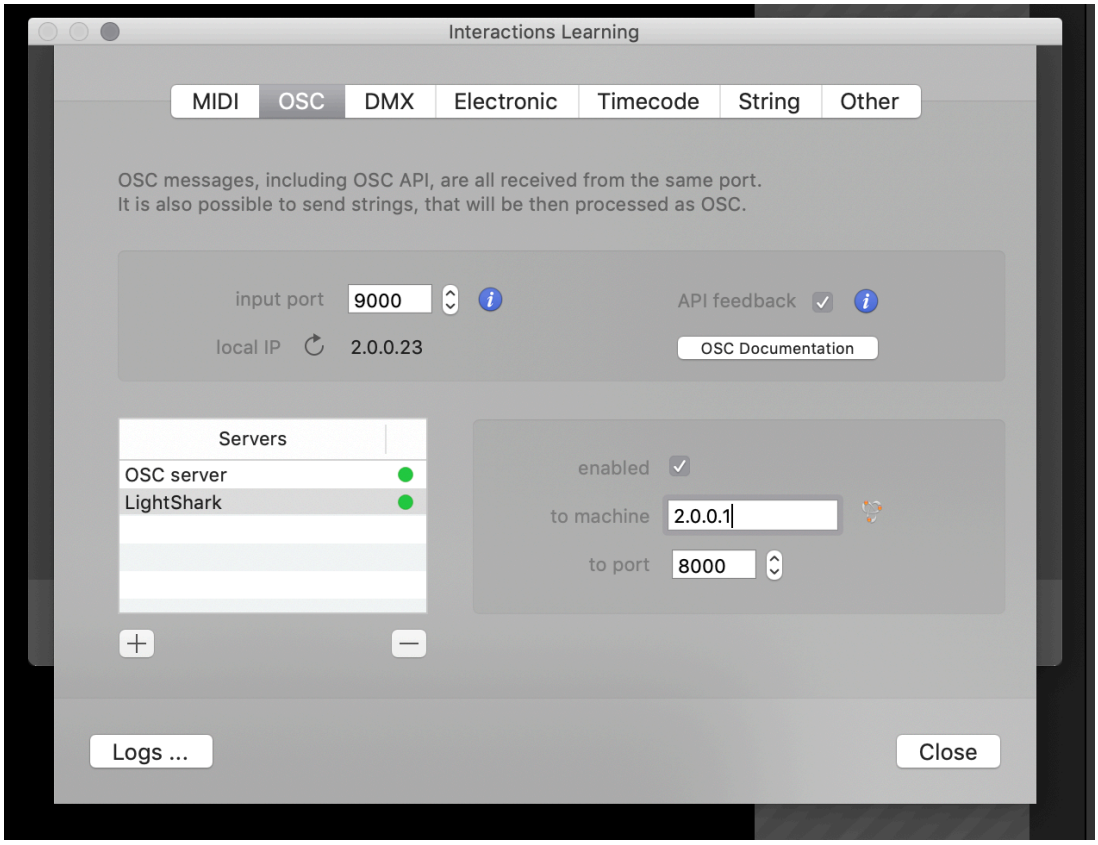
Millumin is a multimedia software for live event management:

https://www.millumin.com/v3/index.php#features

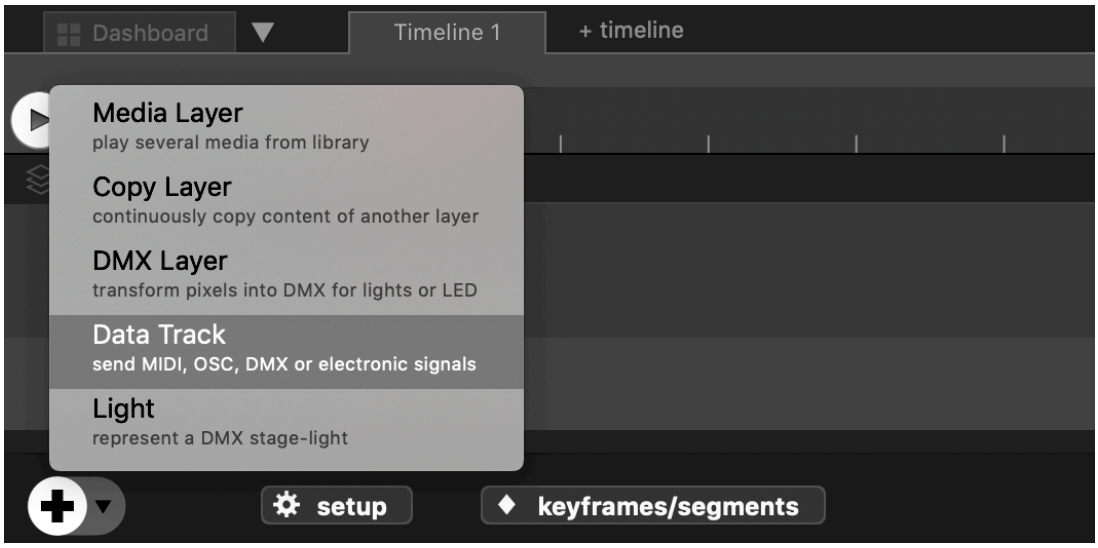
1 Connect the computer with Millumin to the same network as your LightShark device.

2 In lightShark within the preferences, in the MIDI&OSC tab make sure that OSC command reception is enabled and that the input and output ports are correctly configured.

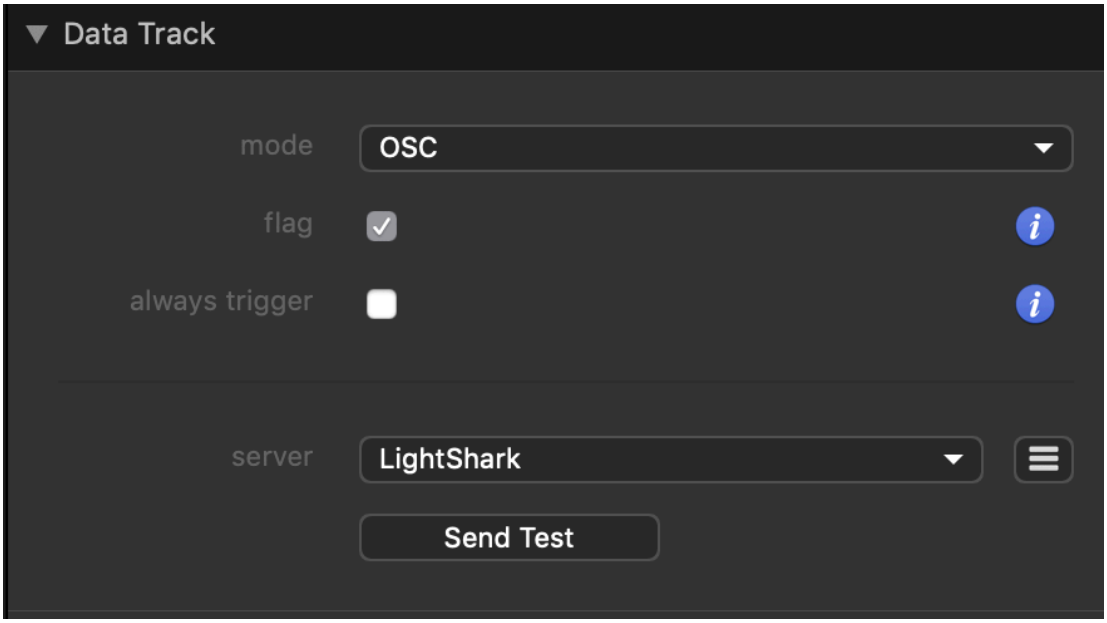
3 In the Millumin interactions window, add an OSC output by specifying the IP address and the LightShark input port,



4 Add a Data track.



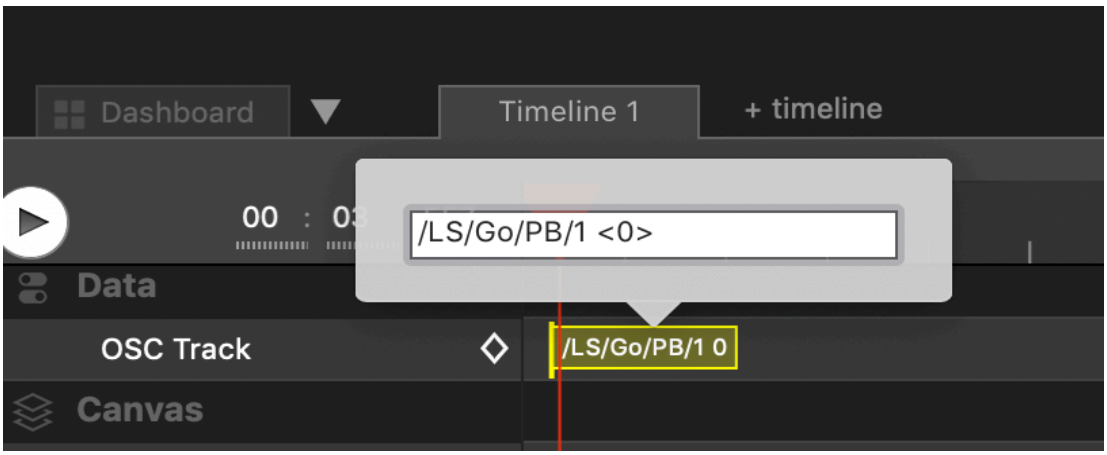
5 Set the track mode to OSC and check the "Flag" box.



6 Add a Keyframe and enter the command with the action you want to perform.

Below is an example of how to send the "GO" command to Playback 1:

/LS/Go/PB/1 <0>



Note that actions in LightShark are performed by releasing the button, so the message is sent on <0> value instead of <1>.

How to control lightShark from QLab

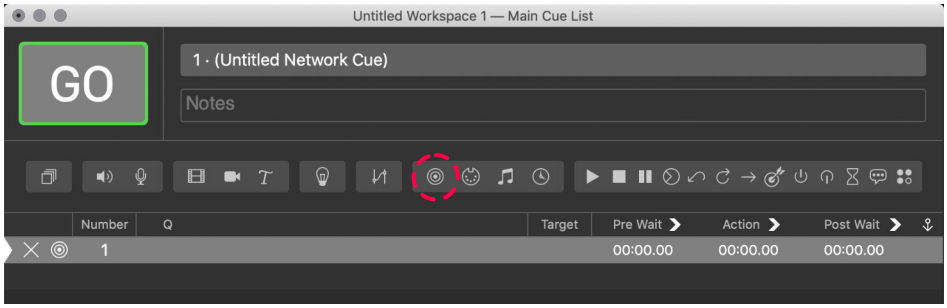
QLab is a multimedia live event management software:

https://figure53.com/qlab/

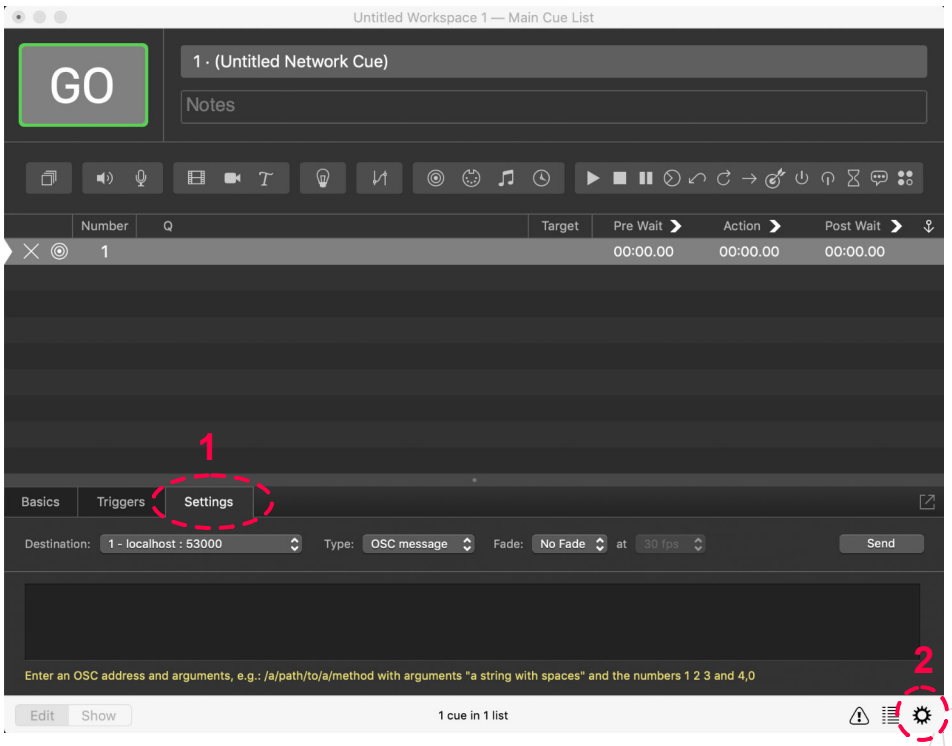
1 Connect your computer with QLab to the same network as your LightShark device.

2 In lightShark within the preferences, in the MIDI&OSC tab make sure that OSC command reception is enabled and that the input and output ports are correctly configured.

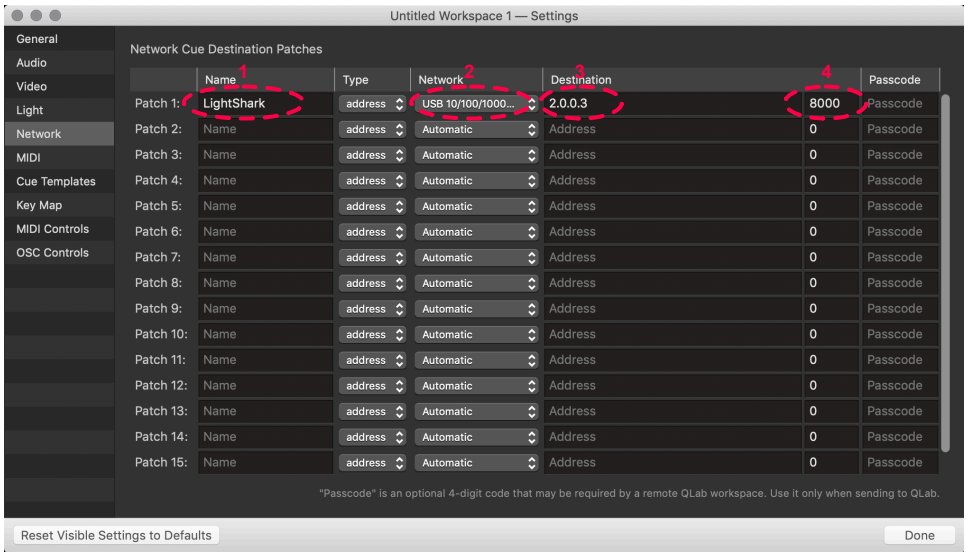
3 In the QLab main window, create a new "Network" type CUE.



4 Select the "Settings" tab and then go to the settings menu.



5 In the settings menu, select the "Network" tab and configure Patch1.



The configuration is carried out as follows:

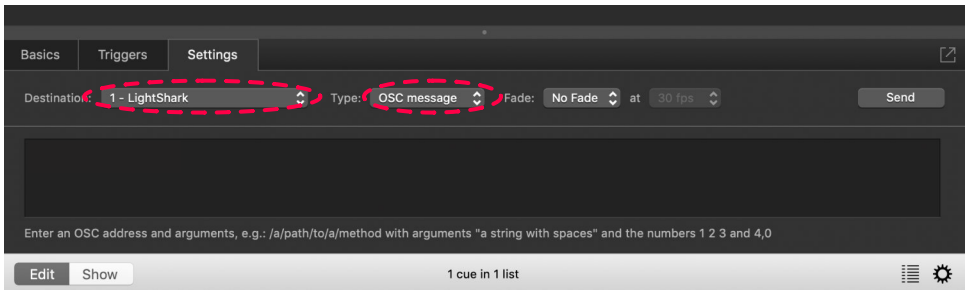
Enter a name to identify the Patch

Select the network interface to which your lightShark device is connected.

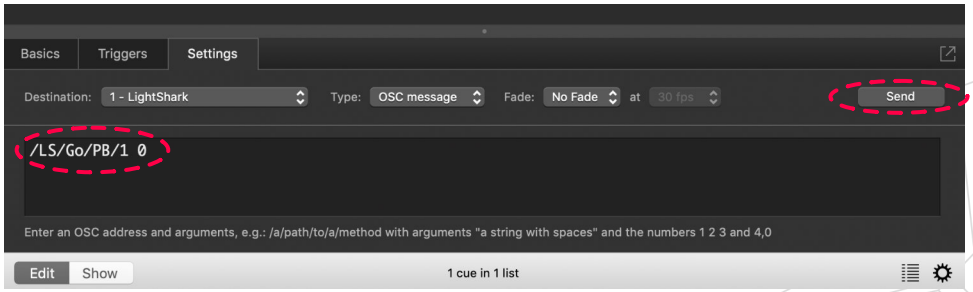
Enter the IP address of your LS-Core or LS-1.

Enter the OSC input port that you have configured in lightShark

6 In "Destination" select the Patch1 (lightShark) and in "Type" OSC message.



7 Enter the OSC command you wish to send and press "Send" to check that it is working correctly.



The following table contains the correspondence of OSC commands to Hexadecimal for use on UDP controllers that do not support OSC protocol.

Control	HEX
Page Up	2f4c532f506167652f5570002c66000000000000
Page Down	2f4c532f506167652f446f776e0000002c66000000000000
DBO	DBO push = 2f4c532f44424f002c6600003f800000. DBO release = 2f4c532f44424f002c66000000000000
Edit	2f4c532f45646974000000002c66000000000000
Update	2f4c532f55706461746500002c66000000000000
Delete	2f4c532f44656c65746500002c66000000000000
Copy	2f4c532f436f7079000000002c66000000000000
Move	2f4c532f4d6f7665000000002c66000000000000
Set	-
Fan	2f4c532f46616e002c66000000000000
Find	2f4c532f46696e64000000002c66000000000000
Clear	2f4c532f436c6561720000002c66000000000000
Rec	2f4c532f526563002c66000000000000
Playback Selection	PB1 = 2f4c532f53656c6563742f50422f31002c66000000000000 PB2 = 2f4c532f53656c6563742f50422f32002c66000000000000 PB30 = 2f4c532f53656c6563742f50422f3330000000002c66000000000000
Playback Go	PB1 = 2f4c532f476f2f50422f31002c66000000000000 PB2 = 2f4c532f476f2f50422f32002c66000000000000 PB30 = 2f4c532f476f2f50422f3330000000002c66000000000000
Playback Flash	PB1 push = 2f4c532f466c6173682f50422f3100002c6600003f800000 PB1 release = 2f4c532f466c6173682f50422f3100002c66000000000000 PB2 push = 2f4c532f466c6173682f50422f3200002c6600003f800000 PB2 release = 2f4c532f466c6173682f50422f3200002c66000000000000 PB30 push = 2f4c532f466c6173682f50422f3330002c6600003f800000 PB30 release = 2f4c532f466c6173682f50422f3330002c66000000000000
Playback Stop	PB1 = 2f4c532f53746f702f50422f310000002c66000000000000 PB2 = 2f4c532f53746f702f50422f320000002c66000000000000 PB30 = 2f4c532f53746f702f50422f333000002c66000000000000
Playback Prev	PB1 = 2f4c532f507265762f50422f310000002c66000000000000 PB2 = 2f4c532f507265762f50422f320000002c66000000000000 PB30 = 2f4c532f507265762f50422f333000002c66000000000000
Playback Next	PB1 = 2f4c532f4e6578742f50422f310000002c66000000000000 PB2 = 2f4c532f4e6578742f50422f320000002c66000000000000 PB30 = 2f4c532f4e6578742f50422f333000002c66000000000000
Playback Pause	PB1 = 2f4c532f50617573652f50422f3100002c66000000000000 PB2 = 2f4c532f50617573652f50422f3200002c66000000000000 PB30 = 2f4c532f50617573652f50422f3330002c66000000000000
Playback Fader Level	PB1 = 2f4c532f4c6576656c2f50422f3100002c660000430b563f PB2 = 2f4c532f4c6576656c2f50422f3200002c660000430d0723 PB30 = 2f4c532f4c6576656c2f50422f3330002c660000430d5db5
Main Playback Go	-
Main Playback Stop	-
Main Playback Prev	-
Main Playback Next	-
Main Playback Pause	-
Set GM Level	2f4c532f4c6576656c2f474d000000002c660000432fdcb3
Encoders	-

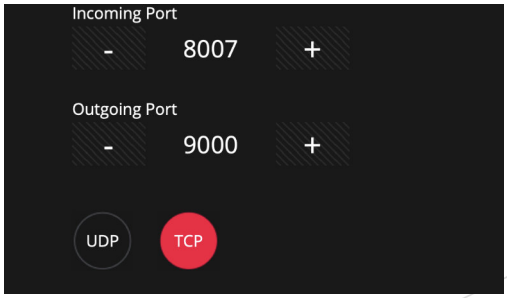
Control	HEX
Select Fixture	-
Select Group	-
Selection Next	-
Selection Prev	-
Intensity	-
Position	-
Colour	-
Beam	-
Advanced	-
Gobo	-
Fx	-
Executor Push Mode	Push = 2f4c532f4578656375746f722f312f372f3100002c6600003f800000 Release = 2f4c532f4578656375746f722f312f372f3100002c66000000000000
Executor Toggle Mode	2f4c532f4578656375746f722f312f312f3100002c66000000000000
Trigger Executor Row	Push = 2f4c532f4578656375746f724c696e652f3100002c6600003f800000 Release = 2f4c532f4578656375746f724c696e652f3100002c66000000000000
Sync All	2f4c532f53796e63000000002c66000000000000
Sync Only Playbacks	2f4c532f53796e632f506c61796261636b7300002c66000000000000
Sync Only Executors	2f4c532f53796e632f4578656375746f727300002c66000000000000
Release All	

How to control lightShark using TCP commands

LightShark can be controlled remotely via TCP commands. The commands are formed in the same way as OSC commands, but by adding an S in first place. Examples:

Control	Cmd	Element	Parameter	Example
Playback Selection	S/LS/Select/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To select the Playback number 9: S/LS/Select/PB/9
Playback Go	S/LS/Go/PB/[x]	[x]= Playback Number From=1 To=30	0 = Released 1 = Pressed	To press Go on Playback number 9: / S/LS/Go/PB/9

It is possible to select the protocol type from the MIDI/OSC preference window.



7.3 Network File Transmission

Lightshark has an active Samba server that allows us to create a File Server and Shared Resources. In this way we will be able to share files and directories from Linux computers to Windows computers, macOS and with GNU/Linux computers.

The shared files are:

The shows folder.

The folder of device libraries.

Connection from macOS

1 From the toolbar go to Go > Connect to Server...

2 Enter smb:// x.x.x.x ,where x.x.x.x is the IP address of lightShark.

3 Enter your username and password:

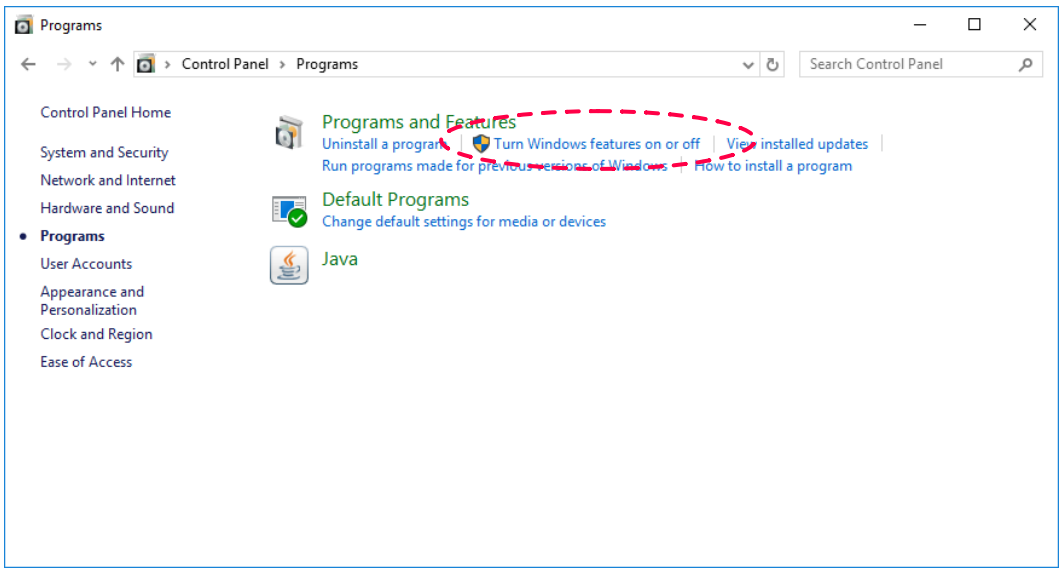
Usser: **equipson**
Password: **sharkjaws**

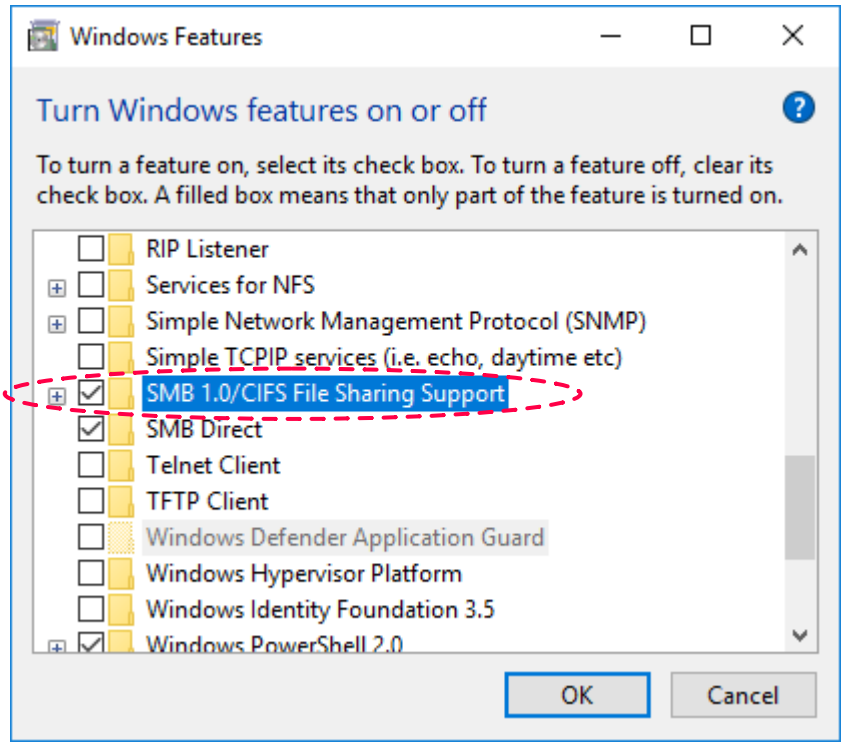
4 Select the share resource you want to access.

Connection from Windows 10

With the arrival of Windows 10 April 2018 Update Microsoft disabled by default the SMB/CIFS 1.0 protocol.

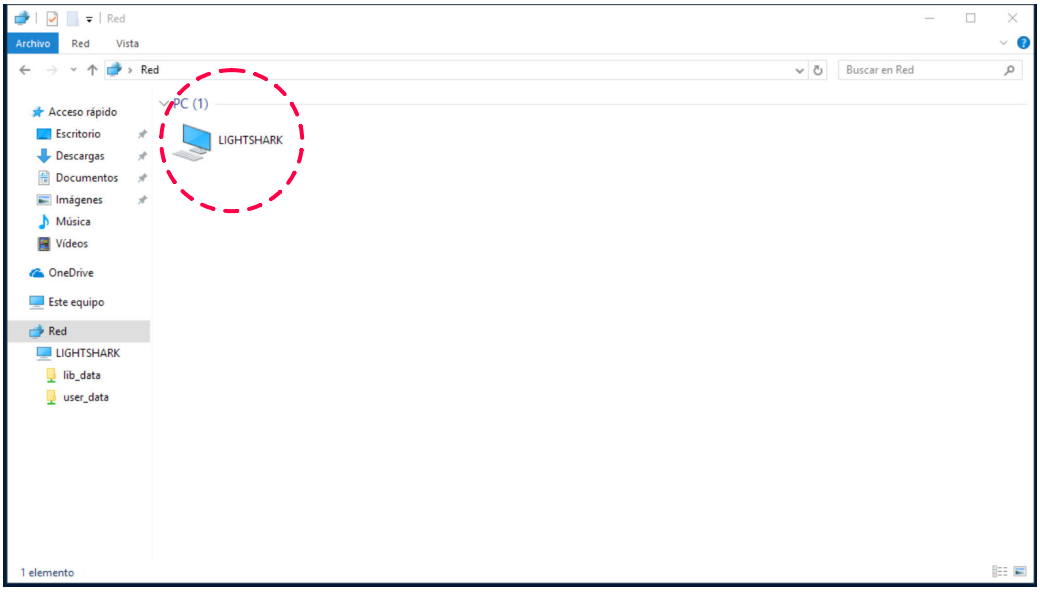
In order to install this protocol manually in the latest version of Windows 10, what we must do is open the Control Panel of the operating system (searching from Cortana "Control Panel" and, from it, we enter the "Programs" section. From here, click on "Turn Windows features on or off" to go to this section.



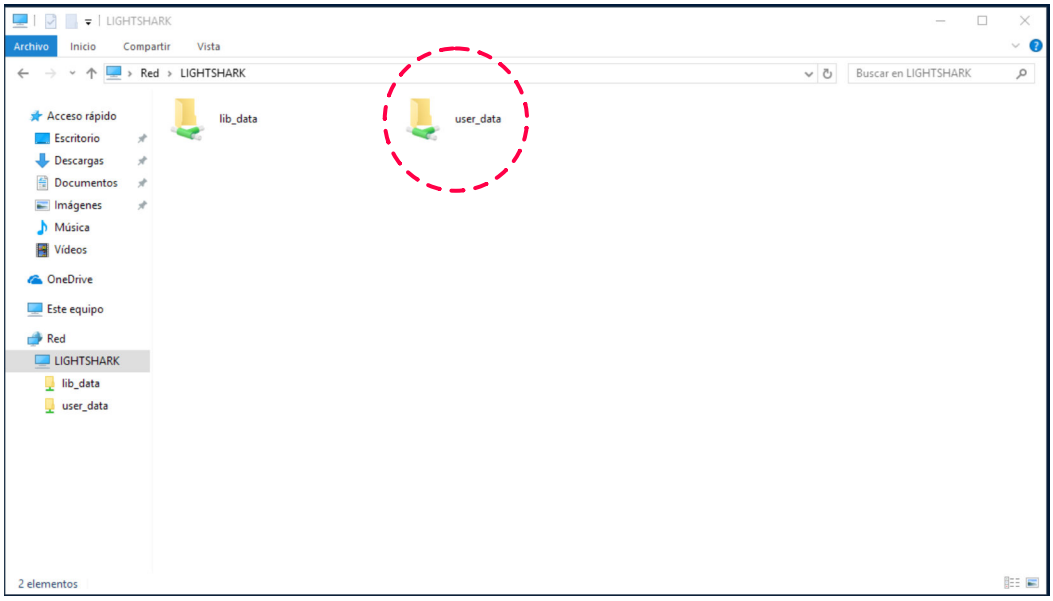


Once activated, we accept the changes and restart the computer. When it turns on again we will have SMB 1.0 working, and all the applications that depended on this protocol should work without problems equally in the last version of this operating system.

1 Access the network center and select access to lightShark.



2 Select the share resource you want to access.

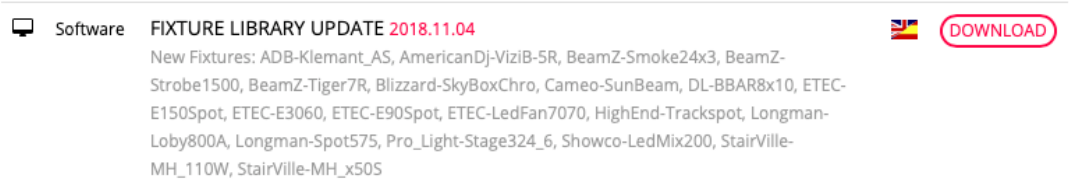


Section 8: Fixture Editor

8.1 Importing Fixture Packages

The lightShark development team regularly publishes fixture packages including new profiles. Fixture packages can be downloaded from the lightShark website:

https://www.workpro.es/lightshark

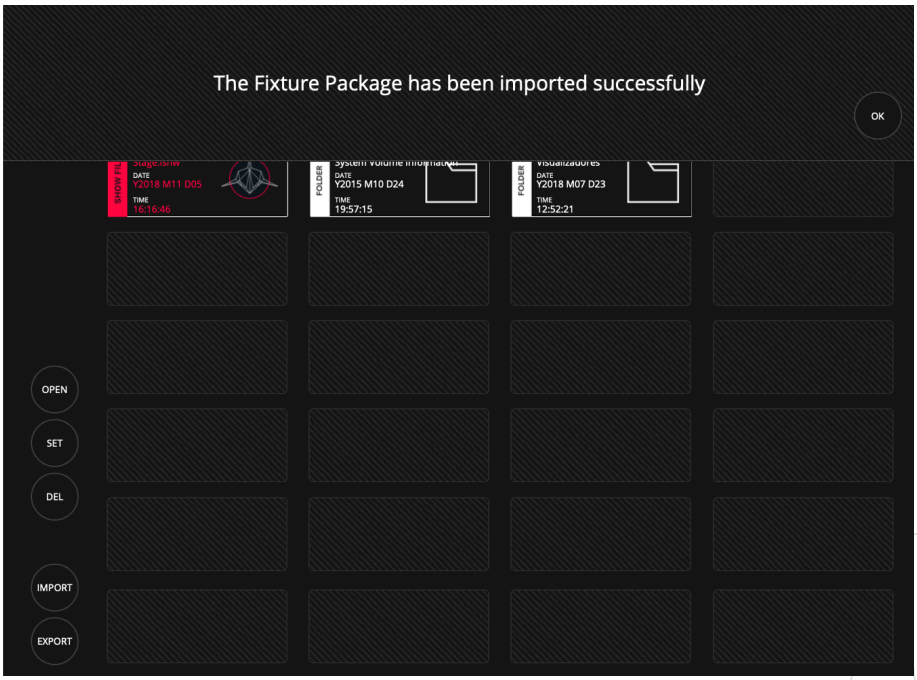


1 After downloading the latest fixture package, copy it to a USB memory stick and connect it to the USB Host port (on the LS_Core) or USB Data port (on the LS-1).

2 Connect to lightShark, open the File Manager and select the "USB" tab.

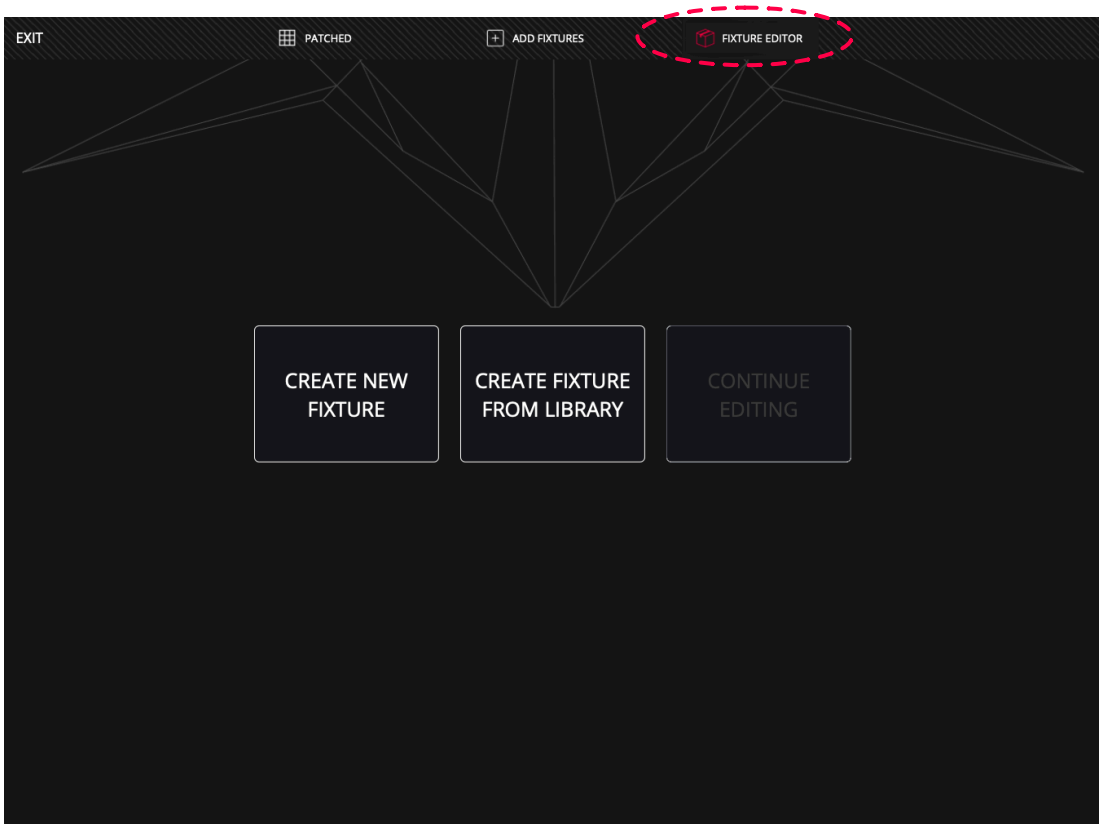
3 Click "IMPORT" and select the fixture package file.

4 Wait for the copy to finish



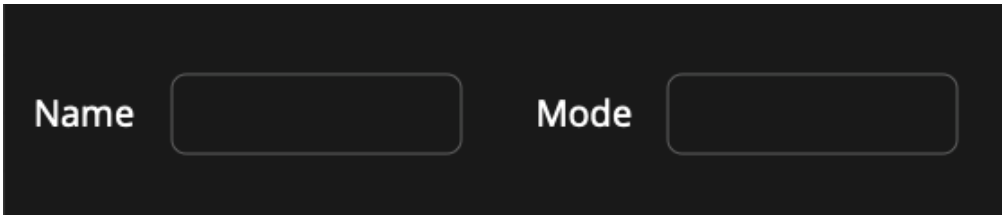
8.2 Create a new Fixture

LightShark has an integrated fixture editor, with which the user can create their own profiles for new fixtures. You can access the editor from the Patch > Fixture Editor window.



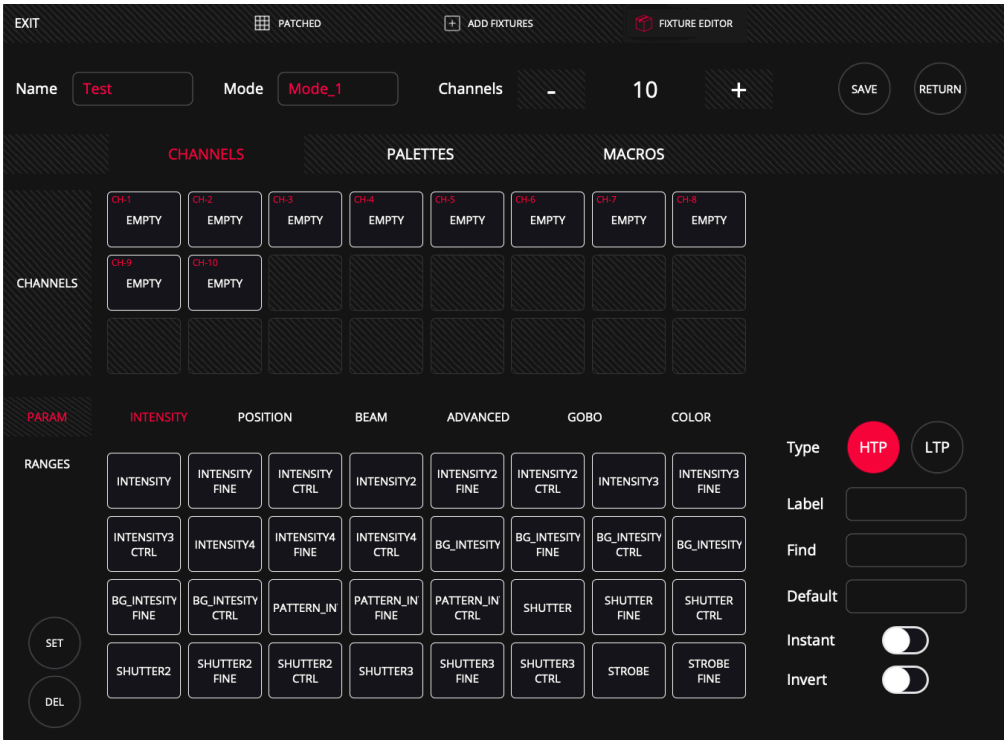
1 Selecting the "CREATE NEW FIXTURE" option will display the editor window.

2 Enter the fixture name and mode. Press and hold the text fields for two seconds. They should not have more than 10 characters and should not use white spaces.

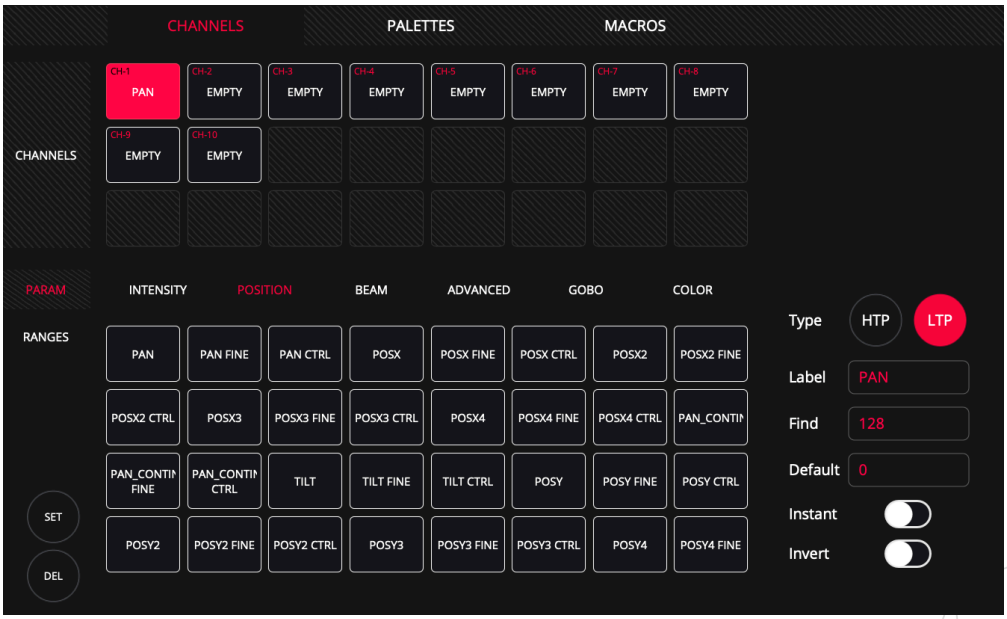


3 Enter the amount of channels the fixture has.

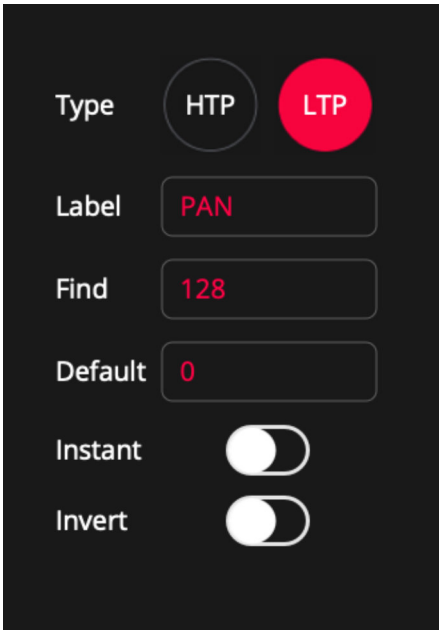
4 After entering the number of channels, lightShark will create as many boxes as channels. .



5 Select one of the empty boxes and then select one of the parameters at the bottom. These are divided into 6 different types (Section 3.6 has already explained each of the types and their parameters).



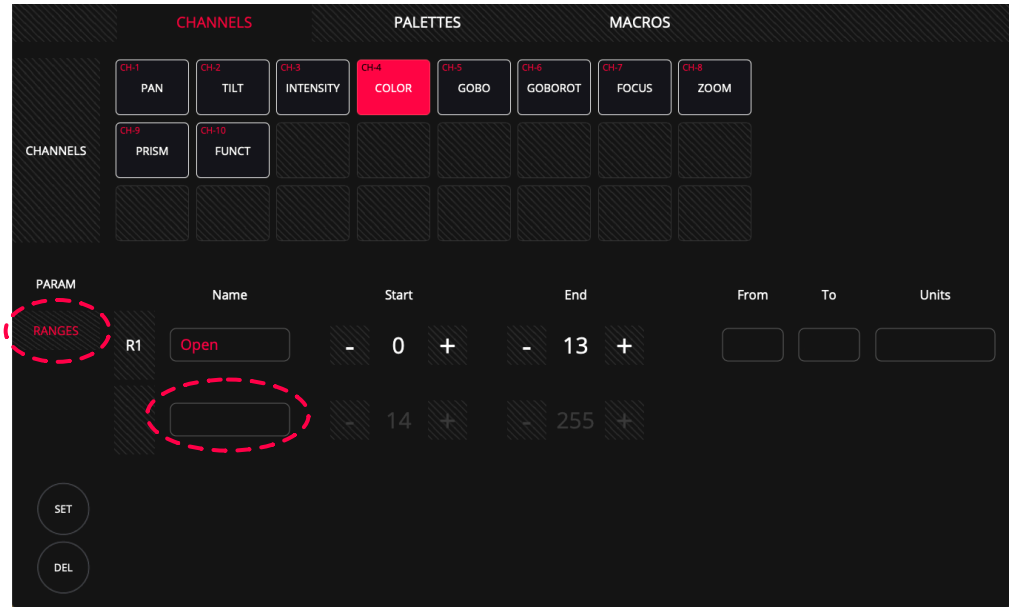
Selecting a lightShark parameter will autocomplete the Channel Type (HTP or LTP), Label, Find value and Default value. It is possible to configure the channel as "INVERT" or "INSTANT".



Enabling the "INSTANT" option will ignore the fade and transition times. Enabling the "INVERT" option will cause lightShark to invert the output values for that channel.

You can scroll between the different parameters.

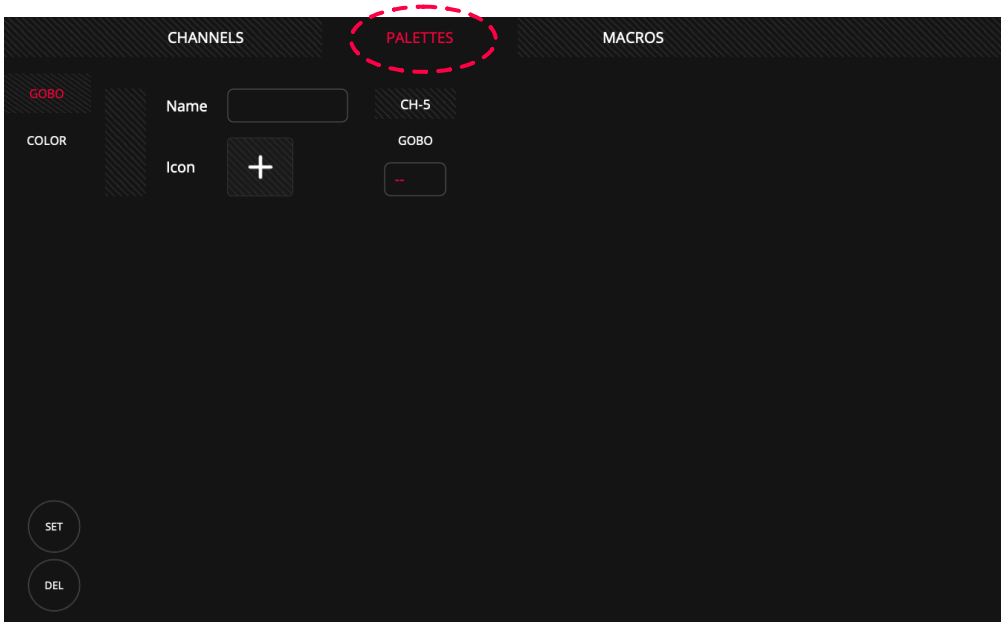
6 Once the parameters have been assigned to all the channels, the ranges for each channel must be defined.



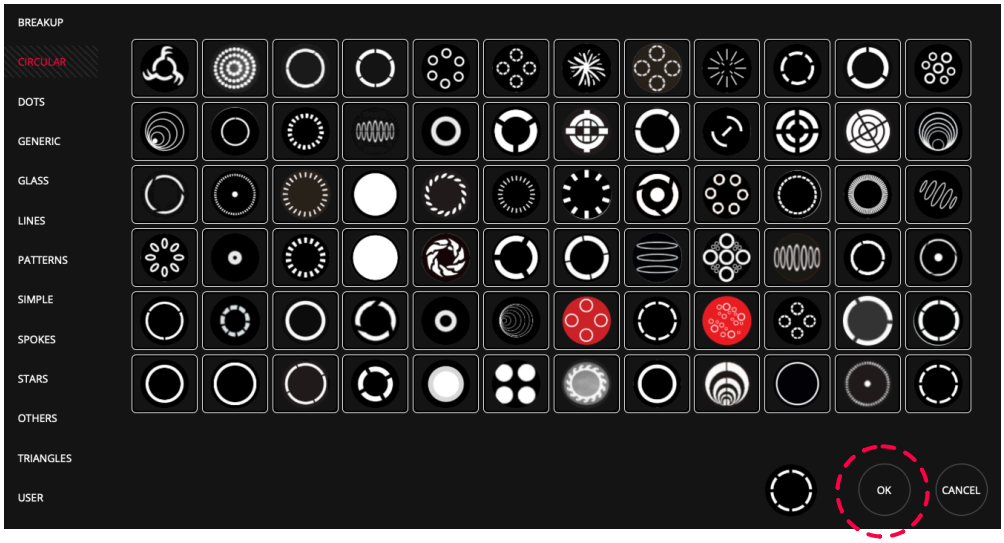
Hold down the "Name" field for two seconds to add a new segment, through the spinners set the minimum and maximum value of that range.

Repeat the process as many times as necessary to create the necessary ranges.

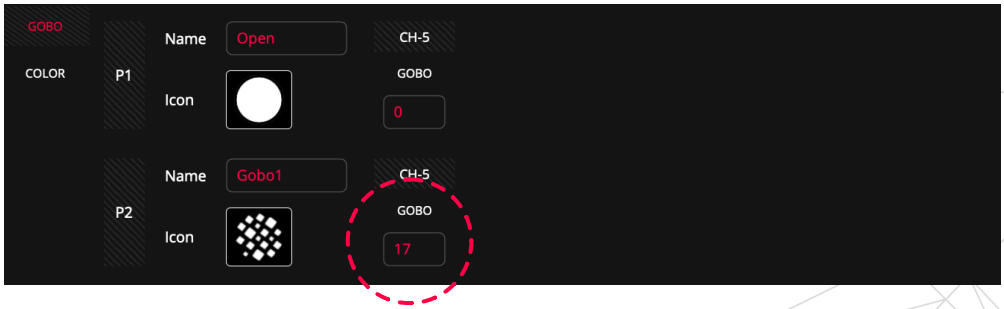
7 You can define the color and Gobo palettes of the fixture, can access the palette window from the "PALLETES" tab.



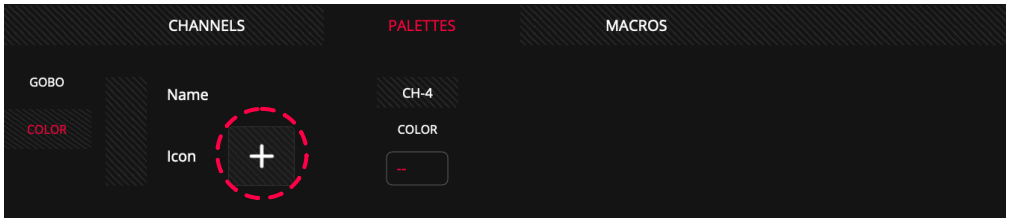
To add a gobo palette, enter a name to the palette and then add an icon. These are sorted by type.

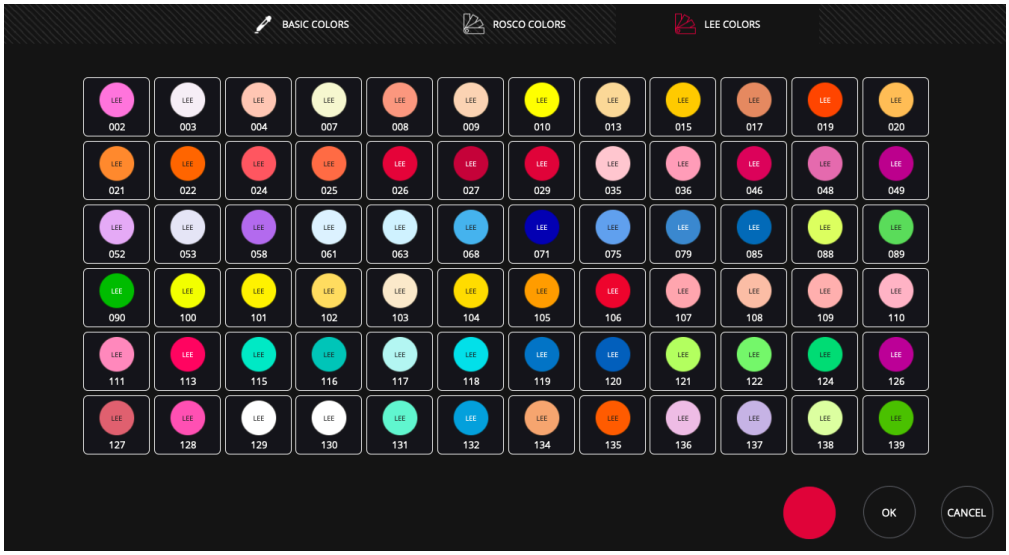


Once the gobo has been selected, press "OK" and set the channel value for that particular palette.

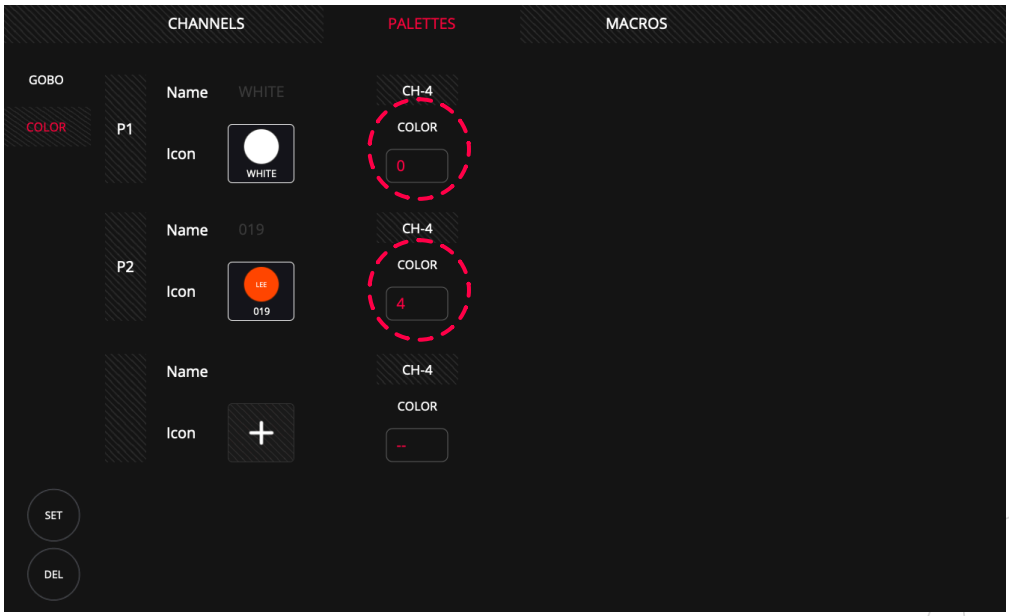


8 LightShark includes the Rosco and Lee color libraries, to create a color palette you must first select a color from the library.

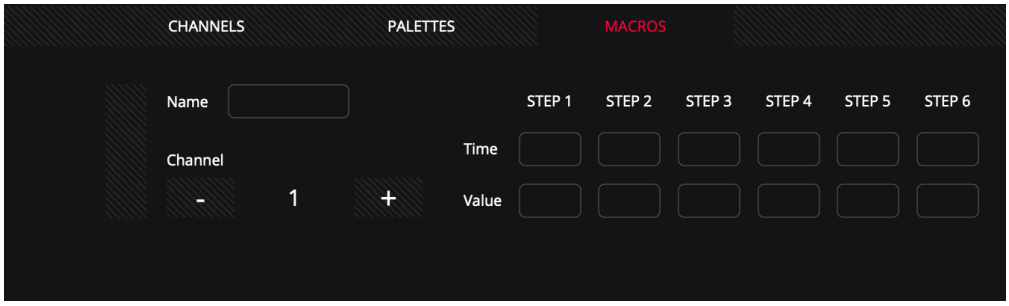




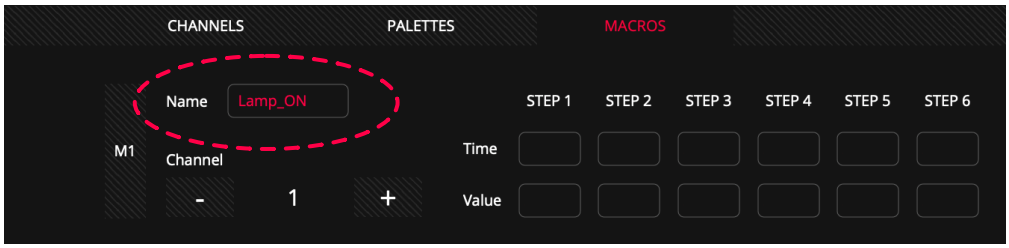
Once the color has been selected, you must enter the value of the channel for that color.



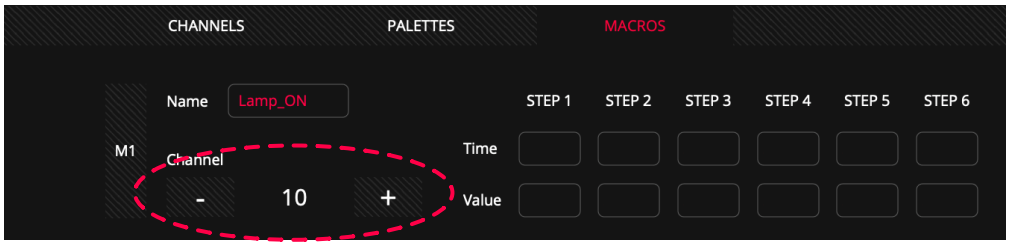
9 From the "MACROS" tab the user can define the functions of "LAMP ON", "LAMP OFF". "RESET", etc.



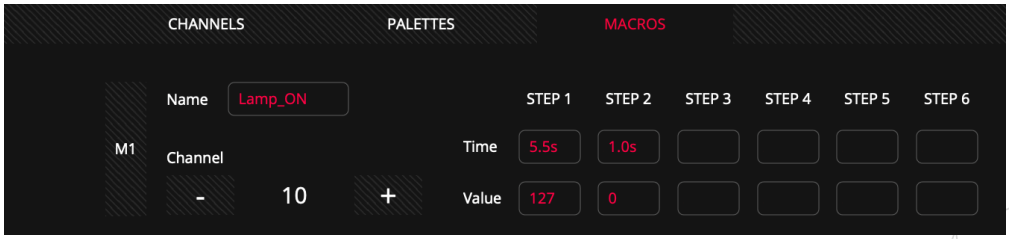
Press and hold the name field for two seconds to add a label to the Macro.



10 Select the channel that controls the Lamp_On, Lamp_Off , Reset...

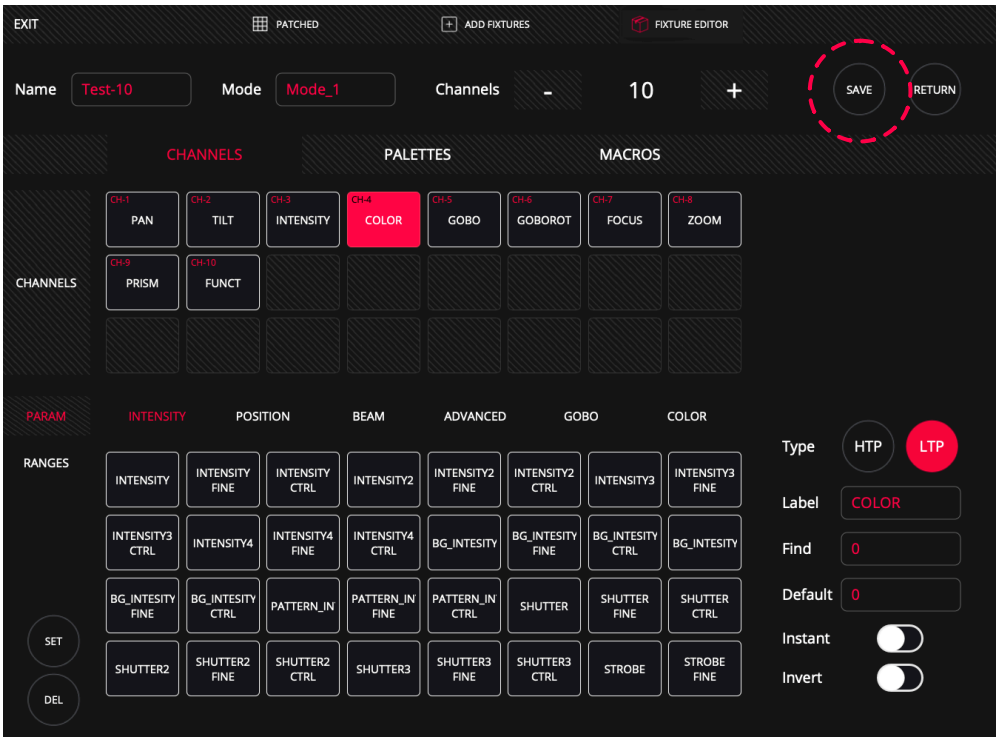


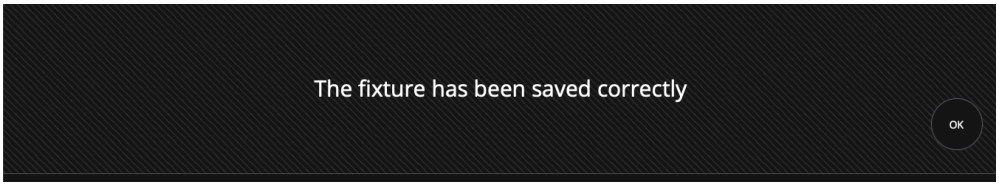
11 Define the values that the channel must have along the time period for the macro to be executed correctly.



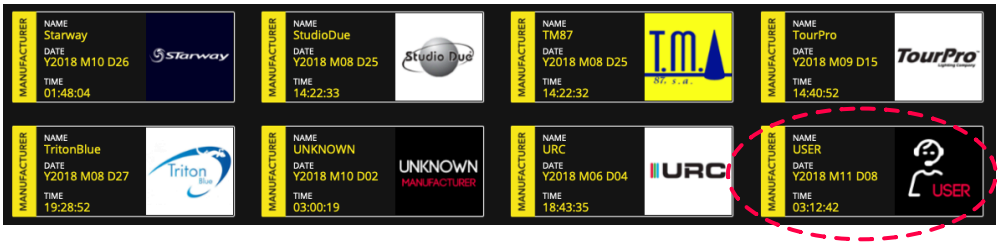
In this example the macro will send a value of 127 to the device for 5.5 seconds and then reset the channel to 0.

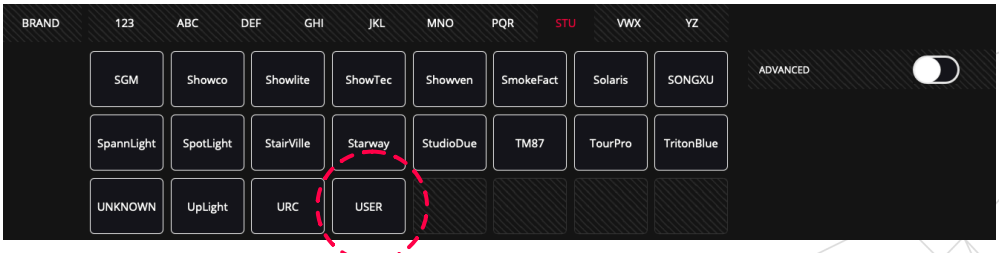
12 Save the changes so that lightShark adds the new device to the internal library.





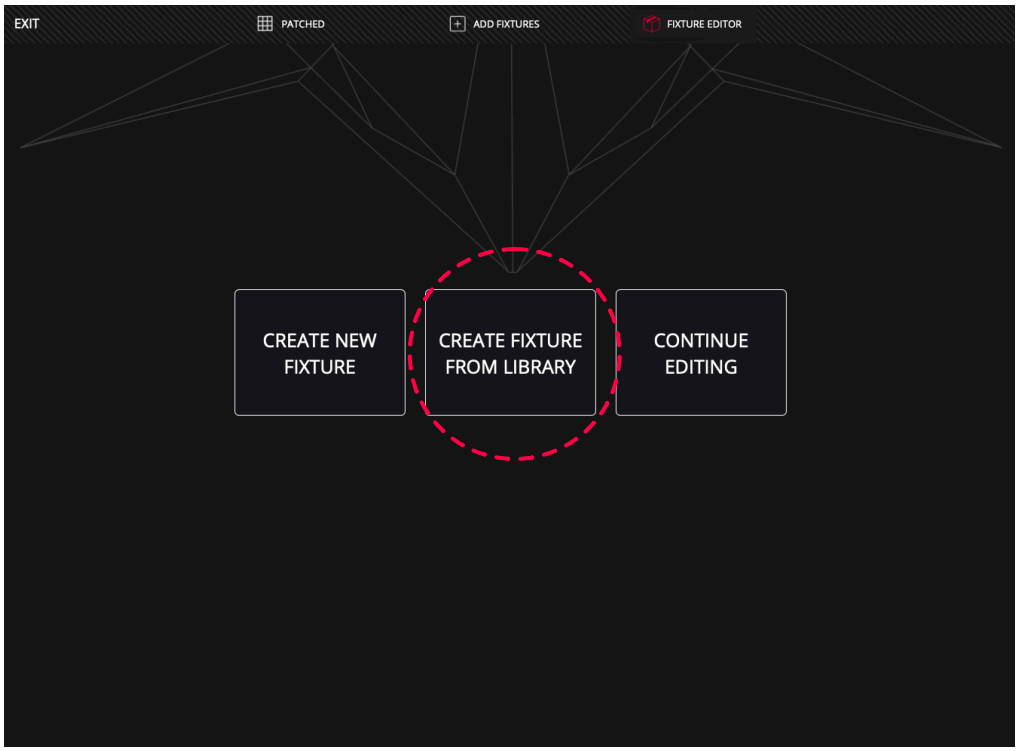
The fixtures created by the user are added to the internal library within the manufacturer "USER".



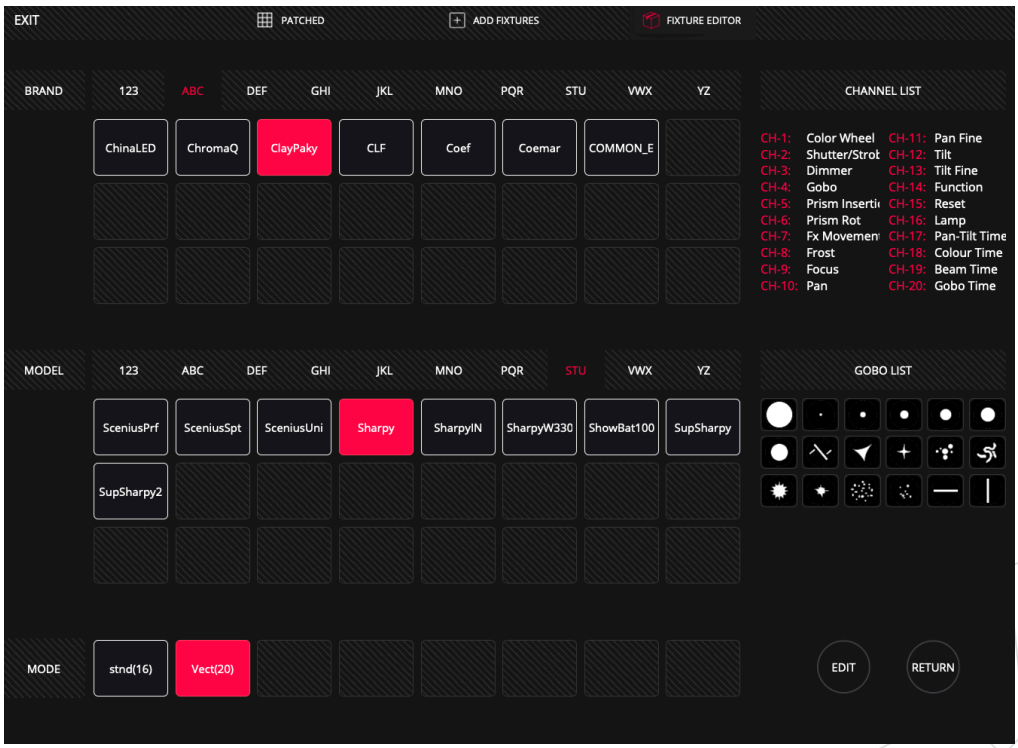


8.3 Editing a Fixture

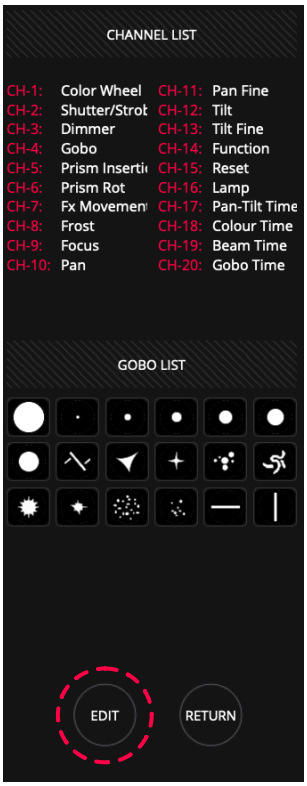
It is possible to edit a fixture within the library to create a new one, this is very useful especially when the fixture we have looks a lot like another fixture from a different manufacturer.



1 Select the option "CREATE FIXTURE FROM LIBRARY" and then select the fixture you want to use as the basis for creating the new fixture. .

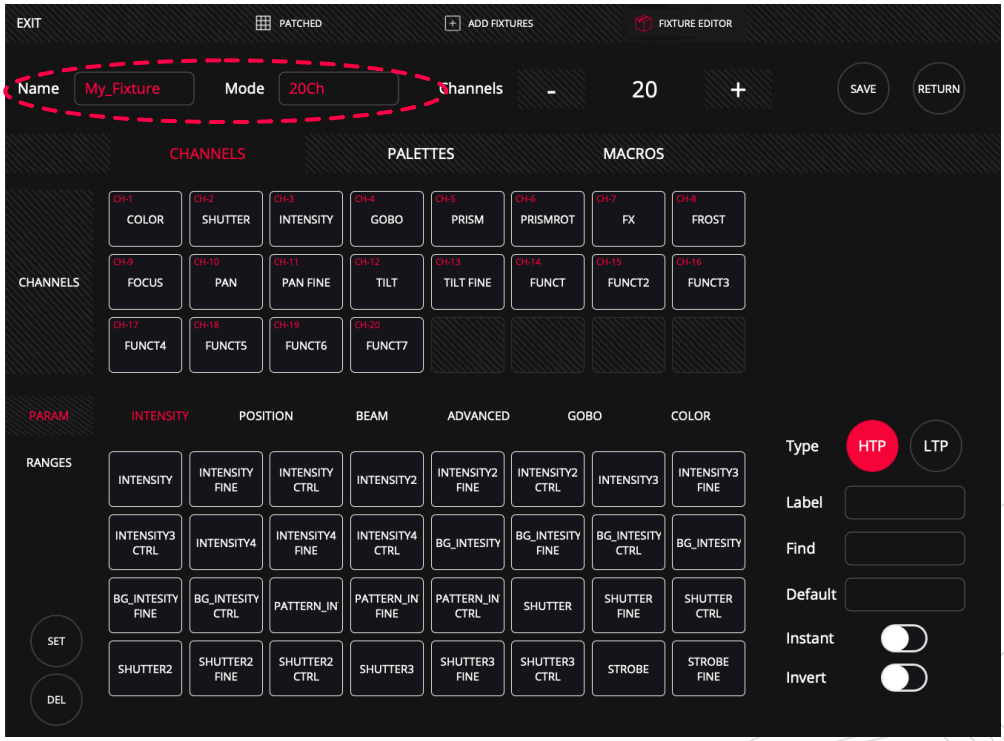


On the right side you can find the basic information of the fixture indicating the number of channels and their function. This allows you to check and see if the fixture meets your needs.



2 By pressing "EDIT" lightShark will load this fixture into the library editor, where you can make the relevant changes.

Once you have finished editing the fixture, press "SAVE" to add the new fixture to the "USER" folder.

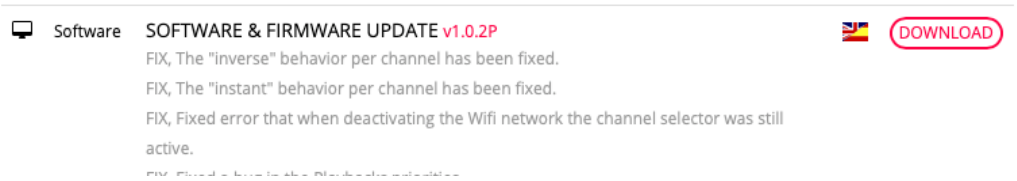


Section 9: Hardware & Software

9.1 Software Update

The lightShark development team regularly publishes software update packages including new features and bug fixes. The update packages can be downloaded from the lightShark website:

https://www.workpro.es/lightshark

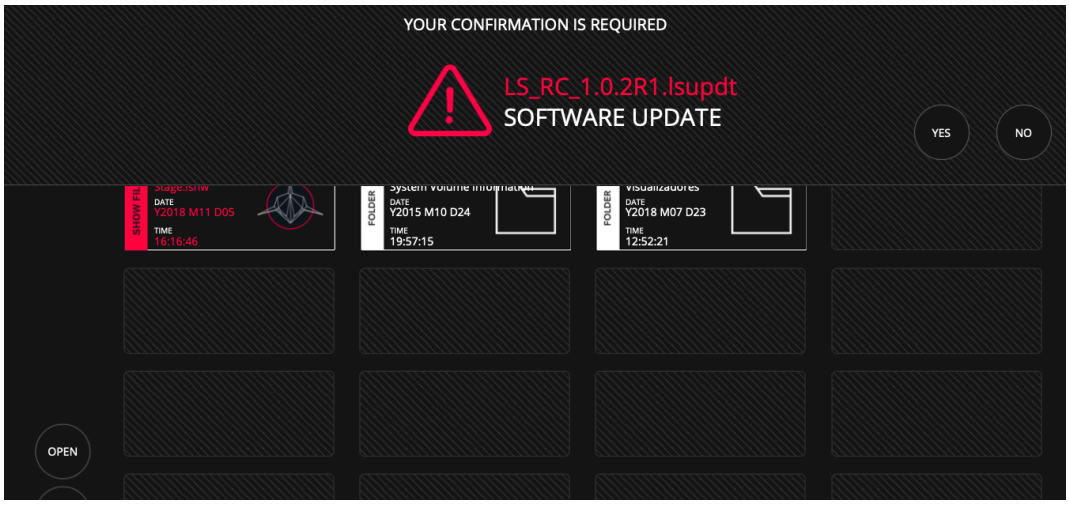


1 After downloading the latest update package, copy it to a USB stick and connect it to the USB Host port (on the LS_Core) or USB Data port (on the LS-1).

2 Connect to lightShark, open the File Manager and select the "USB" tab.

3 Click "OPEN" and select the update file.

4 Wait for the update to finish. The process usually takes about 3 minutes and if the update includes a new firmware, 2 restarts are necessary.



9.2 Reset

LightShark includes a series of key shortcuts for reset or shutdown functions.

Software Reset to LS-1.

1 Turn off the console

2 Press the keys NEXT+PREV+1

3 With the keys pressed, switch on the console and wait 4 seconds.

4 After 4 seconds, release the keys. LightShark will restart and at the next boot the console will load software version 1.0.

Software restart in LS-Core.

1 Turn off the device

2 Press the keys SET+NEXT+RESET

3 With the keys pressed, switch on the device and wait 4 seconds.

4 After 4 seconds, release the keys. LightShark will restart and at the next boot the console will load software version 1.0.

Reset Network settings in LS-1.

1 Turn off the console

2 Press the keys NEXT+PREV+2

3 With the keys pressed, switch on the console and wait 4 seconds.

4 After 4 seconds, release the keys. LightShark will restart and at the next start the network settings will be reset to factory settings.

Reset Network settings in LS-Core.

1 Turn off the device

2 Press the keys NEXT+RESET

3 With the keys pressed, switch on the device and wait 4 seconds.

4 After 4 seconds, release the keys. LightShark will restart and at the next start the network settings will be reset to factory settings.

Show firmware version in LS-1.

1 Turn off the console

2 Press the keys NEXT+PREV+DBO

3 With the keys pressed, switch on the console and wait 4 seconds.

4 After 4 seconds, release the keys. The LCD will display the firmware version.

Hardware Test in LS-1.

1 Turn off the console

2 Press the keys NEXT+PREV+10

3 With the keys pressed, switch on the console and wait 4 seconds.

4 After 4 seconds, release the keys. LightShark will show on the LCD a small utility to check the Hardware.

Turning off LS-1 by keystroke.

It is possible to turn off the LS-1 console from the control surface by holding down the DBO+CLEAR keys for 3 seconds.

Section 10: Licenses

10.1 Software Licenses

Python License (Python-2.0)

Python License, Version 2 (Python-2.0) PYTHON SOFTWARE FOUNDATION LICENSE VERSION 2 ----------

1. This LICENSE AGREEMENT is between the Python Software Foundation ("PSF"), and the Individual or Organization ("Licensee") accessing and otherwise using this software ("Python") in source or binary form and its associated documentation.

2. Subject to the terms and conditions of this License Agreement, PSF hereby grants Licensee a nonexclusive, royalty-free, world-wide license to reproduce, analyze, test, perform and/or display publicly, prepare derivative works, distribute, and otherwise use Python alone or in any derivative version, provided, however, that PSF's License Agreement and PSF's notice of copyright, i.e., "Copyright (c) 2001, 2002, 2003, 2004, 2005, 2006 Python Software Foundation; All Rights Reserved" are retained in Python alone or in any derivative version prepared by Licensee.

3. In the event Licensee prepares a derivative work that is based on or incorporates Python or any part thereof, and wants to make the derivative work available to others as provided herein, then Licensee hereby agrees to include in any such work a brief summary of the changes made to Python.

4. PSF is making Python available to Licensee on an "AS IS" basis. PSF MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED. BY WAY OF EXAMPLE, BUT NOT LIMITATION, PSF MAKES NO AND DISCLAIMS ANY REPRESENTATION OR WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR THAT THE USE OF PYTHON WILL NOT INFRINGE ANY THIRD PARTY RIGHTS.

5. PSF SHALL NOT BE LIABLE TO LICENSEE OR ANY OTHER USERS OF PYTHON FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES OR LOSS AS A RESULT OF MODIFYING, DISTRIBUTING, OR OTHERWISE USING PYTHON, OR ANY DERIVATIVE THEREOF, EVEN IF ADVISED OF THE POSSIBILITY THEREOF.

6. This License Agreement will automatically terminate upon a material breach of its terms and conditions.

7. Nothing in this License Agreement shall be deemed to create any relationship of agency, partnership, or joint venture between PSF and Licensee. This License Agreement does not grant permission to use PSF trademarks or trade name in a trademark sense to endorse or promote products or services of Licensee, or any third party.

8. By copying, installing or otherwise using Python, Licensee agrees to be bound by the terms and conditions of this License Agreement

BEOPEN.COM LICENSE AGREEMENT FOR PYTHON 2.0 ---------- - BEOPEN PYTHON OPEN SOURCE LICENSE AGREEMENT VERSION 1

1. This LICENSE AGREEMENT is between BeOpen.com ("BeOpen"), having an office at 160 Saratoga Avenue, Santa Clara, CA 95051, and the Individual or Organization ("Licensee") accessing and otherwise using this software in source or binary form and its associated documentation ("the Software").

2. Subject to the terms and conditions of this BeOpen Python License Agreement, BeOpen hereby grants Licensee a non-exclusive, royalty-free, world-wide license to reproduce, analyze, test, perform and/or display publicly, prepare derivative works, distribute, and otherwise use the Software alone or in any derivative version, provided, however, that the BeOpen Python License is retained in the Software, alone or in any derivative version prepared by Licensee.

3. BeOpen is making the Software available to Licensee on an "AS IS" basis. BEOPEN MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED. BY WAY OF EXAMPLE, BUT NOT LIMITATION, BEOPEN MAKES NO AND DISCLAIMS ANY REPRESENTATION OR WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR THAT THE USE OF THE SOFTWARE WILL NOT INFRINGE ANY THIRD PARTY RIGHTS.

4. BEOPEN SHALL NOT BE LIABLE TO LICENSEE OR ANY OTHER USERS OF THE SOFTWARE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES OR LOSS AS A RESULT OF USING, MODIFYING OR DISTRIBUTING THE SOFTWARE, OR ANY DERIVATIVE THEREOF, EVEN IF ADVISED OF THE POSSIBILITY THEREOF.

5. This License Agreement will automatically terminate upon a material breach of its terms and conditions.

6. This License Agreement shall be governed by and interpreted in all respects by the law of the State of California, excluding conflict of law provisions. Nothing in this License Agreement shall be deemed to create any relationship of agency, partnership, or joint venture between BeOpen and Licensee. This License Agreement does not grant permission to use BeOpen trademarks or trade names in a trademark sense to endorse or promote products or services of Licensee, or any third party. As an exception, the "BeOpen Python" logos available at http://www.pythonlabs.com/logos.html may be used according to the permissions granted on that web page.

7. By copying, installing or otherwise using the software, Licensee agrees to be bound by the terms and conditions of this License Agreement.

CNRI OPEN SOURCE LICENSE AGREEMENT (for Python 1.6b1) ---------- ---------- IMPORTANT: PLEASE READ THE FOLLOWING AGREEMENT CAREFULLY. BY CLICKING ON "ACCEPT" WHERE INDICATED BELOW, OR BY COPYING, INSTALLING OR OTHERWISE USING PYTHON 1.6, beta 1 SOFTWARE, YOU ARE DEEMED TO HAVE AGREED TO THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT.

1. This LICENSE AGREEMENT is between the Corporation for National Research Initiatives, having an office at 1895 Preston White Drive, Reston, VA 20191 ("CNRI"), and the Individual or Organization ("Licensee") accessing and otherwise using Python 1.6, beta 1 software in source or binary form and its associated documentation, as released at the www.python.org Internet site on August 4, 2000 ("Python 1.6b1").

2. Subject to the terms and conditions of this License Agreement, CNRI hereby grants Licensee a non-exclusive, royalty-free, world-wide license to reproduce, analyze, test, perform and/or display publicly, prepare derivative works, distribute, and otherwise use Python 1.6b1 alone or in any derivative version, provided, however, that CNRIs License Agreement is retained in Python 1.6b1, alone or in any derivative version prepared by Licensee. Alternately, in lieu of CNRIs License Agreement, Licensee may substitute the following text (omitting the quotes): "Python 1.6, beta 1, is made available subject to the terms and conditions in CNRIs License Agreement. This Agreement may be located on the Internet using the following unique, persistent identifier (known as a handle): 1895.22/1011. This Agreement may also be obtained from a proxy server on the Internet using the URL:http://hdl.handle.net/1895.22/1011".

3. In the event Licensee prepares a derivative work that is based on or incorporates Python 1.6b1 or any part thereof, and wants to make the derivative work available to the public as provided herein, then Licensee hereby agrees to indicate in any such work the nature of the modifications made to Python 1.6b1.

4. CNRI is making Python 1.6b1 available to Licensee on an "AS IS" basis. CNRI MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED. BY WAY OF EXAMPLE, BUT NOT LIMITATION, CNRI MAKES NO AND DISCLAIMS ANY REPRESENTATION OR WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OR THAT THE USE OF PYTHON 1.6b1 WILL NOT INFRINGE ANY THIRD PARTY RIGHTS.

5. CNRI SHALL NOT BE LIABLE TO LICENSEE OR ANY OTHER USERS OF THE SOFTWARE FOR ANY INCIDENTAL, SPECIAL, OR CONSEQUENTIAL DAMAGES OR LOSS AS A RESULT OF USING, MODIFYING OR DISTRIBUTING PYTHON 1.6b1, OR ANY DERIVATIVE THEREOF, EVEN IF ADVISED OF THE POSSIBILITY THEREOF.

6. This License Agreement will automatically terminate upon a material breach of its terms and conditions.

7. This License Agreement shall be governed by and interpreted in all respects by the law of the State of Virginia, excluding conflict of law provisions. Nothing in this License Agreement shall be deemed to create any relationship of agency, partnership, or joint venture between CNRI and Licensee. This License Agreement does not grant permission to use CNRI trademarks or trade name in a trademark sense to endorse or promote products or services of Licensee, or any third party. 8. By clicking on the "ACCEPT" button where indicated, or by copying, installing or otherwise using Python 1.6b1, Licensee agrees to be bound by the terms and conditions of this License Agreement.

ACCEPT CWI LICENSE AGREEMENT FOR PYTHON 0.9.0 THROUGH 1.2 ---------- ---------- Copyright (c) 1991 - 1995, Stichting Mathematisch Centrum Amsterdam, The Netherlands. All rights reserved. Permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Stichting Mathematisch Centrum or CWI not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission.

STICHTING MATHEMATISCH CENTRUM DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, IN NO EVENT SHALL STICHTING MATHEMATISCH CENTRUM BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES

OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

ØMQ Licensing

ZeroMQ Free Software Licenses

The libzmq library is licensed under the GNU Lesser General Public License V3 plus a static linking exception.

•You get the full source code. You can examine the code, modify it, and share your modified code under the terms of the LGPL.

•Static linking exception. The copyright holders give you permission to link this library with independent modules to produce an executable, regardless of the license terms of these independent modules, and to copy and distribute the resulting executable under terms of your choice, provided that you also meet, for each linked independent module, the terms and conditions of the license of that module. An independent module is a module which is not derived from or based on this library. If you modify this library, you must extend this exception to your version of the library.

ZeroMQ for Commercial Applications

•ZeroMQ is safe for use in close-source applications. The LGPL share-alike terms do not apply to applications built on top of ZeroMQ.

•You do not need a commercial license. The LGPL applies to ZeroMQ's own source code, not your applications. Many commercial applications use ZeroMQ. Intent to

Move to MPL v2

It is the intention of the ZeroMQ community to move gradually towards the Mozilla Public License v2, as a replacement for the current LGPLv3 + static link exception.

MPLv2 offers largely the same advantages as our custom LGPLv3 + static link exception license, with the added advantage of being a standard license, thus easier for corporate lawyers to accept.

MPLv2 is the recommended license for new ZeroMQ projects, and where possible, ZeroMQ projects should collect approval from contributors to move towards MPLv2.

Cython License

Apache License
Version 2.0, January 2004
http://www.apache.org/licenses/

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition,"control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems,

and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

(a) You must give any other recipients of the Work or Derivative Works a copy of this License; and

(b) You must cause any modified files to carry prominent notices stating that You changed the files; and

(c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and

(d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License.

You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with thisLicense. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

OLA

The OLA framework and C++ client library is licensed under the LGPL. The OLA Daemon (olad) is licenced under the GPL.

GNU LESSER GENERAL PUBLIC LICENSE
Version 3, 29 June 2007

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

This version of the GNU Lesser General Public License incorporates the terms and conditions of version 3 of the GNU General Public License, supplemented by the additional permissions listed below.

0. Additional Definitions.

As used herein, “this License” refers to version 3 of the GNU Lesser General Public License, and the “GNU GPL” refers to version 3 of the GNU General Public License.

“The Library” refers to a covered work governed by this License, other than an Application or a Combined Work as defined below.

An “Application” is any work that makes use of an interface provided by the Library, but which is not otherwise based on the Library. Defining a subclass of a class defined by the Library is deemed a mode of using an interface provided by the Library.

A “Combined Work” is a work produced by combining or linking an Application with the Library. The particular version of the Library with which the Combined Work was made is also called the “Linked Version”.

The “Minimal Corresponding Source” for a Combined Work means the Corresponding Source for the Combined Work, excluding any source code for portions of the Combined Work that, considered in isolation, are based on the Application, and not on the Linked Version.

The “Corresponding Application Code” for a Combined Work means the object code and/or source code for the Application, including any data and utility programs needed for reproducing the Combined Work from the Application, but excluding the System Libraries of the Combined Work.

1. Exception to Section 3 of the GNU GPL.

You may convey a covered work under sections 3 and 4 of this License without being bound by section 3 of the GNU GPL.

2. Conveying Modified Versions.

If you modify a copy of the Library, and, in your modifications, a facility refers to a function or data to be supplied by an Application that uses the facility (other than as an argument passed when the facility is invoked), then you may convey a copy of the modified version:

a) under this License, provided that you make a good faith effort to ensure that, in the event an Application does not supply the function or data, the facility still operates, and performs whatever part of its purpose remains meaningful, or

b) under the GNU GPL, with none of the additional permissions of this License applicable to that copy.

3. Object Code Incorporating Material from Library Header Files.

The object code form of an Application may incorporate material from a header file that is part of the Library. You may convey such object code under terms of your choice, provided that, if the incorporated material is not limited to numerical parameters, data structure layouts and accessors, or small macros, inline functions and templates (ten or fewer lines in length), you do both of the following:

a) Give prominent notice with each copy of the object code that the Library is used in it and that the Library and its use are covered by this License.

b) Accompany the object code with a copy of the GNU GPL and this license document.

4. Combined Works.

You may convey a Combined Work under terms of your choice that, taken together, effectively do not restrict modification of the portions of the Library contained in the Combined Work and reverse engineering for debugging such modifications, if you also do each of the following:

a) Give prominent notice with each copy of the Combined Work that the Library is used in it and that the Library and its use are covered by this License.

b) Accompany the Combined Work with a copy of the GNU GPL and this license document.

c) For a Combined Work that displays copyright notices during execution, include the copyright notice for the Library among these notices, as well as a reference directing the user to the copies of the GNU GPL and this license document.

d) Do one of the following:

0) Convey the Minimal Corresponding Source under the terms of this License, and the Corresponding Application Code in a form suitable for, and under terms that permit, the user to recombine or relink the Application with a modified version of the Linked Version to produce a modified Combined Work, in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.

1) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (a) uses at run time a copy of the Library already present on the user's computer system, and (b) will operate properly with a modified version of the Library that is interface-compatible with the Linked Version.

e) Provide Installation Information, but only if you would otherwise be required to provide such information under section 6 of the GNU GPL, and only to the extent that such information is necessary to install and execute a modified version of the Combined Work produced by recombining or relinking the Application with a modified version of the Linked Version. (If you use option 4d0, the Installation Information must accompany the Minimal Corresponding Source and Corresponding Application Code. If you use option 4d1, you must provide the Installation Information in the manner specified by section 6 of the GNU GPL for conveying Corresponding Source.)

5. Combined Libraries.

You may place library facilities that are a work based on the Library side by side in a single library together with other library facilities that are not Applications and are not covered by this License, and convey such a combined library under terms of your choice, if you do both of the following:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities, conveyed under the terms of this License.

b) Give prominent notice with the combined library that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

6. Revised Versions of the GNU Lesser General Public License.

The Free Software Foundation may publish revised and/or new versions of the GNU Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library as you received it specifies that a certain numbered version of the GNU Lesser General Public License “or any later version” applies to it, you have the option of following the terms and conditions either of that published version or of any later version published by the Free Software Foundation. If the Library as you received it does not specify a version number of the GNU Lesser General Public License, you may choose any version of the GNU Lesser General Public License ever published by the Free Software Foundation.

If the Library as you received it specifies that a proxy can decide whether future versions of the GNU Lesser General Public License shall apply, that proxy's public statement of acceptance of any version is permanent authorization for you to choose that version for the Library.

GNU GENERAL PUBLIC LICENSE
Version 3, 29 June 2007

Preamble

The GNU General Public License is a free, copyleft license for software and other kinds of works.

The licenses for most software and other practical works are designed to take away your freedom to share and change the works. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change all versions of a program--to make sure it remains free software for all its users. We, the Free Software Foundation, use the GNU General Public License for most of our software; it applies also to any other work released this way by its authors. You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for them if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs, and that you know you can do these things.

To protect your rights, we need to prevent others from denying you these rights or asking you to surrender the rights. Therefore, you have certain responsibilities if you distribute copies of the software, or if you modify it: responsibilities to respect the freedom of others.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must pass on to the recipients the same freedoms that you received. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

Developers that use the GNU GPL protect your rights with two steps: (1) assert copyright on the software, and (2) offer you this License giving you legal permission to copy, distribute and/or modify it.

For the developers' and authors' protection, the GPL clearly explains that there is no warranty for this free software. For both users' and authors' sake, the GPL requires that modified versions be marked as changed, so that their problems will not be attributed erroneously to authors of previous versions.

Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS

0. Definitions.

“This License” refers to version 3 of the GNU General Public License.

“Copyright” also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

“The Program” refers to any copyrightable work licensed under this License. Each licensee is addressed as “you”. “Licensees” and “recipients” may be individuals or organizations.

To “modify” a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a “modified version” of the earlier work or a work “based on” the earlier work.

A “covered work” means either the unmodified Program or a work based on the Program.

To “propagate” a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the public, and in some countries other activities as well.

To “convey” a work means any kind of propagation that enables other parties to make or r receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays “Appropriate Legal Notices” to the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

1. Source Code.

The “source code” for a work means the preferred form of the work for making modifications to it. “Object code” means any non-source form of a work.

A “Standard Interface” means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The “System Libraries” of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A “Major Component”, in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The “Corresponding Source” for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

2. Basic Permissions.

All rights granted under this License are granted for the term of copyright on the Program, and are irrevocable provided the stated conditions are met. This License explicitly affirms your unlimited permission to run the unmodified Program. The output from running a covered work is covered by this License only if the output, given its content, constitutes a covered work. This License acknowledges your rights of fair use or other equivalent, as provided by copyright law.

You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

3. Protecting Users' Legal Rights From Anti-Circumvention Law.

No covered work shall be deemed part of an effective technological measure under any applicable law fulfilling obligations under article 11 of the WIPO copyright treaty adopted on 20 December 1996, or similar laws prohibiting or restricting circumvention of such measures.

When you convey a covered work, you waive any legal power to forbid circumvention of technological measures to the extent such circumvention is effected by exercising rights under this License with respect to the covered work, and you disclaim any intention to limit operation or modification of the work as a means of enforcing, against the work's users, your or third parties' legal rights to forbid circumvention of technological measures.

4. Conveying Verbatim Copies.

You may convey verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice; keep intact all notices stating that this License and any non-permissive terms added in accord with section 7 apply to the code; keep intact all notices of the absence of any warranty; and give all recipients a copy of this License along with the Program.

You may charge any price or no price for each copy that you convey, and you may offer support or warranty protection for a fee.

5. Conveying Modified Source Versions.

You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

> a) The work must carry prominent notices stating that you modified it, and giving a relevant date.
>
> b) The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to “keep intact all notices”.
>
> c) You must license the entire work, as a whole, under this License to anyone who comes into possession of a copy. This License will therefore apply, along with any applicable section 7 additional terms, to the whole of the work, and all its parts, regardless of how they are packaged. This License gives no permission to license the work in any other way, but it does not invalidate such permission if you have separately received it.
>
> d) If the work has interactive user interfaces, each must display Appropriate Legal Notices; however, if the Program has interactive interfaces that do not display Appropriate Legal Notices, your work need not make them do so.

A compilation of a covered work with other separate and independent works, which are not by their nature extensions of the covered work, and which are not combined with it such as to form a larger program, in or on a volume of a storage or distribution medium, is called an “aggregate” if the compilation and its resulting copyright are not used to limit the access or legal rights of the compilation's users beyond what the individual works permit. Inclusion of a covered work in an aggregate does not cause this License to apply to the other parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms of sections 4 and 5, provided that you also convey the machine-readable Corresponding Source under the terms of this License, in one of these ways:

a) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

d) Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

A separable portion of the object code, whose source code is excluded from the Corresponding Source as a System Library, need not be included in conveying the object code work.

A “User Product” is either (1) a “consumer product”, which means any tangible personal property which is normally used for personal, family, or household purposes, or (2) anything designed or sold for incorporation into a dwelling. In determining whether a product is a consumer product, doubtful cases shall be resolved in favor of coverage. For a particular product received by a particular user, “normally used” refers to a typical or common use of that class of product, regardless of the status of the particular user or of the way in which the particular user actually uses, or expects or is expected to use, the product. A product is a consumer product regardless of whether the product has substantial commercial, industrial or non-consumer uses, unless such uses represent the only significant mode of use of the product.

“Installation Information” for a User Product means any methods, procedures, authorization keys, or other information required to install and execute modified versions of a covered work in that User Product from a modified version of its Corresponding Source. The information must suffice to ensure that the continued functioning of the modified object code is in no case prevented or interfered with solely because modification has been made.

If you convey an object code work under this section in, or with, or specifically for use in, a User Product, and the conveying occurs as part of a transaction in which the right of possession and use of the User Product is transferred to the recipient in perpetuity or for a fixed term (regardless of how the transaction is characterized), the Corresponding Source conveyed under this section must be accompanied by the Installation Information. But this requirement does not apply if neither you nor any third party retains the ability to install modified object code on the User Product (for example, the work has been installed in ROM).

The requirement to provide Installation Information does not include a requirement to continue to provide support service, warranty, or updates for a work that has been modified or installed by the recipient, or for the User Product in which it has been modified or installed. Access to a network may be denied when the modification itself materially and adversely affects the operation of the network or violates the rules and protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided, in accord with this section must be in a format that is publicly documented (and with an implementation available to the public in source code form), and must require no special password or key for unpacking, reading or copying.

7. Additional Terms.

“Additional permissions” are terms that supplement the terms of this License by making exceptions from one or more of its conditions. Additional permissions that are applicable to the entire Program shall be treated as though they were included in this License, to the extent that they are valid under applicable law. If additional permissions apply only to part of the Program, that part may be used separately under those permissions, but the entire Program remains governed by this License without regard to the additional permissions.

When you convey a copy of a covered work, you may at your option remove any additional permissions from that copy, or from any part of it. (Additional permissions may be written to require their own removal in certain cases when you modify the work.) You may place additional permissions on material, added by you to a covered work, for which you have or can give appropriate copyright permission.

Notwithstanding any other provision of this License, for material you add to a covered work, you may (if authorized by the copyright holders of that material) supplement the terms of this License with terms:

a) Disclaiming warranty or limiting liability differently from the terms of sections 15 and 16 of this License; or

b) Requiring preservation of specified reasonable legal notices or author attributions in that material or in the Appropriate Legal Notices displayed by works containing it; or.

c) Prohibiting misrepresentation of the origin of that material, or requiring that modified versions of such material be marked in reasonable ways as different from the original version; or

d) Limiting the use for publicity purposes of names of licensors or authors of the material; or

e) Declining to grant rights under trademark law for use of some trade names, trademarks, or service marks; or

f) Requiring indemnification of licensors and authors of that material by anyone who conveys the material (or modified versions of it) with contractual assumptions of liability to the recipient, for any liability that these contractual assumptions directly impose on those licensors and authors.

All other non-permissive additional terms are considered “further restrictions” within the meaning of section 10. If the Program as you received it, or any part of it, contains a notice stating that it is governed by this License along with a term that is a further restriction, you may remove that term. If a license document contains a further restriction but permits relicensing or conveying under this License, you may add to a covered work material governed by the terms of that license document, provided that the further restriction does not survive such relicensing or conveying.

If you add terms to a covered work in accord with this section, you must place, in the relevant source files, a statement of the additional terms that apply to those files, or a notice indicating where to find the applicable terms.

Additional terms, permissive or non-permissive, may be stated in the form of a separately written license, or stated as exceptions; the above requirements apply either way.

8. Termination.

You may not propagate or modify a covered work except as expressly provided under this License. Any attempt otherwise to propagate or modify it is void, and will automatically terminate your rights under this License (including any patent licenses granted under the third paragraph of section 11).

However, if you cease all violation of this License, then your license from a particular copyright holder is reinstated (a) provisionally, unless and until the copyright holder explicitly and finally terminates your license, and (b) permanently, if the copyright holder fails to notify you of the violation by some reasonable means prior to 60 days after the cessation.

Moreover, your license from a particular copyright holder is reinstated permanently if the copyright holder notifies you of the violation by some reasonable means, this is the first time you have received notice of violation of this License (for any work) from that copyright holder, and you cure the violation prior to 30 days after your receipt of the notice.

Termination of your rights under this section does not terminate the licenses of parties who have received copies or rights from you under this License. If your rights have been terminated and not permanently reinstated, you do not qualify to receive new licenses for the same material under section 10.

9. Acceptance Not Required for Having Copies.

You are not required to accept this License in order to receive or run a copy of the Program. Ancillary propagation of a covered work occurring solely as a consequence of using peer-to-peer transmission to receive a copy likewise does not require acceptance. However, nothing other than this License grants you permission to propagate or modify any covered work. These actions infringe copyright if you do not accept this License. Therefore, by modifying or propagating a covered work, you indicate your acceptance of this License to do so.

10. Automatic Licensing of Downstream Recipients.

Each time you convey a covered work, the recipient automatically receives a license from the original licensors, to run, modify and propagate that work, subject to this License. You are not responsible for enforcing compliance by third parties with this License.

An “entity transaction” is a transaction transferring control of an organization, or substantially all assets of one, or subdividing an organization, or merging organizations. If propagation of a covered work results from an entity transaction, each party to that transaction who receives a copy of the work also receives whatever licenses to the work the party's predecessor in interest had or could give under the previous paragraph, plus a right to possession of the Corresponding Source of the work from the predecessor in interest, if the predecessor has it or can get it with reasonable efforts.

You may not impose any further restrictions on the exercise of the rights granted or affirmed under this License. For example, you may not impose a license fee, royalty, or other charge for exercise of rights granted under this License, and you may not initiate litigation (including a cross-claim or counterclaim in a lawsuit) alleging that any patent claim is infringed by making, using, selling, offering for sale, or importing the Program or any portion of it.

11. Patents.

A “contributor” is a copyright holder who authorizes use under this License of the Program or a work on which the Program is based. The work thus licensed is called the contributor's “contributor version”.

A contributor's “essential patent claims” are all patent claims owned or controlled by the contributor, whether already acquired or hereafter acquired, that would be infringed by some manner, permitted by this License, of making, using, or selling its contributor version, but do not include claims that would be infringed only as a consequence of further modification of the contributor version. For purposes of this definition, “control” includes the right to grant patent sublicenses in a manner consistent with the requirements of this License.

Each contributor grants you a non-exclusive, worldwide, royalty-free patent license under the contributor's essential patent claims, to make, use, sell, offer for sale, import and otherwise run, modify and propagate the contents of its contributor version.

In the following three paragraphs, a “patent license” is any express agreement or commitment, however denominated, not to enforce a patent (such as an express permission to practice a patent or covenant not to sue for patent infringement). To “grant” such a patent license to a party means to make such an agreement or commitment not to enforce a patent against the party.

If you convey a covered work, knowingly relying on a patent license, and the Corresponding Source of the work is not available for anyone to copy, free of charge and under the terms of this License, through a publicly available network server or other readily accessible means, then you must either (1) cause the Corresponding Source to be so available, or (2) arrange to deprive yourself of the benefit of the patent license for this particular work, or (3) arrange, in a manner consistent with the requirements of this License, to extend the patent license to downstream recipients. “Knowingly relying” means you have actual knowledge that, but for the patent license, your conveying the covered work in a country, or your recipient's use of the covered work in a country, would infringe one or more identifiable patents in that country that you have reason to believe are valid.

If, pursuant to or in connection with a single transaction or arrangement, you convey, or propagate by procuring conveyance of, a covered work, and grant a patent license to some of the parties receiving the covered work authorizing them to use, propagate, modify or convey a specific copy of the covered work, then the patent license you grant is automatically extended to all recipients of the covered work and works based on it.

A patent license is “discriminatory” if it does not include within the scope of its coverage, prohibits the exercise of, or is conditioned on the non-exercise of one or more of the rights that are specifically granted under this License. You may not convey a covered work if you are a party to an arrangement with a third party that is in the business of distributing software, under which you make payment to the third party based on the extent of your activity of conveying the work, and under which the third party grants, to any of the parties who would receive the covered work from you, a discriminatory patent license (a) in connection with copies of the covered work conveyed by you (or copies made from those copies), or (b) primarily for and in connection with specific products or compilations that

contain the covered work, unless you entered into that arrangement, or that patent license was granted, prior to 28 March 2007.

Nothing in this License shall be construed as excluding or limiting any implied license or other defenses to infringement that may otherwise be available to you under applicable patent law.

12. No Surrender of Others' Freedom.

If conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot convey a covered work so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not convey it at all. For example, if you agree to terms that obligate you to collect a royalty for further conveying from those to whom you convey the Program, the only way you could satisfy both those terms and this License would be to refrain entirely from conveying the Program.

13. Use with the GNU Affero General Public License.

Notwithstanding any other provision of this License, you have permission to link or combine any covered work with a work licensed under version 3 of the GNU Affero General Public License into a single combined work, and to convey the resulting work. The terms of this License will continue to apply to the part which is the covered work, but the special requirements of the GNU Affero General Public License, section 13, concerning interaction through a network will apply to the combination as such.

14. Revised Versions of this License.

The Free Software Foundation may publish revised and/or new versions of the GNU General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies that a certain numbered version of the GNU General Public License “or any later version” applies to it, you have the option of following the terms and conditions either of that numbered version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of the GNU General Public License, you may choose any version ever published by the Free Software Foundation.

If the Program specifies that a proxy can decide which future versions of the GNU General Public License can be used, that proxy's public statement of acceptance of a version permanently authorizes you to choose that version for the Program.

Later license versions may give you additional or different permissions. However, no additional obligations are imposed on any author or copyright holder as a result of your choosing to follow a later version.

15. Disclaimer of Warranty.

THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND

FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. Limitation of Liability.

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MODIFIES AND/OR CONVEYS THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

17. Interpretation of Sections 15 and 16.

If the disclaimer of warranty and limitation of liability provided above cannot be given local legal effect according to their terms, reviewing courts shall apply local law that most closely approximates an absolute waiver of all civil liability in connection with the Program, unless a warranty or assumption of liability accompanies a copy of the Program in return for a fee.

END OF TERMS AND CONDITIONS

Crypto-JS

(c) 2009-2013 by Jeff Mott. All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

Redistributions of source code must retain the above copyright notice, this list of conditions, and the following disclaimer.

Redistributions in binary form must reproduce the above copyright notice, this list of conditions, and the following disclaimer in the documentation or other materials provided with the distribution.

Neither the name CryptoJS nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS," AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

JavaScript code modules

Mozilla Public License
Version 2.0

1. Definitions

1.1. “Contributor” means each individual or legal entity that creates, contributes to the creation of, or owns Covered Software.
1.2. “Contributor Version” means the combination of the Contributions of others (if any) used by a Contributor and that particular Contributor’s Contribution.
1.3. “Contribution” means Covered Software of a particular Contributor.
1.4. “Covered Software” means Source Code Form to which the initial Contributor has attached the notice in Exhibit A, the Executable Form of such Source Code Form, and Modifications of such Source Code Form, in each case including portions thereof.
1.5. “Incompatible With Secondary Licenses” means
a) that the initial Contributor has attached the notice described in Exhibit B to the Covered Software; or
b) that the Covered Software was made available under the terms of version 1.1 or earlier of the License, but not also under the terms of a Secondary License.
1.6. “Executable Form” means any form of the work other than Source Code Form.
1.7. “Larger Work” means a work that combines Covered Software with other material, in a separate file or files, that is not Covered Software.
1.8. “License” means this document.
1.9. “Licensable” means having the right to grant, to the maximum extent possible, whether at the time of the initial grant or subsequently, any and all of the rights conveyed by this License.
1.10. “Modifications” means any of the following:
a) any file in Source Code Form that results from an addition to, deletion from, or modification of the contents of Covered Software; or
b) any new file in Source Code Form that contains any Covered Software.
1.11. “Patent Claims” of a Contributor means any patent claim(s), including without limitation, method, process, and apparatus claims, in any patent Licensable by such Contributor that would be infringed, but for the grant of the License, by the making, using, selling, offering for sale, having made, import, or transfer of either its Contributions or its Contributor Version.
1.12. “Secondary License” means either the GNU General Public License, Version 2.0, the GNU Lesser General Public License, Version 2.1, the GNU Affero General Public License, Version 3.0, or any later versions of those licenses.
1.13. “Source Code Form” means the form of the work preferred for making modifications.
1.14. “You” (or “Your”) means an individual or a legal entity exercising rights under this License. For legal entities, “You” includes any entity that controls, is controlled by, or is under common control with You. For purposes of this definition, “control” means (a) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (b) ownership of more than fifty percent (50%) of the outstanding shares or beneficial ownership of such entity.

2. License Grants and Conditions

2.1. Grants Each Contributor hereby grants You a world-wide, royalty-free, non-exclusive license:
a) under intellectual property rights (other than patent or trademark) Licensable by such Contributor to use, reproduce, make available, modify, display, perform, distribute, and otherwise exploit its Contributions, either on an unmodified basis, with

Modifications, or as part of a Larger Work; and

b) under Patent Claims of such Contributor to make, use, sell, offer for sale, have made, import, and otherwise transfer either its Contributions or its Contributor Version.

2.2. Effective Date
The licenses granted in Section 2.1 with respect to any Contribution become effective for each Contribution on the date the Contributor first distributes such Contribution.

2.3. Limitations on Grant Scope
The licenses granted in this Section 2 are the only rights granted under this License. No additional rights or licenses will be implied from the distribution or licensing of Covered Software under this License. Notwithstanding Section 2.1(b) above, no patent license is granted by a Contributor:

a) for any code that a Contributor has removed from Covered Software; or
b) for infringements caused by: (i) Your and any other third party's modifications of Covered Software, or (ii) the combination of its Contributions with other software (except as part of its Contributor Version); or
c) under Patent Claims infringed by Covered Software in the absence of its Contributions.

This License does not grant any rights in the trademarks, service marks, or logos of any Contributor (except as may be necessary to comply with the notice requirements in Section 3.4).

2.4. Subsequent Licenses
No Contributor makes additional grants as a result of Your choice to distribute the Covered Software under a subsequent version of this License (see Section 10.2) or under the terms of a Secondary License (if permitted under the terms of Section 3.3).

2.5. Representation
Each Contributor represents that the Contributor believes its Contributions are its original creation(s) or it has sufficient rights to grant the rights to its Contributions conveyed by this License.

2.6. Fair Use
This License is not intended to limit any rights You have under applicable copyright doctrines of fair use, fair dealing, or other equivalents.

2.7. Conditions
Sections 3.1, 3.2, 3.3, and 3.4 are conditions of the licenses granted in Section 2.1.

3. Responsibilities
3.1. Distribution of Source Form
All distribution of Covered Software in Source Code Form, including any Modifications that You create or to which You contribute, must be under the terms of this License. You must inform recipients that the Source Code Form of the Covered Software is governed by the terms of this License, and how they can obtain a copy of this License. You may not attempt to alter or restrict the recipients' rights in the Source Code Form.

3.2. Distribution of Executable Form
If You distribute Covered Software in Executable Form then:

a)such Covered Software must also be made available in Source Code Form, as described in Section 3.1, and You must inform recipients of the Executable Form how they can obtain a copy of such Source Code Form by reasonable means in a timely manner, at a charge no more than the cost of distribution to the recipient; and

b)You may distribute such Executable Form under the terms of this License, or sublicense it under different terms, provided that the license for the Executable Form does not attempt to limit or alter the recipients' rights in the Source Code Form under this License.

3.3. Distribution of a Larger Work
You may create and distribute a Larger Work under terms of Your choice, provided that You also comply with the requirements of this License for the Covered Software. If the Larger Work is a combination of Covered Software with a work governed by one or more Secondary Licenses, and the Covered Software is not Incompatible With Secondary Licenses, this License permits You to additionally distribute such Covered Software under the terms of such Secondary License(s), so that the recipient of the Larger Work may, at their option, further distribute the Covered Software under the terms of either this License or such Secondary License(s).

3.4. Notices
You may not remove or alter the substance of any license notices (including copyright notices, patent notices, disclaimers of warranty, or limitations of liability) contained within the Source Code Form of the Covered Software, except that You may alter any license notices to the extent required to remedy known factual inaccuracies.

3.5. Application of Additional Terms
You may choose to offer, and to charge a fee for, warranty, support, indemnity or liability obligations to one or more recipients of Covered Software. However, You may do so only on Your own behalf, and not on behalf of any Contributor. You must make it absolutely clear that any such warranty, support, indemnity, or liability obligation is offered by You alone, and You hereby agree to indemnify every Contributor for any liability incurred by such Contributor as a result of warranty, support, indemnity or liability terms You offer. You may include additional disclaimers of warranty and limitations of liability specific to any jurisdiction.

4. Inability to Comply Due to Statute or Regulation
If it is impossible for You to comply with any of the terms of this License with respect to some or all of the Covered Software due to statute, judicial order, or regulation then You must: (a) comply with the terms of this License to the maximum extent possible; and (b) describe the limitations and the code they affect. Such description must be placed in a text file included with all distributions of the Covered Software under this License. Except to the extent prohibited by statute or regulation, such description must be sufficiently detailed for a recipient of ordinary skill to be able to understand it.

5. Termination
5.1. The rights granted under this License will terminate automatically if You fail to comply with any of its terms. However, if You become compliant, then the rights granted under this License from a particular Contributor are reinstated (a) provisionally, unless and until such Contributor explicitly and finally terminates Your grants, and (b) on an ongoing basis, if such Contributor fails to notify You of the non-compliance by some reasonable means prior to 60 days after You have come back into compliance. Moreover, Your grants from a particular Contributor are reinstated on an ongoing basis if such Contributor notifies You of the non-compliance by some reasonable means, this is the first time You have received notice of non-compliance with this License from such Contributor, and You become compliant prior to 30 days after Your receipt of the notice.

5.2. If You initiate litigation against any entity by asserting a patent infringement claim (excluding declaratory judgment actions, counter-claims, and cross-claims) alleging that a Contributor Version directly or indirectly infringes any patent, then the rights granted to You by any and all Contributors for the Covered Software under Section 2.1 of this License shall terminate.

5.3. In the event of termination under Sections 5.1 or 5.2 above, all end user license agreements (excluding distributors and resellers) which have been validly granted by You or Your distributors under this License prior to termination shall survive termination.

6. Disclaimer of Warranty

Covered Software is provided under this License on an “as is” basis, without warranty of any kind, either expressed, implied, or statutory, including, without limitation, warranties that the Covered Software is free of defects, merchantable, fit for a particular purpose or non-infringing. The entire risk as to the quality and performance of the Covered Software is with You. Should any Covered Software prove defective in any respect, You (not any Contributor) assume the cost of any necessary servicing, repair, or correction. This disclaimer of warranty constitutes an essential part of this License. No use of any Covered Software is authorized under this License except under this disclaimer.

7. Limitation of Liability

Under no circumstances and under no legal theory, whether tort (including negligence), contract, or otherwise, shall any Contributor, or anyone who distributes Covered Software as permitted above, be liable to You for any direct, indirect, special, incidental, or consequential damages of any character including, without limitation, damages for lost profits, loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses, even if such party shall have been informed of the possibility of such damages. This limitation of liability shall not apply to liability for death or personal injury resulting from such party’s negligence to the extent applicable law prohibits such limitation. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so this exclusion and limitation may not apply to You.

8. Litigation

Any litigation relating to this License may be brought only in the courts of a jurisdiction where the defendant maintains its principal place of business and such litigation shall be governed by laws of that jurisdiction, without reference to its conflict-of-law provisions. Nothing in this Section shall prevent a party’s ability to bring cross-claims or counter-claims.

9. Miscellaneous

This License represents the complete agreement concerning the subject matter hereof. If any provision of this License is held to be unenforceable, such provision shall be reformed only to the extent necessary to make it enforceable. Any law or regulation which provides that the language of a contract shall be construed against the drafter shall not be used to construe this License against a Contributor.

10. Versions of the License

10.1. New Versions

Mozilla Foundation is the license steward. Except as provided in Section 10.3, no one other than the license steward has the right to modify or publish new versions of this License. Each version will be given a distinguishing version number.

10.2. Effect of New Versions

You may distribute the Covered Software under the terms of the version of the License under which You originally received the Covered Software, or under the terms of any subsequent version published by the license steward.

10.3. Modified Versions

If you create software not governed by this License, and you want to create a new license for such software, you may create and use a modified version of this License if you rename the license and remove any references to the name of the license steward (except to note that such modified license differs from this License).

10.4. Distributing Source Code Form that is Incompatible With Secondary Licenses If You choose to distribute Source Code Form that is Incompatible With Secondary Licenses under the terms of this version of the License, the notice described in Exhibit B of this License must be attached.

Exhibit A - Source Code Form License Notice
This Source Code Form is subject to the terms of the Mozilla Public License, v. 2.0. If a copy of the MPL was not distributed with this file, You can obtain one at https://mozilla.org/MPL/2.0/.
If it is not possible or desirable to put the notice in a particular file, then You may include the notice in a location (such as a LICENSE file in a relevant directory) where a recipient would be likely to look for such a notice.
You may add additional accurate notices of copyright ownership.

Exhibit B - “Incompatible With Secondary Licenses” Notice
This Source Code Form is “Incompatible With Secondary Licenses”, as defined by the Mozilla Public License, v. 2.0.

MessagePack

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.