
BODY OF LIGHT

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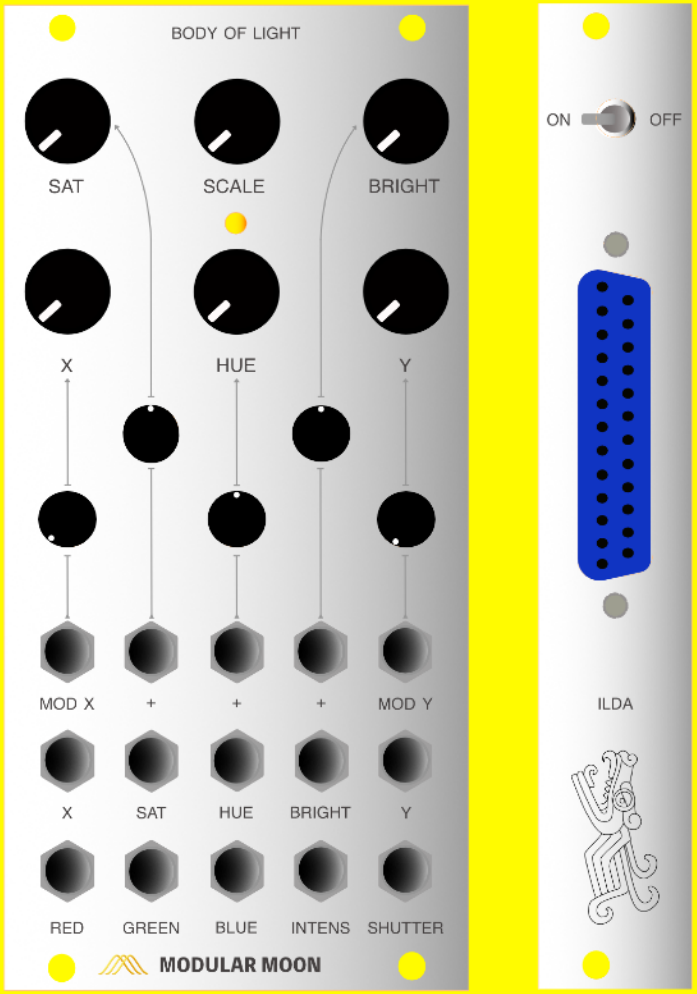
QUETZALCOATL EDITION

INSTRUCTION MANUAL


BODY OF LIGHT
SAT
SCALE
BRIGHT
X
HUE
Y
MOD X
+
+
+
MOD Y
X
SAT
HUE
BRIGHT
Y
RED
GREEN
BLUE
INTENS
SHUTTER
MODULAR MOON
ON
OFF
ILDA

Introduction

Modular Moon – Body of Light (Quetzalcoatl Edition)

Eurorack Laser & Light Control Module

The **Body of Light** is a unique Eurorack module designed to bridge the gap between modular synthesis and laser visuals. Engineered for artists working with light, sound, and motion, this module transforms **control voltage (CV), audio signals, and modulation sources** into dynamic laser projections and color manipulations.

Inspired by the mythical **Quetzalcoatl**, the feathered serpent god representing light and wisdom, this edition features a **dragon emblem facing upwards**, symbolizing **ascension, creativity, and energy flow**—an homage to both ancient mythology and modern audiovisual expression.

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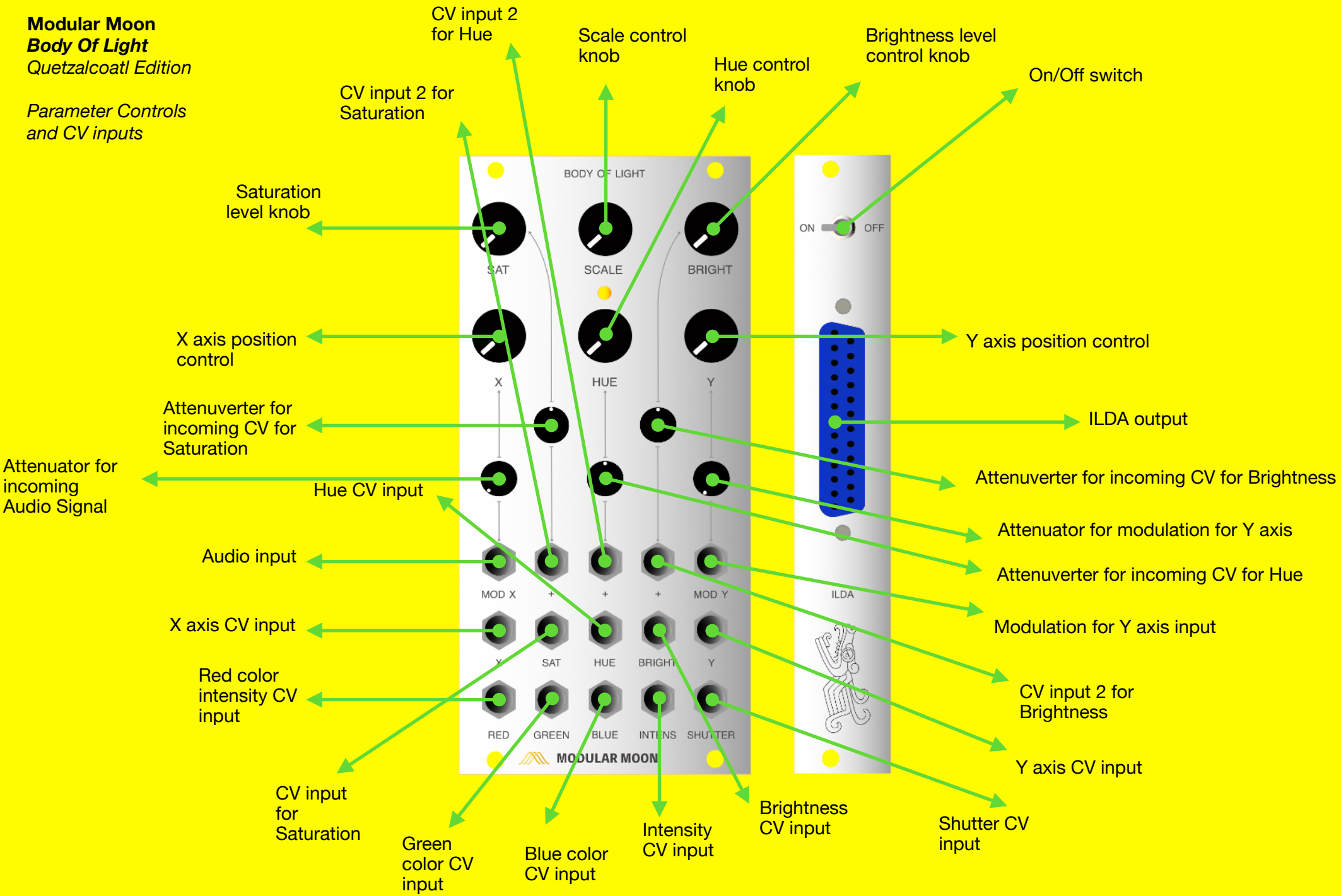
Parameter Controls and CV inputs



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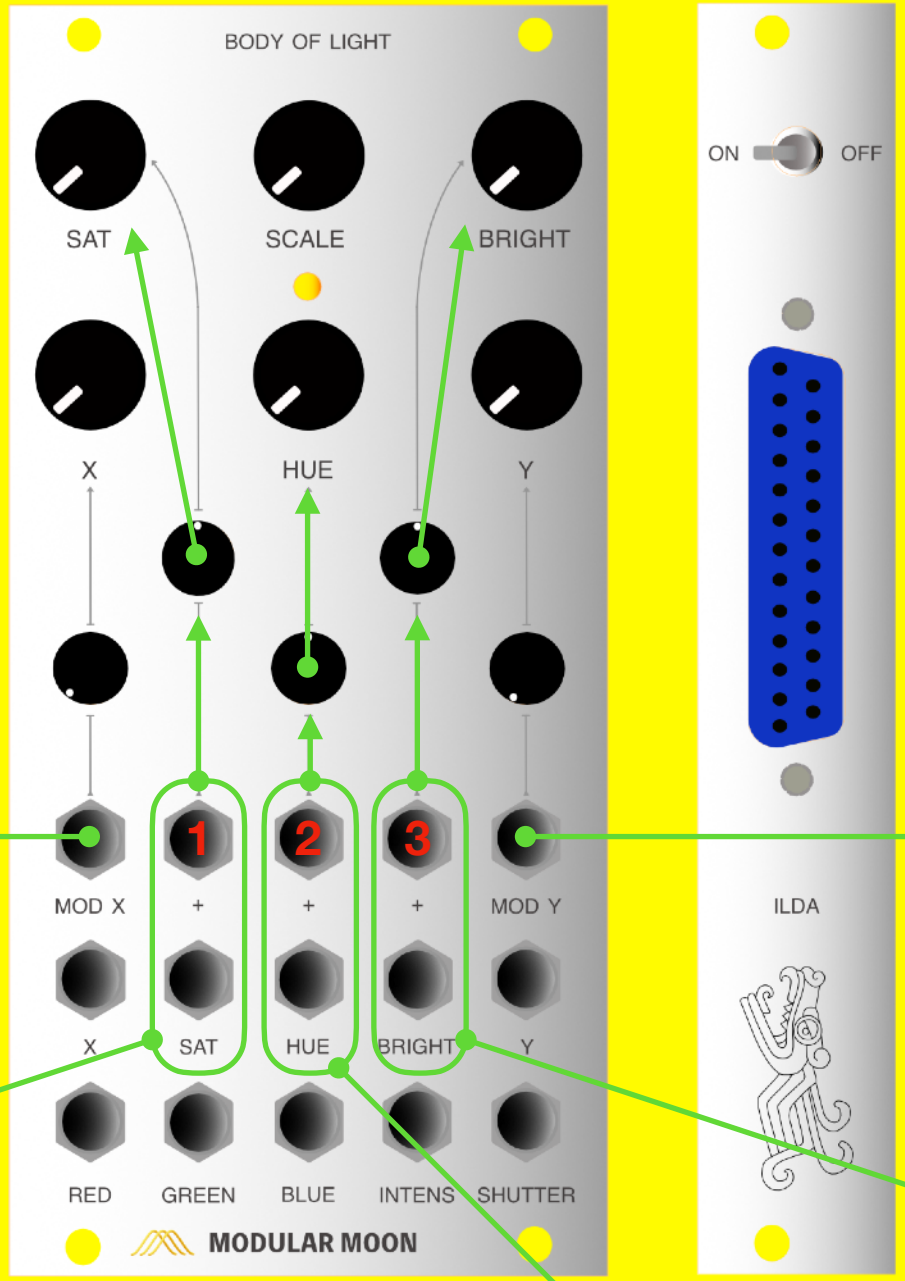
Additional Features



Mod X input receives audio signals. This input has envelope follower that is passed forward to the next inputs on the right (input 1, 2 and 3) and mod Y automatically. CV inputs 1, 2, 3 and Mod X and Y all have an envelope follower after the input, and the attenuverters/attenuators above set the level of modulation. These levels are then summed with the corresponding DC coupled CV inputs below, and the value of the potmeter, which works as an offset. Attenuverters above control the level of modulation passed on Saturation, Hue and Brightness parameters. When feeding CV signal to SAT / HUE / BRIGHT inputs below, the CV is summed together with envelope followers received from Mod X input. However, if to send other CV signal to inputs 1,2 or 3, new signal will override the envelope.

Mod Y input receives audio signal and modulates Y axis of the laser.

CV Sum up for Saturation

CV Sum up for Hue

CV Sum up for Brightness

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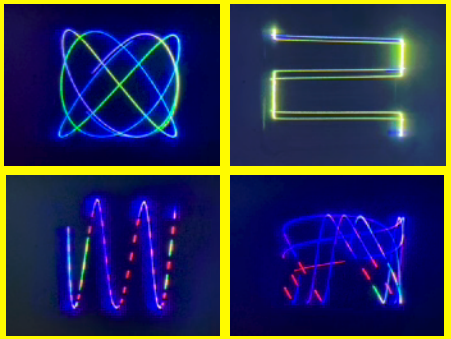
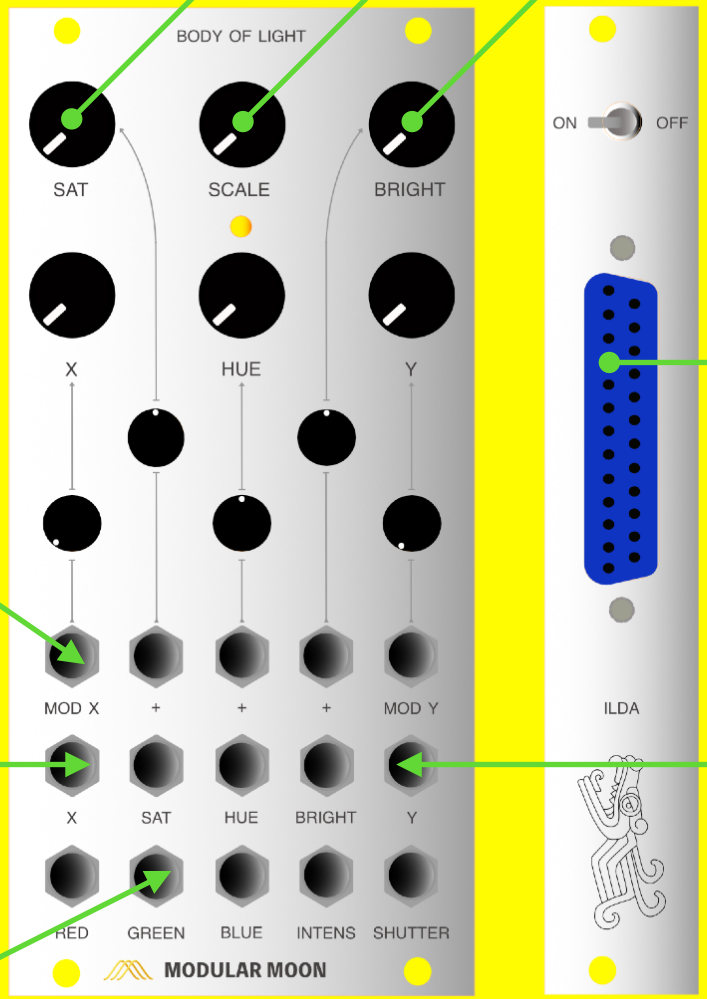
First Patch



Set Saturation to your liking

Scale the Light Body

Set Brightness to your liking



Send Audio Output to Mod X input to sync laser with your music.

AUDIO OUT

Send Sine waveform to X axis. Play with Frequency of the oscillator. Change waveforms for experiment.

VCO SIN

Send any waveform to any of the colors input, or all of them.

LFO

LASER

Connect the module to the laser via ILDA connection.

VCO SIN

Send Sine waveform to Y axis. Play with Frequency of the oscillator. Change waveforms for experiment.

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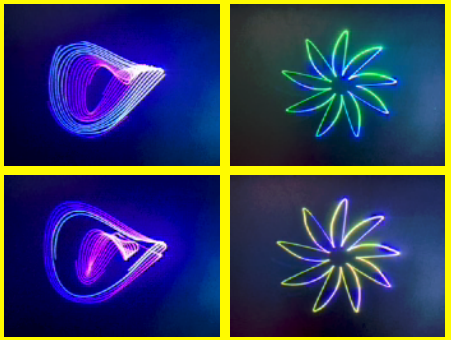
Patch with 1010Music Laser Box

Set Saturation to your liking

Scale the Light Body

Set Brightness to your liking



Send Audio Output to Mod X input to sync laser with your music.

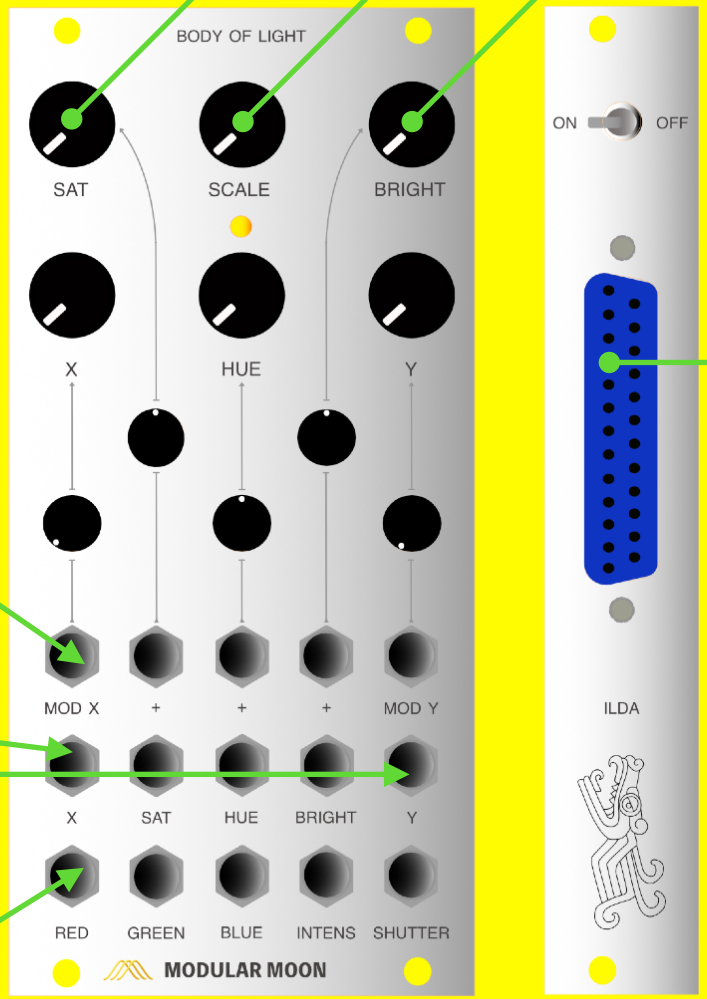
AUDIO OUT

Send Outputs 3 and 4 to X and Y axis. Play with internal parameters of the Laser Box.

1010music Laser Box Outputs 3,4

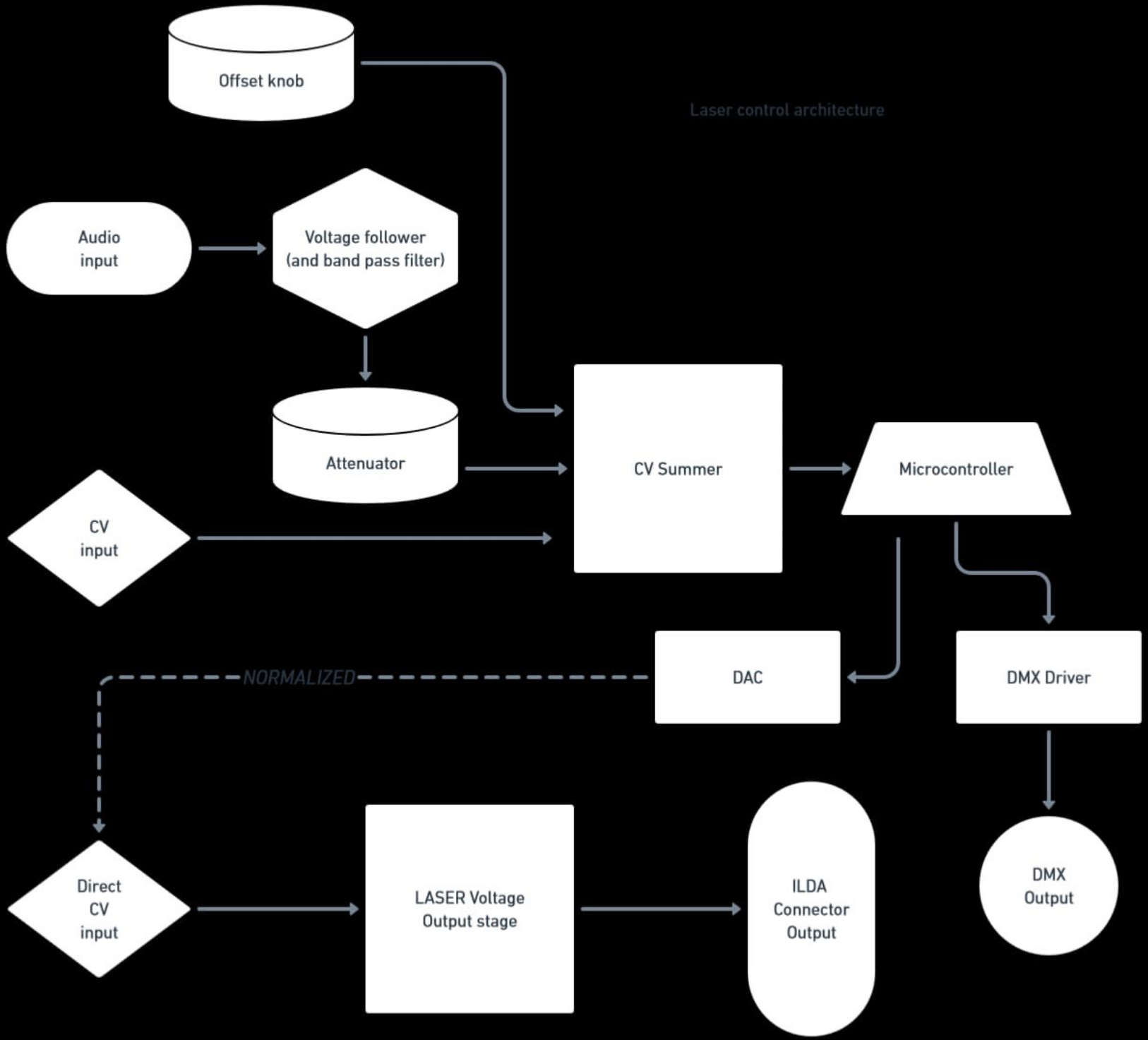
Send any waveform to any of the colors input, or all of them.

LFO



LASER

Connect the module to the laser via ILDA connection.


Laser control architecture
Offset knob
Audio input
Voltage follower (and band pass filter)
Attenuator
CV input
CV Summer
Microcontroller
DAC
DMX Driver
NORMALIZED
Direct CV input
LASER Voltage Output stage
ILDA Connector Output
DMX Output

Module Overview & Controls

Core Functions:

- X & Y Axis Positioning
- Define the spatial movement of the laser using dedicated CV inputs and manual position knobs.
- Use external CV sources such as LFOs or sequencers for dynamic motion effects.
- Color Modulation (Red, Green, Blue, Saturation, Hue): The CV inputs and Knob positions are summed together to determine the values for Hue, Saturation, and Brightness. These values are then read by a microcontroller, and used to calculate the correct values for Red, Green and Blue. The microcontroller uses a DAC to output these values as analog voltages between 0 and 5V that the laser protocol requires. These voltages are normalized to the bottom row of CV inputs: Red, Green Blue, Intens. These inputs are wired directly to the laser, and allows you to bypass the microcontroller and control the color channels directly. If you wish to work in HSB then you can leave the bottom row unpatched.
- Independent CV inputs allow you to mix laser colors dynamically.
- Modulate Hue and Saturation with CV sources for shifting color tones.
- Brightness & Intensity Control
- Control the overall luminosity using either manual knobs or incoming CV.

- Adjust intensity modulation to create pulsating or flashing effects. The intensity switch at the back of the module allows you to send either the analog CV signal directly or the digitally calculated signal (default) to the laser.
- Audio Reactive Mode
- Use an audio input to drive laser movement, brightness, or color shifts.
- Patch a drum beat or synth lead to create sound-responsive visuals.
- Shutter Control
- A dedicated Shutter CV input allows external gating of the laser beam (only if supported by your laser).
- Ideal for rhythmic on/off laser strobe effects.

Connections & Outputs

- ILDA Output: the module transforms all signals in the correct voltages as required by the ILDA standard. For X and Y this is a bipolar differential signal of 10 VPP, and for the other parameters this is a 5 VPP differential voltage. The X and Y have a 6dB low pass filter at 1.5 kHz.
- Standard DB-25 ILDA connector to interface with laser projectors.
- Ensures high-quality visual output with professional laser equipment.

- Multiple CV Inputs
- Accepts up to five control voltage sources for dynamic modulation.
- Compatible with LFOs, sequencers, envelopes, and external modulators.
- Dual Modulation Paths
- Separate attenuators for hue, brightness, saturation, and spatial movement.
- Allows precise control over each parameter.

FOR DMX OUTPUT CONTACT US DIRECTLY TO REQUEST THE UNIT. FIRST EDITION ONLY HAS ILDA OUTPUT HOWEVER DMX IS POSSIBLE TO ADD AS EXTENSION UNIT IN 1 U FORMAT. ALTERNATIVELY YOU CAN INTEGRATE DMX OUTPUT INTO THE ENCLOSURE SIDE PANELS.

Upload firmware

Download the firmware file from the website. Remove the module from the case, to access the backside, but keep the power cable plugged in. Attach the USB-C cable to the module. Power up the case. Hold the boot button down, keep the holding down while:

1. Press the reset button once

2. Plug in the USB cable to your computers USB port
3. Wait a few seconds
4. Hard Disk should appear in the list of drivers
5. Let go the boot button
6. Drag the firmware file into the RP2040 Drive
7. Eject and Remove cable
8. Press reset button to reload the module
9. Patch the module and test the parameters functioning.

Patching Examples & Setup Recommendations

1. Basic Laser Control (Manual Mode)

If you’re new to laser modulation, start with a manual patch:

- X Axis CV Input → Manually adjust the X axis knob to move the laser horizontally.
- Y Axis CV Input → Use the Y axis knob to move the laser vertically.
- Brightness & Saturation Knobs → Adjust laser brightness and color intensity by hand.
- ILDA Output → Connect the module to your laser projector.

This setup allows you to get a feel for the laser's movement and color behavior before introducing modulation.

2. Dynamic Laser Movement (LFO Modulation)

To create sweeping laser motion, try this patch:

- X Axis CV Input → Patch a slow sine wave LFO to create horizontal oscillation.
- Y Axis CV Input → Patch a triangle wave LFO for vertical modulation.
- Brightness CV Input → Use an envelope generator to create pulsing brightness effects.

With this setup, the laser moves smoothly in a circular motion, creating dynamic visuals.

3. Sound-Responsive Laser Effects

For an audio-reactive experience, connect your modular synth's output:

- Audio Input → Patch a kick drum or synth bass to modulate laser behavior.
- Hue CV Input → Patch a snare or hi-hat signal to shift color dynamically.
- Brightness CV Input → Use a CV envelope from your synth to create a light-pulsing effect.

4. Rhythmic Strobe & Shutter Effects

If you want strobe-like effects, use a clock signal:

- Shutter CV Input → Patch a gate signal from a sequencer.
- Brightness CV Input → Use a stepped CV pattern to create rhythmic intensity changes.

This setup allows you to sync laser flashes with your beats for a club-like strobing effect. Check laser's possibilities for strobe - not all lasers provide access to the intensity.

Safety Guide for Modular Moon – Body of Light and Laser Use

1. Understanding Laser Safety

Lasers are classified based on their power output and potential risks. Most professional laser projectors operate within Class 3B or Class 4, which means they can cause eye and skin injuries if not used properly. It is crucial to follow safety protocols to prevent accidental exposure.

Laser Safety Classes

- Class 1 & 2: Low-power lasers, generally safe under normal conditions.
- Class 3R & 3B: Medium-power lasers that can cause eye damage if viewed directly.
- Class 4: High-power lasers capable of causing severe eye and skin injuries, as well as potential fire hazards.

🚨 Warning: If you are using an external ILDA-compatible laser projector, check its classification and handle it with extreme caution.

2. General Safety Guidelines for Laser Use

✅ DO:

✔ Use lasers in a controlled environment (e.g., clubs, stages, or installations with safety measures).

✔ Follow local regulations regarding laser operation, including permits and venue restrictions.

✔ Use laser projectors with built-in safety features (such as key-lock switches, emergency stop buttons, and scan fail protection).

✔ Ensure proper alignment of the laser beam to avoid accidental exposure to performers or the audience.

✔ Install warning signs in areas where lasers are in use.

✔ Use appropriate protective eyewear if working directly with high-power lasers.

❌ DON’T:

❌ Point lasers directly at people, animals, or reflective surfaces that can redirect beams unpredictably.

❌ Operate lasers without supervision or leave them running unattended.

❌ Use outdoor lasers without approval, as they can interfere with aviation and public safety.

❌ Modify or bypass safety features on your laser projector.

❌ Ignore power and beam intensity settings when adjusting laser output.

3. Safe Operation of the Body of Light Module

While the Body of Light module itself does not emit lasers, it serves as a controller for external laser projectors. Safe operation involves both correct use of the module and precautions for the connected laser system.

Module Safety Checklist:

✅ Power Supply: Ensure the module is connected to a stable Eurorack power source before turning on.

✅ CV Control Limits: Start with low CV values to prevent sudden, high-intensity laser output.

✅ ILDA Connection: Use high-quality cables and securely connect the ILDA output to your laser projector.

✅ Shutter Control: Assign a dedicated CV control for the shutter to immediately block the laser if needed.

✅ Brightness and Positioning: Always test laser movement at low brightness before increasing intensity.

4. Venue and Audience Safety Measures

Safe Laser Projection Areas:

- Above the audience (at least 3 meters high) or within controlled zones.
- Away from reflective surfaces, including mirrors, glass, and polished metal.
- Directed towards non-flammable, non-reflective surfaces such as walls or projection screens.

Emergency Preparedness:

🚨 Keep a laser emergency shutdown switch within reach.

🚨 Train event staff to respond to laser-related incidents.

🚨 Be aware of local safety regulations and obtain necessary permits for public performances.

5. Legal and Regulatory Compliance

Many countries have strict laws on laser use. Before performing, check:

✔ EU and U.S. laser safety regulations (e.g., IEC 60825, FDA/CDRH regulations).
✔ Event and venue permits required for laser shows.
✔Licensing for high-power laser operation.

Legal Consequences of Misuse

🚨 Unauthorized laser use can result in fines, equipment confiscation, or legal actions.
🚨 Pointing lasers at aircraft or public spaces is illegal and highly dangerous.

6. Summary: Laser Safety Best Practices

✅ Use lasers responsibly and follow classification guidelines.
✅ Ensure the Body of Light module is correctly set up to prevent accidental laser activation.
✅ Align and test beams carefully before full-intensity use.
✅ Follow legal requirements and venue-specific safety measures.
✅ Have an emergency shutdown plan in case of malfunction.

While Modular Moon took great care to create a safe product, that it is not liable for equipment damage, remember that you are using It at your own risk. Be mindful and caring, aware of your steps and take a good care of the your and other's safety.

Final Note

The Modular Moon – Body of Light is a powerful creative tool, bridging modular synthesis with laser visuals. By following proper safety protocols, you can explore stunning light performances while ensuring a safe environment for yourself and your audience.

🔗 For more information, visit:

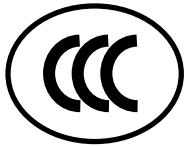
https://www.modularmoon.com/live-performer-series/body-of-light

Contact

Contact us for questions:

info@modularmoon.com

🚀 **Stay safe and let the light guide your creativity!** ✨



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