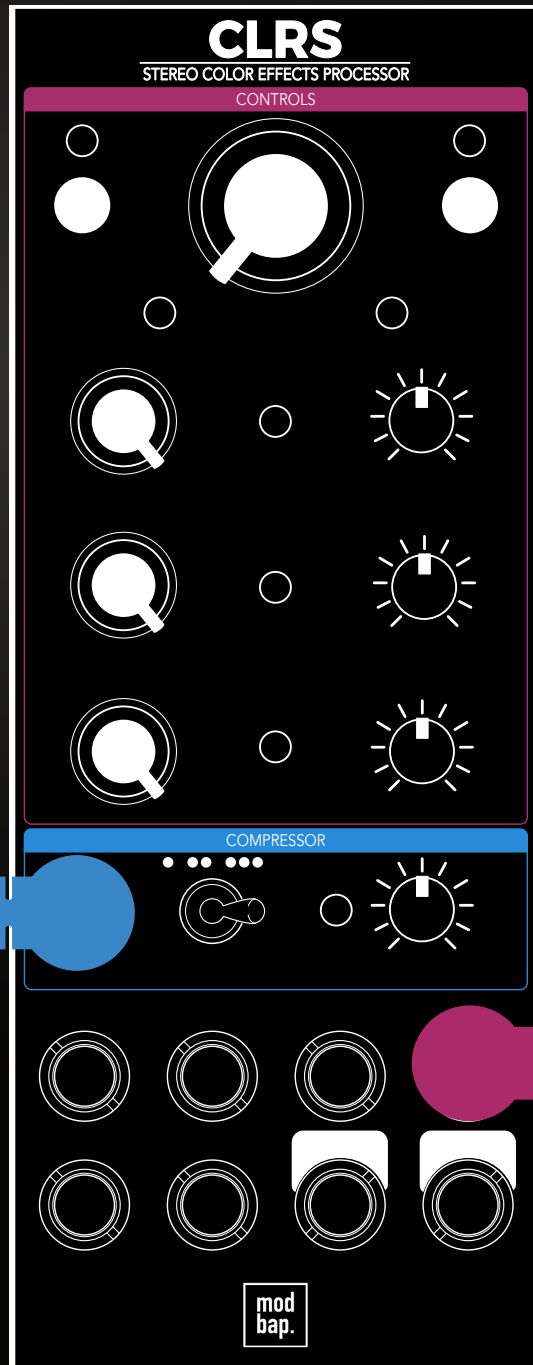


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# CLRS

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STEREO COLOR EFFECTS PROCESSOR







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# About Us

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## MODBAP MODULAR BY BEATPPL

Modbap Modular is a line of eurorack modular synthesizers and electronic music instruments by Beatppl. Founded by Corry Banks (Bboytech), Modbap Modular was born of the Modbap Movement with a simple mission to dev tools for beat driven hiphop leaning modular artists. It is our goal to develop eurorack modules from the beatmaker's perspective while adding value for music makers of all genres.

It's almost impossible to explain Modbap Modular without answering the questions; "So, what is ModBap?" MODBAP is the fusion of modular synthesis and boom-bap (or any form of hiphop) music production. The term was created by BBoyTech as a denotation of his experiments with modular synthesis and boombap music production. From that point forward, a movement was born where like minded creatives built a community around idea of Modbap. Modbap Modular is in effect, the result of that movement in a space where we'd previously not existed.

**BUILT FOR EURORACK  
DOPE ENOUGH FOR BOOMBAP!**

[www.modbap.com](http://www.modbap.com)





# Overview

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## CLRS

Introducing the Modbap Eurorack module, CLRS (Colors), a powerful and versatile stereo module that takes inspiration from the Modbap CLRS module and introduces exciting new features for an enhanced audio experience. At the heart of CLRS is the big filter knob, a performable DJ-style low-pass and high-pass filter. CLRS also features the innovative "Mag" knob, a combination of tape saturation and artifact tape characteristics. The "Lofi" knob adjusts the sample rate reduction, emulating the characteristics of lower-quality audio recordings or older digital devices and also features a bit depth reduction control. Introducing an exciting new feature called the "Width" knob allows you to control the stereo widening effect of your audio. CLRS features a one-knob compressor that adds punch and dynamics to your sound. For further control and modulation possibilities, CLRS provides CV inputs for control over the effect amounts. These CV inputs allow you to integrate external control voltages and modulate the parameters of the CLRS module, opening up a world of creative possibilities. With its comprehensive set of features, CLRS is designed to empower audio enthusiasts, producers, and musicians to explore new sonic territories, add vintage warmth, introduce lo-fi aesthetics, widen their stereo image, and enhance their audio with ease and creativity. Get ready to paint your audio canvas with vibrant and captivating soundscapes using the Modbap CLRS module.

## WHAT'S IN THE BOX?

The CLRS package comes with the following items included:-

- CLRS module.
- Eurorack IDC power ribbon cable
- 4 x 3m mounting screws.
- Quick reference guide.
- Sticker.

## SPECIFICATION AND CORE FEATURES

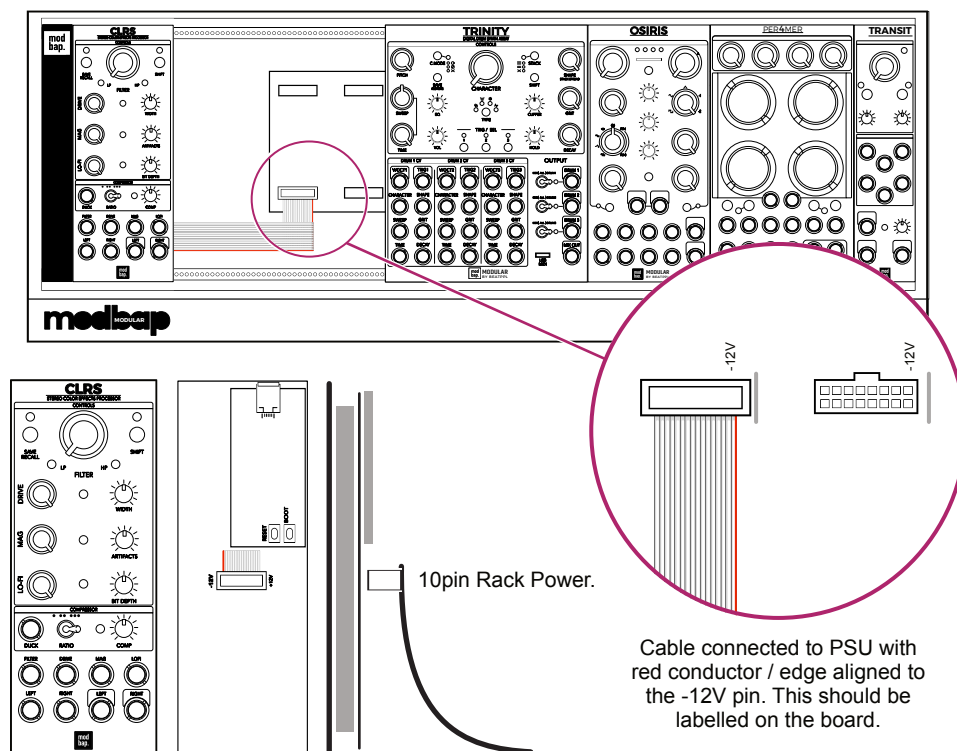
- Module size. 3U, 10 HP, Depth 28mm
- +12V current demand 104mA.
- -12V current demand 8mA
- +5V current demand 0mA
- 5 effects (Drive, Filter, Tape Saturation, LoFi, Compressor.)
- 4 CV inputs for modulating the effects
- Audio stereo channel input and output

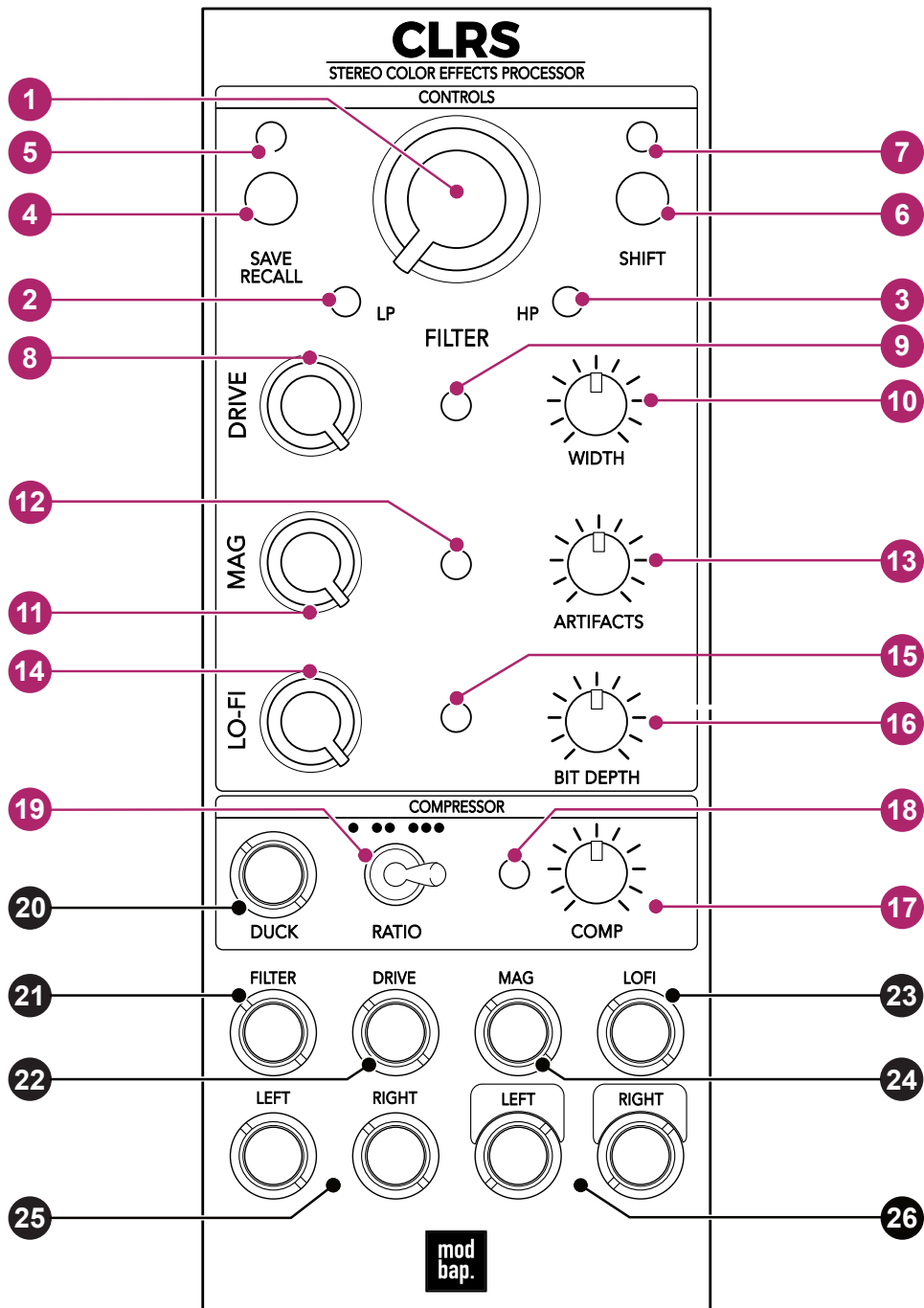


## INSTALLATION

Follow the installation instructions carefully to avoid module or rack damage.

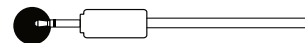
1. Ensure the power connection is disconnected before installing the device.
2. Identify a 10HP free location in the rack to install the module.
3. Connect the 10 pin connector from the IDC ribbon power cable to the header on the rear side of the module. Ensure that the pins are aligned correctly with the red stripe on the ribbon conductor closest to the -12V pin on the header.
4. Insert the cable to the rack and connect the 16 pin side of the IDC ribbon cable to the rack power supply header. Ensure that the pins are aligned correctly with the red stripe on the ribbon conductor closest to the -12V pin on the header.
5. Mount and position the module into the dedicated rack position.
6. Attach the 4 x M3 screws by screwing into the 4 locator holes and the rack mount. Do not over tighten.
7. Power up the rack and observe the module start up.





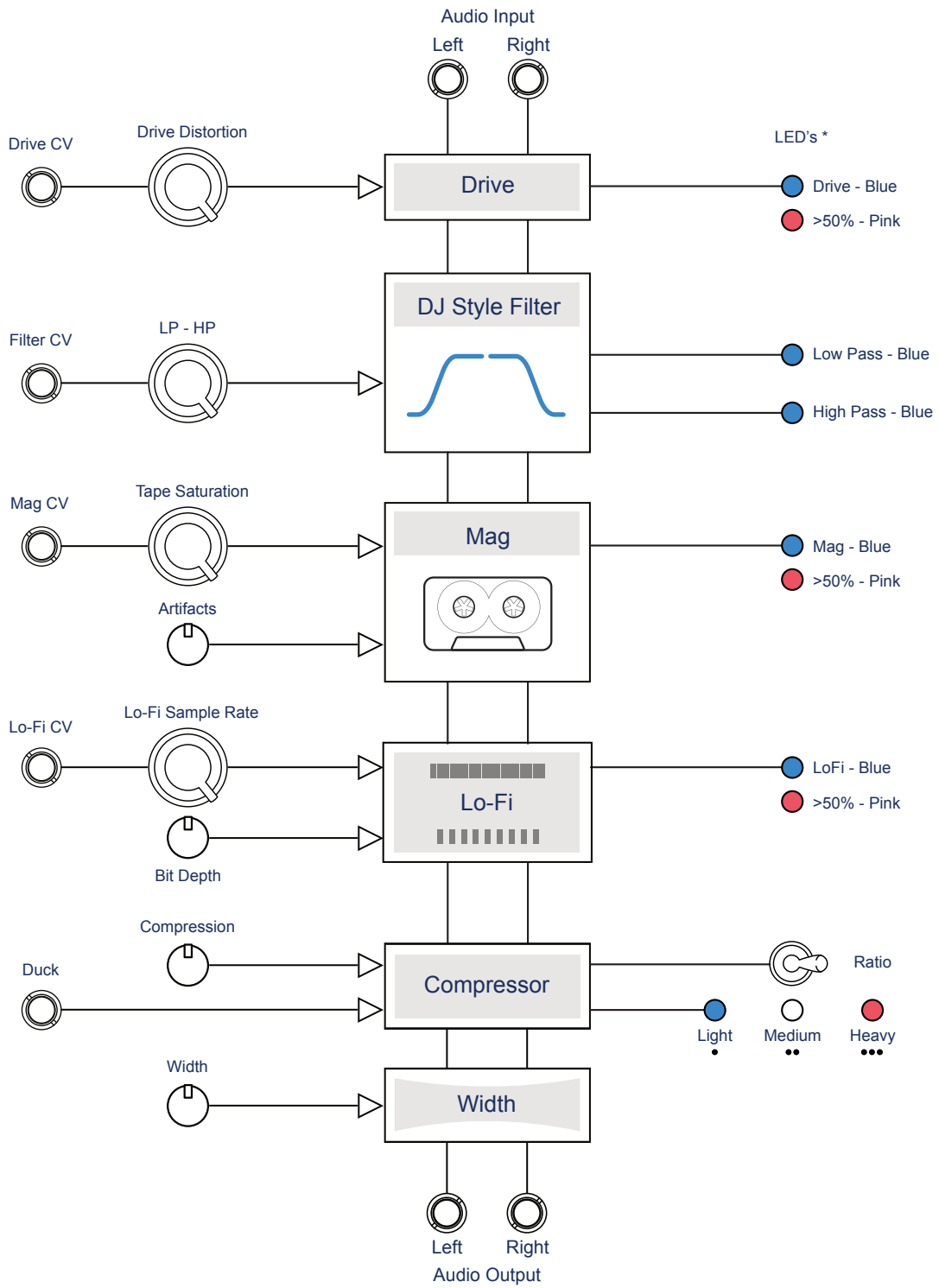
Press, Turn

Plug, Patch



- 1 DJ Style Filter. Low Pass 0-50%, High Pass 50%-100%
- 2 Filter Low Pass Indicator. The brighter the blue LED, the more filtering is applied.
- 3 Filter High Pass Indicator. The brighter the blue LED, the more filtering is applied.
- 4 Preset Save / Recall. Stores 4 states of the device. Recall a preset using shift +.
- 5 Preset LED. Color indicates the current preset selected.
- 6 Shift. Used in conjunction with controls to access secondary function.
- 7 Shift LED.
- 8 Drive. Signal boost & light distortion amount.
- 9 Drive amount LED. Change from blue to pink as >50% drive is applied.
- 10 Width. Stereo widening amount.
- 11 Mag. Cassette tape style saturation and distortion amount.
- 12 Mag LED Indicator \*. Change from blue to pink as >50% distortion is applied.
- 13 Artifacts. Introduces tape artefacts such as hiss.
- 14 Lo-Fi. Amount of sample rate reduction applied.
- 15 Lo-Fi LED Indicator \*. Change from blue to pink >50% LoFi is applied.
- 16 Bit Depth. Adjusts the amount of bit depth reduction applied.
- 17 Compression. Amount of compression applied
- 18 Compression LED Indicator \*. Light = Blue, Medium = White, Heavy = Pink.
- 19 Compression Ratio \*. Light 3:1, Medium 8:1, Heavy 20:1 - Limiting.
- 20 Duck. CV Modulation input for control of the compressor sidechain.
- 21 Filter CV Input. Modulation input for control of the filter setting.
- 22 Drive CV Input. Modulation input for control of the drive setting.
- 23 LoFi CV Input. Modulation input for control of the LoFi.
- 24 Mag CV Input. Modulation input for control of the mag setting.
- 25 Audio Inputs. Left / Right audio input pair.
- 26 Audio Outputs. Left / Right audio output pair.

\* The brighter the LED, the more effect is applied.



\* The brighter the LED, the more effect is applied.

## INPUT / OUTPUT ASSIGNMENT

CV and Gate can be applied to control four effect parameters plus the compressor duck. These are patched into CLRS from other modules which act as the source for the modulation. There are 2 audio inputs and 2 audio outputs are provided for stereo audio processing.

### CV Inputs

There are 4 Control Voltage inputs located on the lower front panel of CLRS, Filter, Drive, Mag and LoFi. In addition a compressor sidechain input offers the ability to duck the audio. All CV Inputs typically operate using a +/-5V range.

### Audio Inputs

Two, dual mono audio inputs are provided. These would typically be connected from another Eurorack level stereo audio output. For example, patch in from audio sources for example Osiris Bi-Fidelity Wavetable Oscillator.

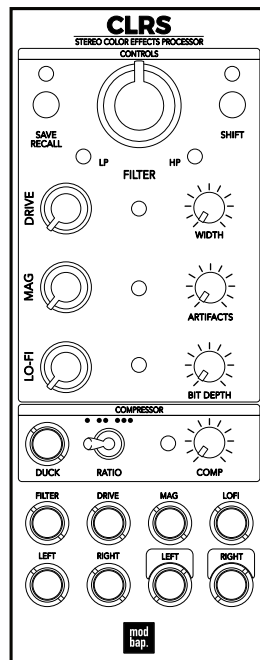
### Audio Outputs

Audio is routed through CTRLS in stereo. Two audio outputs are provided for the processed stereo audio.. The convention is for output connectors to be framed with a white label tag. These would typically be connected to another Eurorack level audio input. For example, patch into destinations for further processing such as Transit 2 Channel Stereo Mixer.

## GETTING STARTED

Follow the quick start walkthrough in order to get things started. This is an example covering the basics of processing beats.

1. To start, set the filter at 12 o'clock, the comp ratio on light (one dot), and all other controls at their minimum settings (all the way counter clockwise). This is the starting point with no effects engaged.



Base State  
No effects applied.

2. Send a signal into the CLRS at a volume that allows plenty of headroom, as the CLRS will boost the signal significantly in this example.
3. Add Drive. Begin by adjusting Drive to about 9 o'clock on the knob position.
4. Set Compression. Turn up the comp knob to about 9 o'clock. This will drive the audio input into the comp and give you a nice boost to the signal with minimal coloration until you drive the signal harder. Notice how this gives you a nice boost with a bit of compression. This is an iterative process so continue to adjust the drive and comp to your liking before adding any other parameters or CLRS effects. Further adjustments can be made later.

5. Now, widen the stereo field by adjusting the width knob to about halfway. Set the knob to 12 o'clock position.
6. Next, let's add mag and artifacts.
  - Set the mag between 9 o'clock and 12 o'clock. This will add saturation.
  - Set the artifacts to 12 o'clock. This will add tape artifacts such as drops, warble, and tape hiss. In stereo mode on the CLRS, the artifacts have a unique effect where the left and right channels are offset, creating a ping pong-like movement that becomes more pronounced as you go beyond minimal settings.
7. Add Color. To add some color, dial in a bit of lo-fi. Set the lo-fi knob to 9 o'clock and dial in to the bit depth knob. Start with the bit depth at 12 o'clock.
8. Tweak the compression. Boost the comp to about 12 o'clock, and you should begin to hear a bit of pumping. If not, switch the ratio to the two dot position to select a medium compressor ratio.
9. Now, let's perform the filter. Tap the shift button. When the LED above shift turns blue, you can adjust the resonance setting of the filter by turning the filter knob. Tap the shift button again to exit the resonance setting. Now, tweak the filter to your liking





# Effects

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## CLRS

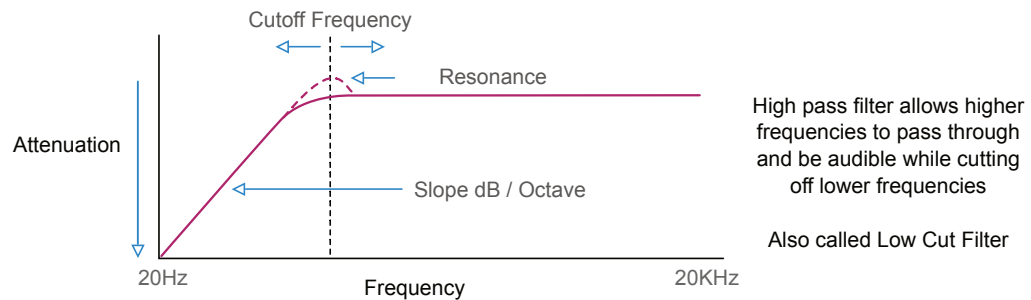
CLRS effects consists of 3 sections. The filter is a DJ-style low-pass and high-pass filter. A large knob allows quick and easy access to the LP and HP cutoff especially useful for live performances and on the fly changes. The series of effects includes the "Drive" distortion followed by "Mag" which brings tape saturation as well classic tape artifacts such as drop outs and hiss for added character. The module also includes the "Lofi" section where the LoFi knob adjusts the sample rate reduction, emulating the characteristics of lower-quality audio recordings or older digital devices along with the mini pot knob controlling the bit depth reduction, introducing quantization noise and distortion for a gritty, distorted, or "bitcrushed" effect. The "Width" knob is a new feature which widens the stereo spread. This combination allows you to control the stereo widening effect of your audio. The final CLRS feature is the one-knob compressor that adds punch and dynamics to your sound with a selectable ratio starting at a gentle setting up to heavy limiting territory. For further control and modulation possibilities, CLRS provides CV inputs for drive, filter, drive, mag, lofi as well as and compressor ducking.

## WHAT IS A FILTER?

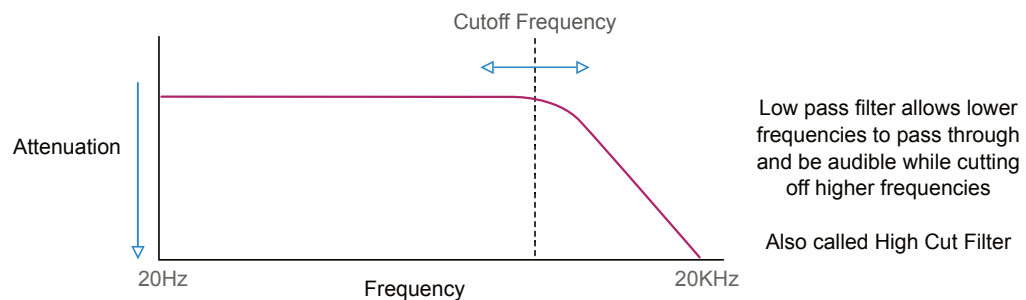
Audio signals are made up of a series of sound waves that travel through air to the listener. These sound waves sit in the frequency range of human hearing and the emphasis on specific frequencies are what contributes to the distinct sound character. Filters are an often used device in modular setups. Filters 'carve out' the frequencies in the sound spectrum which in turn shapes the tone and timbre. As such filters are applied in the audio signal chain to shape the sound and are often modulated to create more interest and movement. The type of filter selected has a major influence on the sound character.

### Anatomy of a Filter.

#### High Pass Filter



#### Low Pass Filter

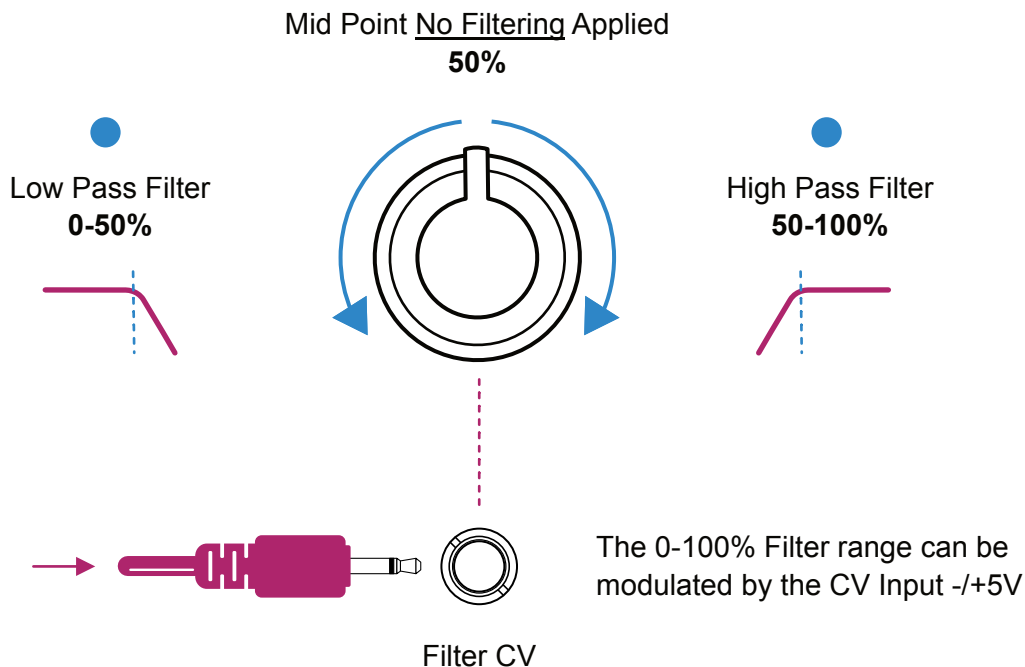


CLRS provides control over the Cutoff Frequency in a DJ Performance style format for HP and LP cutoff. The Slope is fixed. The filter knob controls the range between Low Pass (LP) and High Pass (HP).

## CLRS FILTER

The CLRS filter is an integrated, one knob LP and HP Filter. This is configured in a classic DJ style to encourage and support the filter as a performance rather than sound design feature. The knob is oversized to allow easy access and quick hands on control of the filter cutoff.

### Filter Control



The central mid point of the filter knob will be a neutral position where no filtering is performed of the audio which is passed through fully.

When turning the knob counter-clockwise beyond the mid point, low pass filtering is applied where the higher frequency ranges are gradually attenuates and the low frequency range is passed through.

Turning the knob clockwise beyond the mid point, high pass filtering is applied where the higher frequency ranges are passed through while low frequency ranges are gradually attenuated.

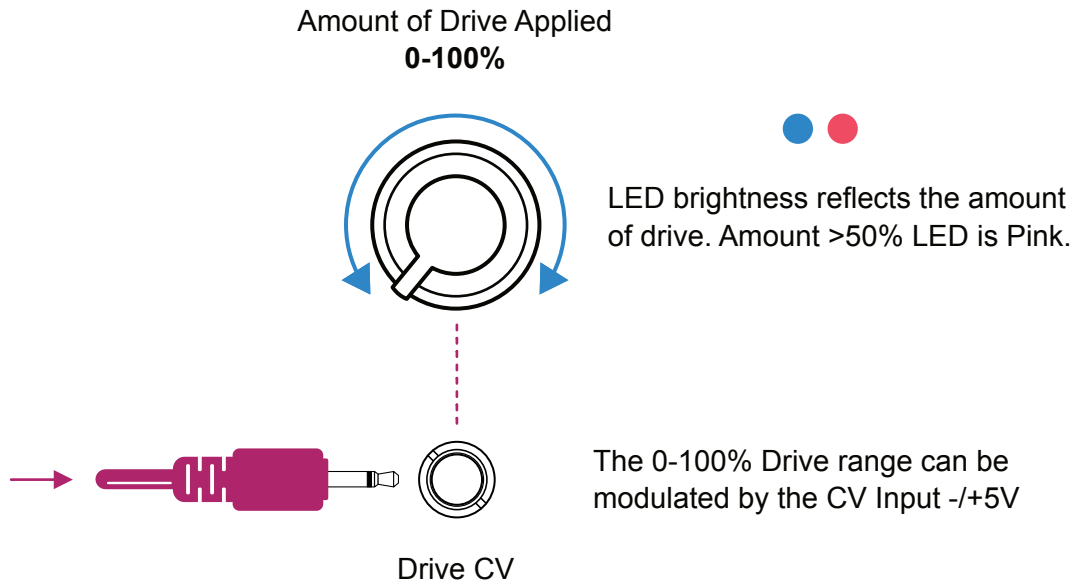
Respective LED indicates state and brightness for the amount of filtering applied.

The use of the filter knob offers interesting creative options especially during a live performance to change the tone and timbre of the incoming audio. Create build ups and drops and add variation especially when modulating the filter cutoff remotely from another device for example an LFO, Envelope or Sequencer.

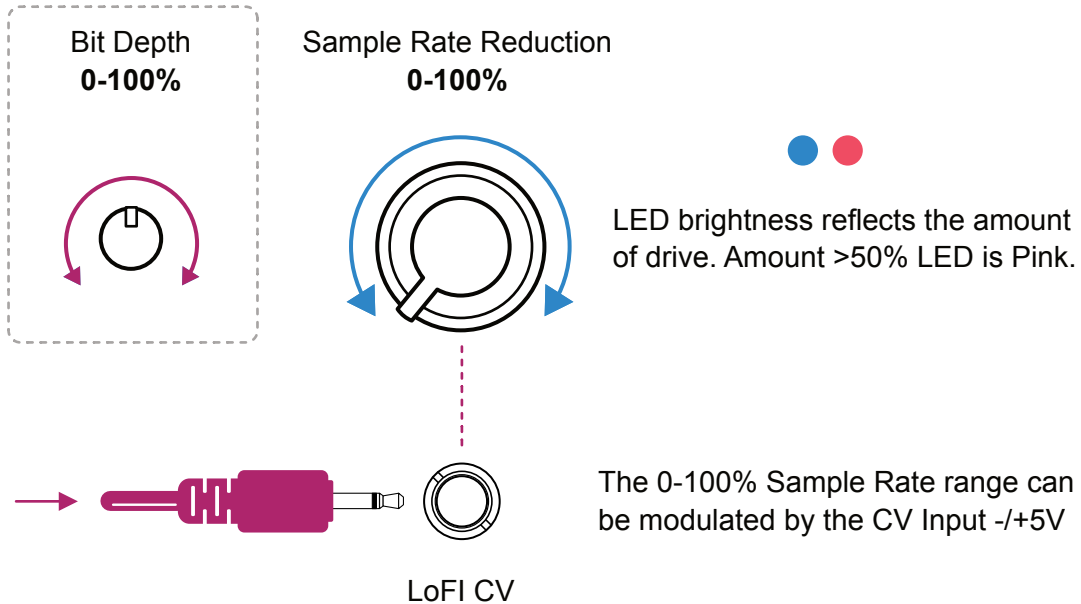
## DRIVE AND LOFI

Drive and LoFi sections adds grit and texture to the stereo audio. Drive boosts and lightly distorts the signal while the LoFi section applies bit rate and sample rate reduction, both controlled separately.

### Drive.



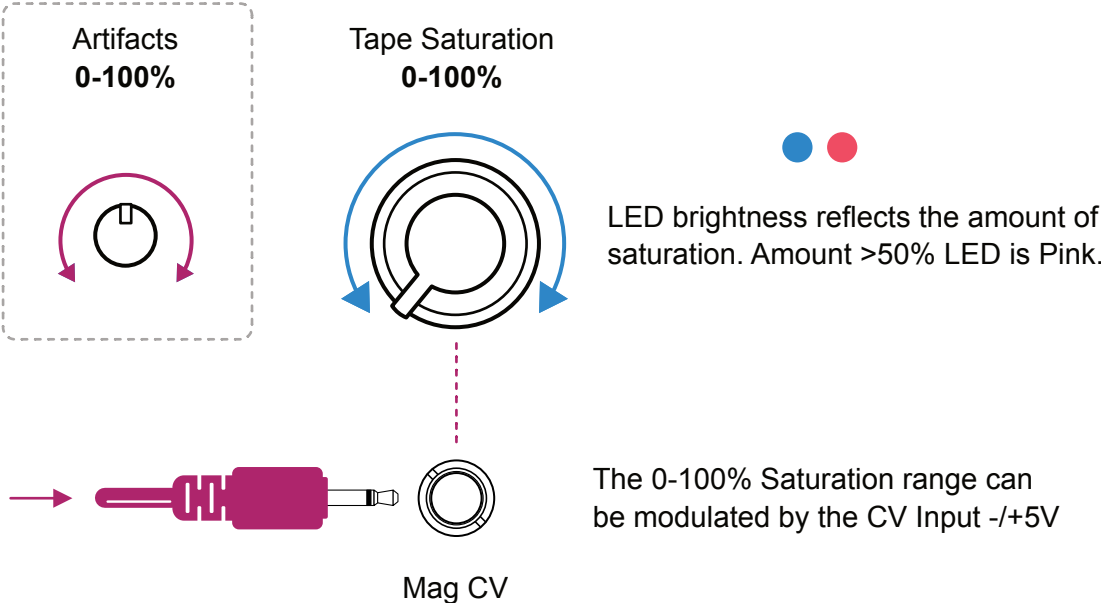
### LoFi



### MAG TAPE SATURATION

Mag is an innovative and unique feature which emulates the characteristics of classic analog tape and cassette devices bringing subtle saturation and tone adjustment to the audio as well as adding artifacts such as hiss and drops.

#### Mag Control

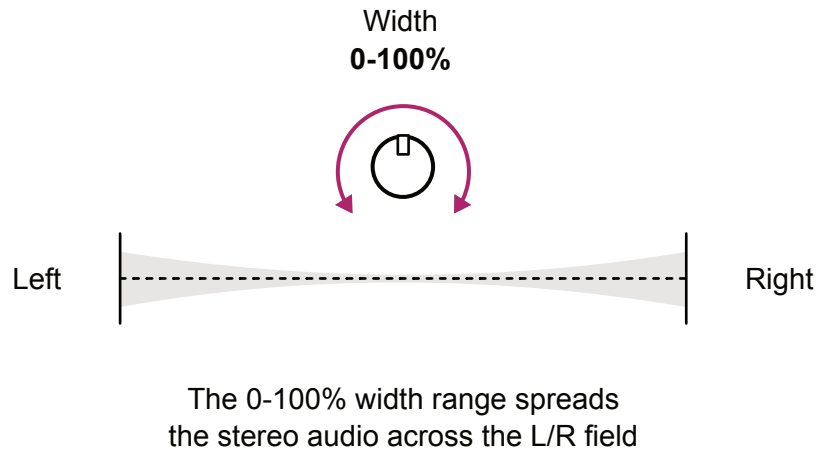


Mag allows you to dial in the warmth, saturation, and subtle distortion and to easily add vintage and analog-style tonal qualities to your audio, bringing depth, richness, and harmonic content to your sound.

## WIDTH

Width allows the affected mix to be spread within the stereo field widening the audio. This is a simple one knob function which quickly widens the audio. There is no CV control or modulation applied nor any LED feedback of the settings. This is only a manual control using the mini pot.

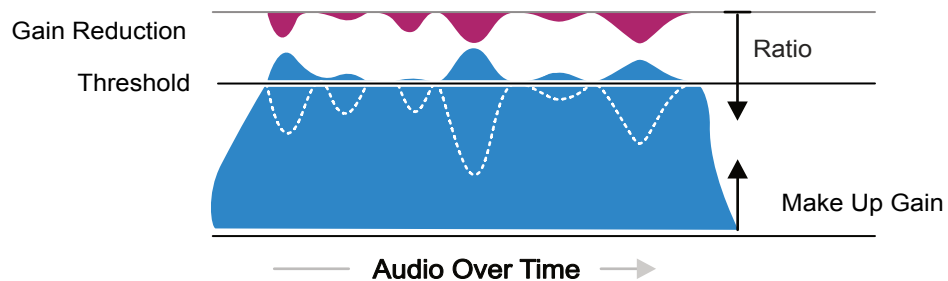
Width Control.



## COMPRESSION

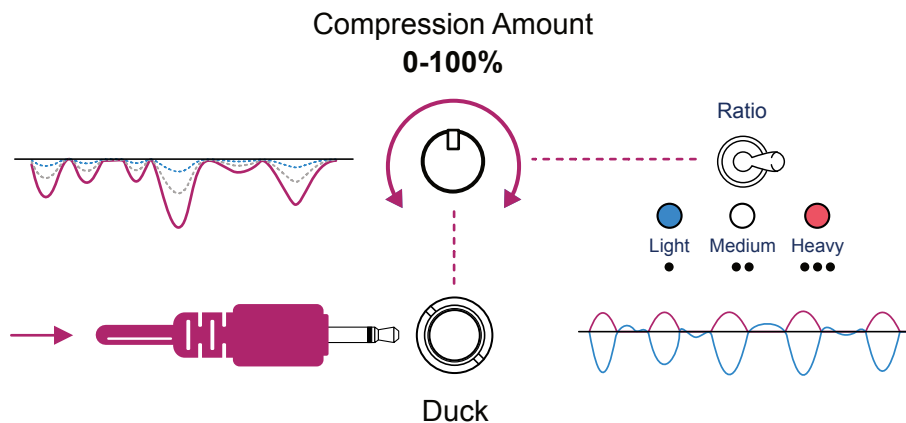
Compression is a common function typically located at or near the end of an audio chain. A compressor is used to tame and control audio peaks and help add punch. A compressor reduces the gain of audio that exceeds a defined threshold by an amount governed by the ratio. This reduces the dynamic range and allows make up gain to be added to adjust the perceived loudness. A sidechain input is sometimes found on a compressor. This can be used creatively for ducking or dipping the audio at intervals controlled by another source. For example a kick drum could be the source to trigger a reduction of the main audio to create space in the mix.

### Typical Compressor



### CLRS Compressor Control

Colors features a one-knob compressor that adds punch and dynamics to your sound. Simply adjust the compressor knob to achieve a more polished and balanced audio output. Additionally, the compressor has a 3 position ratio switch that allows switching between light (3:1), medium (8:1), and heavy (20:1) ratios. Note that ratio's over 12:1 are typically considered limiting. The compressor also includes a duck input for side chain compression.







# System

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## CLRS


CLRS is a Eurorack module contained in a 3U, 10HP form factor. From time to time there will be firmware update releases to add new features, enhancements and fix any unwanted bugs. This section mainly features the process for firmware updates. In addition the details of preset storage and recall are covered within this section where 4 setting states can be saved for future loading within the module.

## SAVING / LOADING SETTINGS

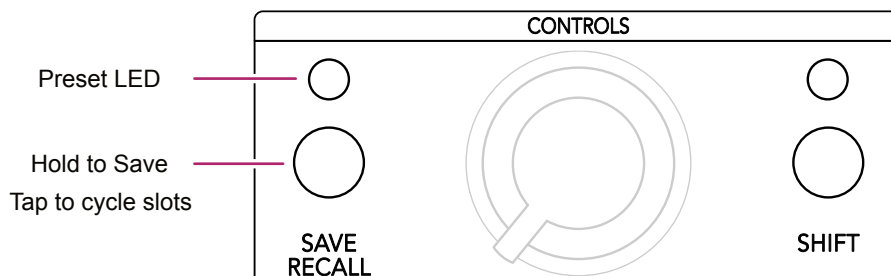
There are 4 save / recall slots available to which a series of CLRS parameter settings can be stored. The current slot will be automatically recalled and parameters restored on power up.

### Saving Settings

1. Tap Save /Recall button once to check the currently active slot. The slots are indicated by the Preset LED Color. The slots assigned are; Slot 1 - Pink, Slot 2 - Blue, Slot 3 - Yellow and Slot 4 - White.
2. Each subsequent tap of the Save button will cycle through each slot selection. Preset slots are just selected at this stage, no preset is loaded.
3. Once the desired slot is selected, Hold the Save button. The current settings are saved to the selected slot.

| Slot | Preset LED   |
|------|--|
| 1    | Pink     |
| 2    | Blue    |
| 3    | Yellow  |
| 4    | White   |

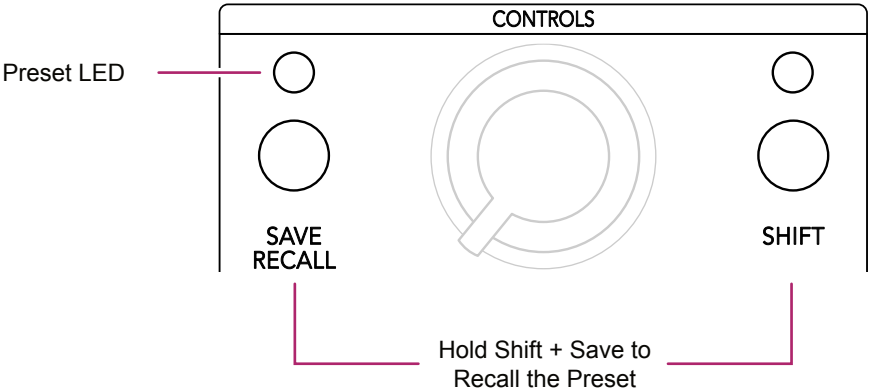
Preset LED will indicate the active and selected save slot when tapping 'Save' button.



### Recalling Settings

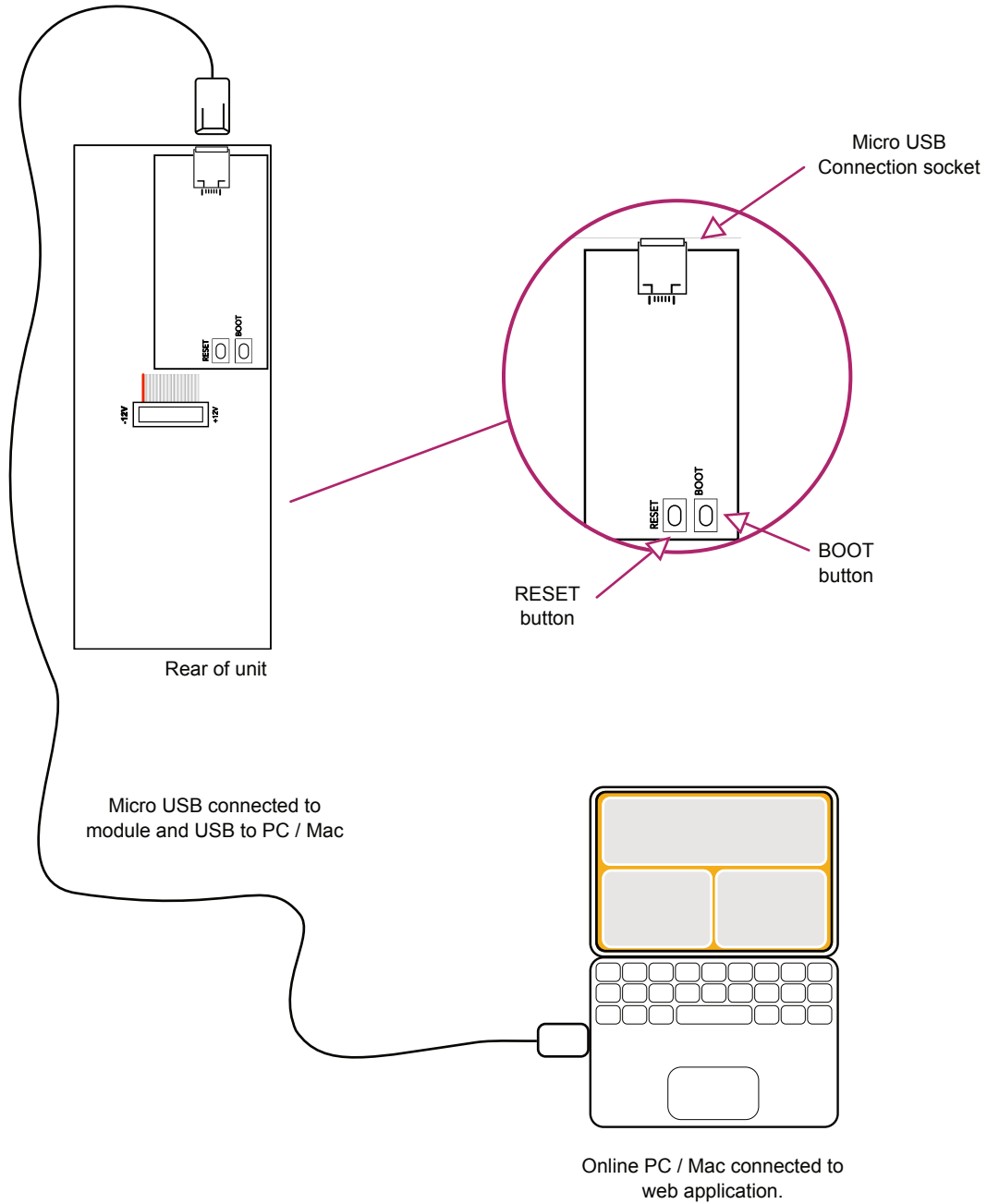
- 1. Tap Save / Recall button once to check the currently active slot. The slots are indicated by the Preset LED Color. The slots assigned are; Slot 1 - Pink, Slot 2 - Blue, Slot 3 - Yellow and Slot 4 - White.
- 2. Each subsequent tap of the Save button will cycle through each slot selection. Preset slots are just selected at this stage, no preset is loaded.
- 3. Once the desired slot is selected, Hold Shift + Tap Save button. The current settings are loaded from the selected slot as active in the device..

Preset LED will indicate the active and selected save slot when tapping 'Save' button.



## FIRMWARE UPDATES

Occasionally firmware updates are available. This may be to provide improvements to the functionality, fix bugs or add new features. Updates are applied using the micro USB connector on the rear of the unit and connecting to a PC or Mac.



## UPDATING THE FIRMWARE - MAC

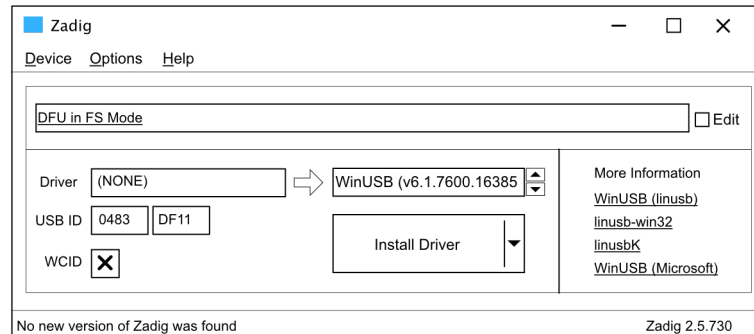
The instructions below are a guide. Always follow the instructions that are provided with each update.

1. Download the firmware update.
2. Remove the device from the rack and ensure power is disconnected.
3. Connect device using a micro usb connection to the module and USB to a mac. The module LED will illuminate. Power for the programming function is provided by the USB connection to the Mac.
4. Open the programming utility at [electro-smith github](#) within the Mac browser. It is recommended to use Chrome browser.
5. On the module, firstly hold the boot button and then press the reset button. The module will enter boot mode and the LED may appear slightly brighter.
6. On the programming page, press 'Connect'.
7. The option pop up box will open and select 'DFU in FS Mode'.
8. Click the bottom left option to select a file using the browser. Select the .bin firmware update file from the Mac.
9. Click 'program' in the bottom programming section window. The status bar indicators will show erase status followed by upload status.
10. When complete disconnect the usb connection and reinstall into the rack.
11. Power on the rack and module.

## UPDATING THE FIRMWARE - PC WINDOWS

The instructions below are a guide, follow the instructions provided with each update.

1. Windows PC's may need the original WinUSB drivers installed. It is recommended to install Zadig, a utility which reinstalls windows drivers, before updating. This can be downloaded from [www.zadig.akeo.ie](http://www.zadig.akeo.ie).



1. Download the firmware update.
2. Remove the device from the rack and ensure power is disconnected.
3. Connect device using a micro usb connection to the module and USB to a PC. The module LED will illuminate. Power for the programming function is provided by the USB connection to the PC.
4. Open the programming utility at [electro-smith github](https://github.com/electro-smith) within the PC browser. It is recommended to use Chrome browser.
5. On the module, firstly hold the boot button and then press the reset button. The module will enter boot mode and the LED may appear slightly brighter.
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8. Click the bottom left option to select a file using the browser. Select the .bin firmware update file from the PC.
9. Click 'program' in the bottom programming section window. The status bar indicators will show erase status followed by upload status.
10. When complete disconnect the usb connection and reinstall into the rack.
11. Power on the rack and module.

## TIPS WHEN UPDATING THE FIRMWARE

There are several things to consider when updating the firmware from a PC or Mac. These tips will help to avoid any problems when updating.

1. PC users may need WinUSB driver installed to use the electro-smith utility. A PC application called Zadig may help install generic windows drivers. This is available from [www.zadig.akeo.ie](http://www.zadig.akeo.ie).
2. Ensure the USB is the correct type for data use. Some devices such as mobile phones are supplied with a Micro USB cable for charging purposes. The USB cable needs to be a fully featured USB cable. Any connected device may not be recognised by the web app if the cable is incompatible.
3. Use a browser that is compatible with running scripts. Chrome is a robust browser recommended for this purposes. Safari and Explorer are less reliable for script based web applications.
4. Ensure the PC or Mac USB supply power. Most modern devices have USB powered but some older PC/Mac's may not supply power. Use a USB connection that can supply power to Per4mer.



## Limited Warranty

Modbap Modular warrants all products to be free of manufacturing defects related to materials and/or construction for a period of one (1) year following the product's purchase date by the original owner as certified by proof of purchase (i.e. receipt or invoice).

This non-transferrable warranty does not cover any damage caused by misuse of the product, or any unauthorized modification of the product's hardware or firmware.

Modbap Modular reserves the right to determine what qualifies as misuse at their discretion and may include but is not limited to damage to the product caused by 3rd party related issues, negligence, modifications, improper handling, exposure to extreme temperatures, moisture, and excessive force.



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Manual Version 1.0 - May 2024

(Firmware Version 1.0)

Manual designed by Synthdawg

[www.synthdawg.com](http://www.synthdawg.com)





BUILT FOR EURORACK  
DOPE ENOUGH FOR BOOMBAP!

Firmware  
V1.0



[www.modbap.com](http://www.modbap.com)