Version 1.3

User Manual

Optic Portable Laser Cutter

Copyright © 2024 Rendyr, Inc.

Meet Optic — the first portable laser cutting and engraving solution with integrated filtration and infinite work area capabilities. Work with hundreds of materials and enjoy the ultimate flexibility to bring your ideas to life.

Introduction

Welcome and congratulations on starting your journey with the Optic Portable Laser Cutter!

We are excited to see what ideas you will turn into reality with your Optic, and we are here to help you successfully and **safely** use this laser cutter and engraver.

Our team developed Optic's User Manual to walk you through the essential steps from Unboxing to Software and your First Project, the "Hello World" Benchmark, to Product Care. However, the very first step before you start up your Optic is Safety. Laser cutting technology is incredibly useful, but poses serious hazards if not used properly. **No matter whether you are new to lasers or very experienced, we need every user to carefully read the important, Optic-specific safety instructions and follow them every time.**

After this walkthrough, you will be well equipped to run your own projects. Still, there's more! We will share tips and tricks on laser cutting and engraving, project tutorials, and more through our email newsletter, website, YouTube, and social media channels.

Lastly, please contact us at hello@rendyr.com if you have any questions or concerns. We would also appreciate your feedback on this user manual and other resources so we can make improvements in the future.

Thank you for choosing the Optic Portable Laser Cutter for your creative projects.

Safety

With great power comes great responsibility. That's why we created this Safety chapter and our laser safety training materials. These mandatory resources prepare you to safely operate the Optic Portable Laser Cutter, including its integrated filtration system.

Deviation from the prescribed use, or neglecting the operational instructions and safety guidelines in this manual, could potentially lead to serious injury or even death in addition to equipment damage or harm to the nearby environment. Always adhere to all instructions when operating, cleaning, or handling the products detailed in this manual.

© 2024 Rendyr, Inc.

1. General Safety

- Prior to operating your Optic Portable Laser Cutter, carefully read this manual and ensure all other users do the same.
- Laser devices are subject to various local, state, or federal regulations and standards, especially in educational or workplace settings. It is your responsibility to comply with all relevant regulations.
- Never use Rendyr's products while under the influence of alcohol or drugs.
- Never allow minors to operate the laser.
- Never attempt to service, repair, or modify the Optic Portable Laser Cutter device, any of its parts, or the Filter. Modifying your Optic can impair performance, cause defects, and make it unsafe to operate. Modifications will also void your warranty. We've designed components, such as the Laser Module, Laser Viewing Window, and Cutting Mat as "drop-in" replacements that you would perform as the owner in the same way as during standard use. However, if any service or repair should be required, please contact us directly at hello@rendyr.com for assistance.

- Inspect your Optic Portable Laser Cutter for damage before every use. If you find any damage, do not use your device and contact our support team at hello@rendyr.com.
- In the event of an emergency, immediately unplug the power supply from the wall, if it is safe to do so.
- Always place and operate the Optic Portable Laser Cutter on a flat, horizontal, and sturdy surface.
- Avoid creating a tripping hazard through the power supply and any cables.
- Avoid pinch hazards while handling or operating the machine.
- Never modify the work area setup or touch any moving parts while the Optic Portable Laser Cutter is running a job.

- Caution: The Laser Module and other parts or materials in the machine may become hot during operation and require time to cool before they are safe to touch.

2. Electrical Safety

There is a risk of electric shock or fire if the stated safety guidelines are not followed:

- Do not try to access or modify the internal wiring of the Optic.
- Do not open the power supply, laser module, or any other sealed electrical enclosure.
- The power supply and cord are intended to function as a disconnect device. Make sure you can quickly unplug the power supply or power cord if needed.
- Make sure the electrical circuit you connect the Optic's power supply to has a rating of at least 15 amps and complies with local building and electrical codes.

 © 2024 Rendyr, Inc.

3. Laser Safety

The Optic Portable Laser Cutter is a Class 4 laser product. The laser produces high power visible blue light (450-455nm) which is powerful enough to instantly cause skin and eye damage, including permanent blindness. It is also powerful enough to quickly start a fire (more on Fire Safety in the next chapter).

Optic's safety features and properly rated laser eye protection along with all the safety instructions in this user manual and our Laser Safety Officer (LSO) Documents help you understand and control the laser hazards to operate the Optic Portable Laser Cutter safely with confidence.

The Optic has a protective upper housing which blocks laser radiation, and a laser viewing shield which is designed to reduce the amount of scattered laser radiation, and allow viewing of the material and cut while in progress. **However, the laser viewing shield does not replace the requirement for properly rated laser eye protection.**

Laser Eyewear Minimum Requirements:
You will receive one pair of laser eye protection that meets the necessary requirements, but if you choose to use your own laser eye protection or purchase additional glasses for other users, it must meet at least the following requirements:

Rated Wavelength	Optical Density	ANSI Specification
450-455nm	OD 4.5+	ANSI Z136, Z87+

The laser viewing shield frame includes a safety interlock switch, which will immediately disable the laser when the shield is removed. Always keep the laser viewing shield in place during operation. Do not attempt to defeat the safety interlock or place objects near the shield which may interfere with its operation.

Only attach the laser connector to the laser module when it is properly installed and clamped firmly in place on the X-carriage. Never attach the laser connector to the laser module when you are holding the laser module or any other scenario in which the laser module is not properly installed in the Optic.

The Optic utilizes an accelerometer-based tilt sensor which will disable the laser if it detects that the Optic has been tilted beyond a set threshold. This safety feature helps reduce the risk of injury or fire in the event that the Optic is dropped, bumped, or otherwise displaced during operation. The system is designed to allow operation on surfaces which are not perfectly level, however excessively angled work surfaces are not advised. Additionally, using the Optic on a

 © 2024 Rendyr, Inc.

desk which can change height (“Standing” or “Lift” Desks) may cause the sensor to erroneously trip when adjusting the height, and any desk movement during operation is therefore not recommended.

3.1 Class 4 Laser Product Safety Documents

The Optic Portable Laser Cutter is a Class 4 laser product because it processes materials without containing the laser light through a complete enclosure. It complies with Federal Laser Product Performance Standards (FLPPS) 21CFR1040.10 as a Class 4 laser product. In the words of the Center for Devices and Radiological Health (CDRH): *A Class 4 laser product means any laser that does permit human access during normal operation to levels of laser radiation in excess of Class 3B accessible emission limits. A Class 4 laser system is a hazard to the eye or skin from the direct beam, may pose a fire hazard or diffuse reflection hazard, and may also produce laser generated air contaminants (LGACs).*

All Class 4 laser products require a designated Laser Safety Officer (LSO) responsible for ensuring laser safety. We developed these Optic-specific Laser Safety Officer Documents, including a course and templates, with support from laser safety experts at Kentek Corporation to enable you to effectively comply with the LSO responsibilities.

These laser safety measures are mandatory to you as an owner and/or operator and you are required to carefully read and follow these documents in addition to this user manual in order to safely operate your Optic Portable Laser Cutter. **CAUTION: Deviation from these safety measures may expose you and others to laser hazards.**

We provide these Optic-specific Laser Safety Officer Documents for our customers’ convenience and deliver them via email following the purchase of an Optic Portable Laser Cutter.

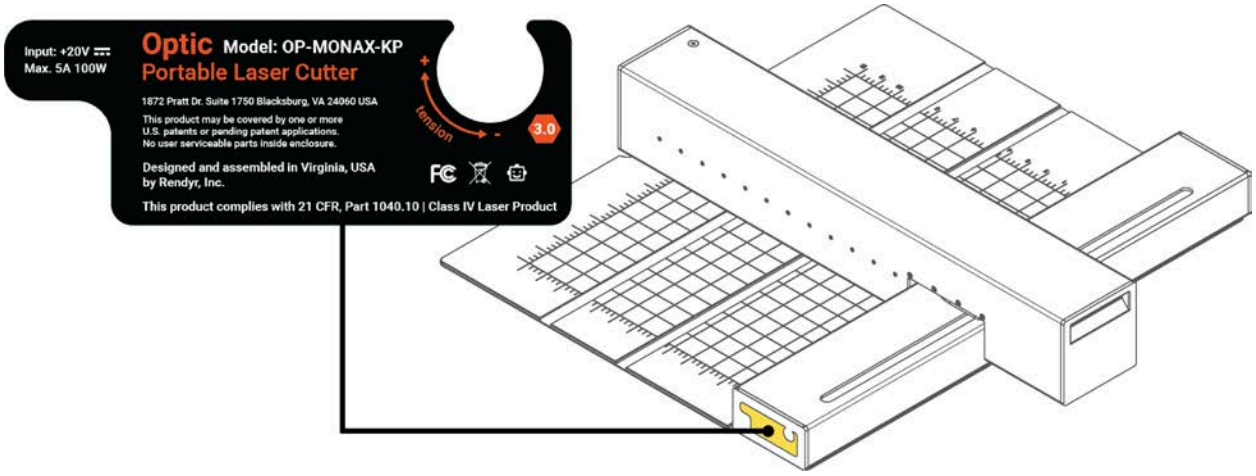
Please contact our support at hello@rendyr.com immediately if you have not received your copy of the Laser Safety Officer (LSO) Documents.

 © 2024 Rendyr, Inc.

4. Laser Safety Labels

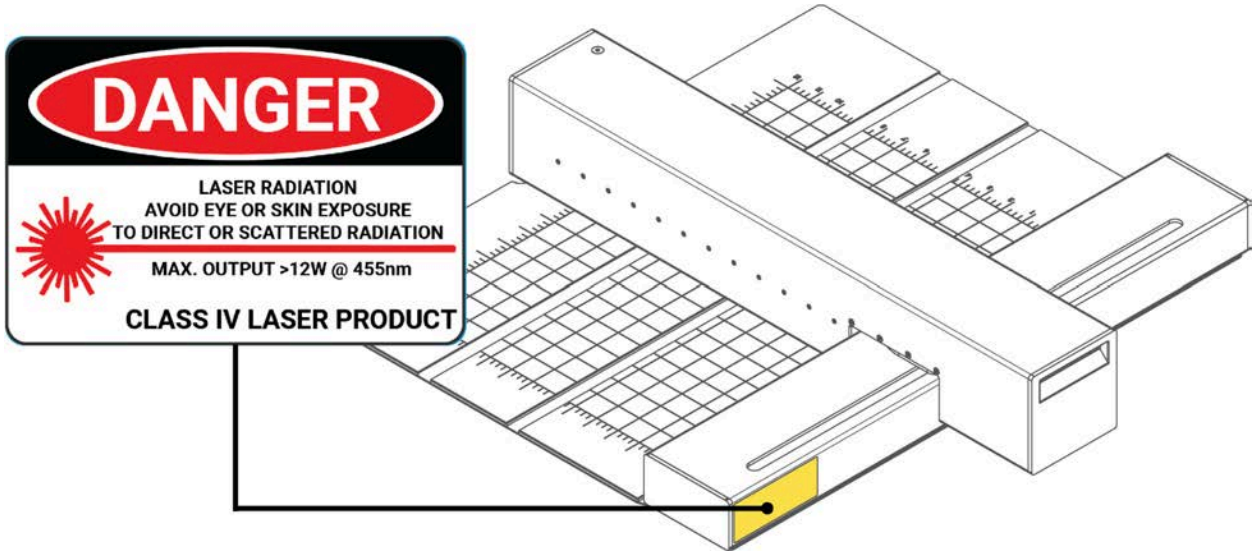
4.1 Product Identification Label

The Product Identification Label shown appears on every Optic Portable Laser Cutter, in the location indicated in the diagram below:



4.2 Class 4 Laser Product Warning Logotype

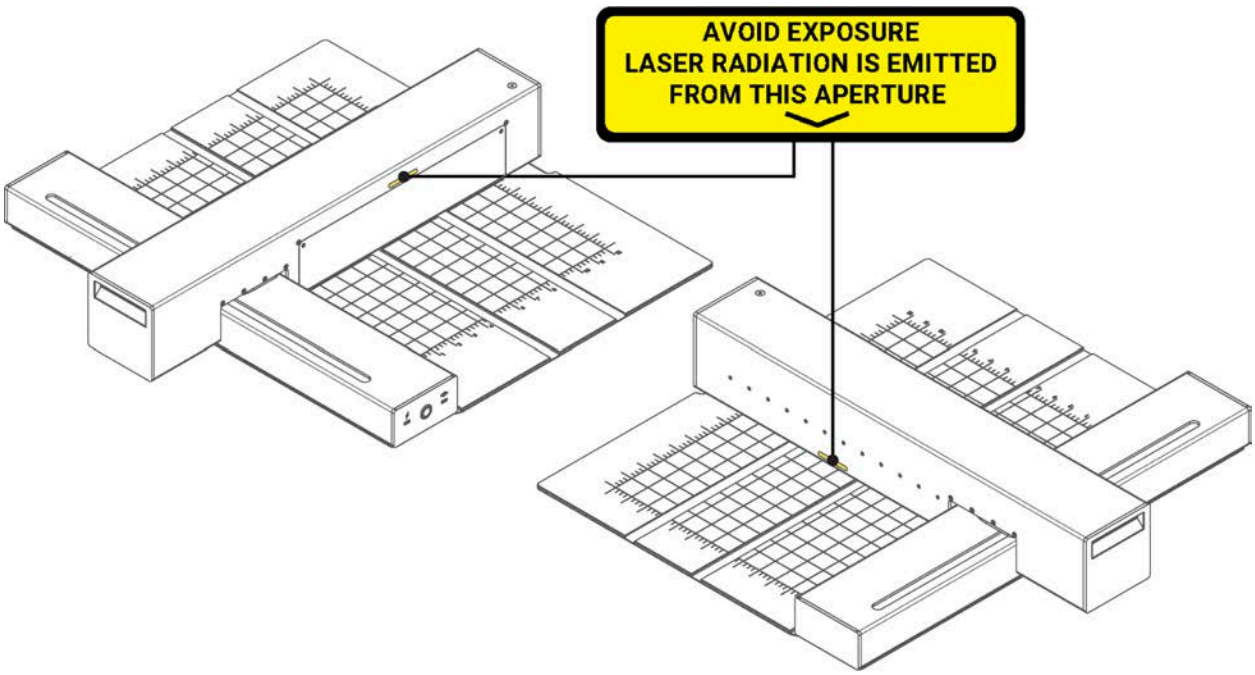
The Warning Logotype shown appears on every Optic in the location indicated in the diagram below:



© 2024 Rendyr, Inc.

4.3 Aperture Label

The Aperture Label appears on the back and front of every Optic, in the locations indicated in the diagram below:



5. Fire Safety

Laser cutting and engraving inherently generates extreme heat, smoke, fumes, dirt, and debris during material processing, which can potentially ignite materials. This poses a serious risk of fire that can spread and damage or destroy your Optic and the surrounding property. While Optic's safety features, such as smoke and fume evacuation and over-temp sensor, reduce the risk, adhering to the following safety protocols at all times is absolutely essential for safe operation.

Before Operation:

- Always keep your Optic's work area and surrounding environment free of debris, clutter, and flammable materials.
- Always keep a properly rated and correctly maintained fire extinguisher in the area.
- Ensure that fire alarms are properly installed and tested in the location of use according to building codes and manufacturer specifications.

© 2024 Rendyr, Inc.

- Correctly level your Optic's Upper Body and focus the Laser Module before every use (see instructions). Improper leveling can result in an out-of-focus laser beam, increasing the risk of fire.
- Only place the material you intend to process in the work area and ensure it's safe (see Materials Safety).
- Never stack flammable materials. Layering dramatically increases the risk of fire.

During Operation

- Never operate the Optic unattended. No precaution will completely eliminate the risk of fire. Always stay within direct sight to monitor the operation and, if needed, execute emergency procedures (see below).
- It's common for a small, candle-like flame to follow the laser as it processes the material. However, it should always extinguish and never continue independently.
- In case of any other persistent flames:
    - Disconnect the power and data cables from the front of your Optic immediately.
    - If safe, use a wet towel to put out the flame.
    - Alternatively, if safe, use a fire extinguisher.
    - If you cannot safely extinguish the fire or if it spreads beyond the Optic, dial your local emergency number (e.g., 911) and evacuate the premises.
    - Do not use the unit again until you've consulted with Rendyr for service details at hello@rendyr.com.

After Operation

- Allow materials to cool down before removing them to avoid burn injury from handling and ignition through contact with other materials.
- Remove all material and clean off all dirt and debris, especially small bits of cutout material (see section 7. Cleaning and Aftercare for the Optic).

6. Smoke and Fume Safety

6.1 Laser-Generated Contaminants

Laser-generated smoke and fumes are not just a fire risk. Exposure to these air contaminants, including carbon monoxide and other harmful substances, also poses health hazards. The types of contaminants produced during laser cutting and engraving depend on the processed material. For example, wood materials generate more particulate matter (smoke) while plastic materials release more VOCs (fumes).

6.2 Filtration and Exhaust

© 2024 Rendyr, Inc.

Your Optic's integrated filtration system is designed to capture the laser-generated smoke and fumes through HEPA mechanical and high-activity carbon chemical filtration media. It also uses a washable Pre-Filter to capture larger particulates early and preserve the Filter life.

Another available option is the Exhaust Module accessory which functions as a drop-in replacement and controls these byproducts through venting them outside or connecting to external filtration systems.

Never use the Optic Portable Laser Cutter without either the integrated filtration system or Exhaust Module correctly installed. Always ensure they function properly by following these safety guidelines:

Integrated Filtration

- Only use genuine Optic-compatible Pre-Filters and Filters manufactured by Rendyr.
- Ensure the Pre-Filter and the Filter are properly installed.
- The Pre-Filter is washable, but needs to be completely dry before use.
- Never use moist, wet, broken, or otherwise damaged Pre-Filters and Filters.
- Replace the Pre-Filter and Filter when they are saturated (see section 7.6. Replace Optic Filter). Dispose of these in local waste.

Exhaust Module

- Ensure the Exhaust Module is properly installed all the way up to a safe, compliant exhaust location or an external filtration system (see Exhaust Module User Manual).
- If you decide to exhaust outside, choose an exhaust location that does not expose others and ensure that you understand and comply with local laws and ordinances.
- If you decide to connect the exhaust to an external filtration system, confirm that it is compatible, properly rated, and correctly installed to control the laser-generated smoke and fumes.

To ensure complete fume and particulate capture, never shut down the Optic before the fans stop, unless an emergency requires it.

6.3 Additional Smoke and Fume Safety

Materials can continue to offgas independently, even after the laser cutting or engraving completes. It is normal for laser cut items to smell strongly for a while after they are cut.

Always operate in a well-ventilated area with fresh air supply to avoid harmful accumulation of contaminants from off-gassing or other unforeseen circumstances.

 © 2024 Rendyr, Inc.

Ensure that carbon monoxide detectors are properly installed and tested in the location of use according to building codes and manufacturer specifications.

7. Materials Safety

7.1 Inherent Risks in Material Composition

Some materials are not safe to use with a laser cutter due to their inherent chemical composition. For instance, PVC emits toxic chlorine gas when cut, and materials like polycarbonate can catch fire easily.

7.2 Hidden Hazards: Coatings and Additives

Even materials that are typically considered safe for laser cutting, such as acrylic or wood, can become hazardous if they include subtle, often invisible, coatings or additives. For example, some types of acrylic sheets may have flame-retardant coatings, and some types of plywood contain formaldehyde, both of which can release toxic fumes when cut. See the chart below for common hidden hazards. This list is not exhaustive, and you must complete your own research to ensure safety.

Material Name	Hazardous Chemical	Risk	How to identify
Leather, artificial and Leather, chrome tanned	Polyvinyl chloride, PVC, or chromium	Toxic or corrosive fumes	Pleather, or artificial leather is made of PVC. For genuine leather, avoid “chrome tanned” and look for “veg tanned” instead
Fiberglass and carbon fiber	Epoxy resin	Toxic fumes	Most fiberglass and carbon fiber materials contain hazardous epoxies - coatings or adhesives are more likely to be a hazard
Wood, pressure treated	Formaldehyde	Toxic fumes	Look for markings, or a greenish tint. Avoid using unknown lumber.

© 2024 Rendyr, Inc.

7.3 Risks of Processing Unsafe Materials

Processing unsafe materials introduces significant risks, including the potential for fire and the emission of highly hazardous smoke and fumes. Standard ventilation or filtration systems may not be effective in mitigating these risks. Such incidents can not only compromise human health but also cause irreversible damage to your Optic.

7.4 Caution with Reflective Materials

Additional caution is needed for reflective materials, such as some metals. These can reflect the laser beam instead of absorbing it causing harmful direct exposure to laser light and potentially damaging the Optic.

7.5 Safety Precautions and Material Sourcing

To safeguard both human health and the integrity of your Optic, it's crucial to use only materials confirmed to be safe for laser cutting and engraving. Never process materials with unknown properties.

You may have purchased our Material Kit to get started. We have made sure the materials we provide are laser-safe. However, when sourcing materials from other suppliers, look out for materials that are marked as safe for processing with laser cutters or inquire directly with the supplier to ensure that you can safely use the material with your Optic.

 © 2024 Rendyr, Inc.

Table of Contents

Introduction **2**
Safety **2**
1. General Safety **3**
2. Electrical Safety **3**
3. Laser Safety **4**
3.1 Class 4 Laser Product Safety Documents 5
4. Laser Safety Labels **6**
4.1 Product Identification Label 6
4.2 Class 4 Laser Product Warning Logotype 6
4.3 Aperture Label 7
5. Fire Safety **7**
6. Smoke and Fume Safety **8**
6.1 Laser-Generated Contaminants 8
6.2 Filtration and Exhaust 8
6.3 Additional Smoke and Fume Safety 9
7. Materials Safety **10**
7.1 Inherent Risks in Material Composition 10
7.2 Hidden Hazards: Coatings and Additives 10
7.3 Risks of Processing Unsafe Materials 11
7.4 Caution with Reflective Materials 11
7.5 Safety Precautions and Material Sourcing 11
Table of Contents **12**
Instructions **14**
1. Terminology **14**
2. Machine Schematic **14**
2.2. Schematic images 14
2.3. Power Button | Colors and Meanings 21
3. Unboxing the Optic Portable Laser Cutter **22**
3.1. Optic Shipping Box 22
3.2. Open your shipping box 23
3.3. Remove the foam 23
3.4. Remove protective masking 26
3.5. Remove protective foam 28
3.6. Accessories 30
4. Setting Up LightBurn **34**
4.1. Installing LightBurn 34
4.2. Setting up your Device 35
4.3. Installing the Rendyr Preferences 39

 © 2024 Rendyr, Inc.

4.4. Importing the Rendyr Library 40
4.5. LightBurn User Interface Diagram 44
5. Optic Initial Set-up 45
5.1. Release 45
5.2. Positioning the upper body 46
5.3. Setting up the Support Leg 48
5.3.2. Leveling out the upper body 49
5.4. Connecting Power and Data 51
5.5. Connecting Laser Module 53
5.6. Laser Safety Shield 55
5.7. Finished setting up 55
5.8. Detaching the Cutting Mat 56
5.8.1. Remove Cutting Mat 56
5.8.2. Attaching the Cutting Mat 57
5.8.3. Operating the Optic without the Cutting Mat 58
6. Start to Finish | First Laser Cut with the Optic 59
6.1. Open LightBurn File 59
6.2. Review LightBurn Design 60
6.3. Adding your Name 61
6.4. Positioning your name 63
6.5. Change Layer Settings 66
6.6. Check Preview 67
6.7. Positioning your material 68
6.8. Laser Module Height Adjust 69
6.9. Framing your Project 71
6.10. Starting your Cut 77
6.11. Finishing and Showing Final Results 79
7. Cleaning & Aftercare for the Optic 80
7.1. Cleaning Kit 80
7.2. Cleaning the Cutting Mat 80
7.3. Cleaning the Laser Module 83
7.4. Cleaning Laser Safety Shield 86
7.5. Cleaning the Pre-Filter 88
7.6. Replace Optic Filter 90

 © 2024 Rendyr, Inc.

Instructions

1. Terminology

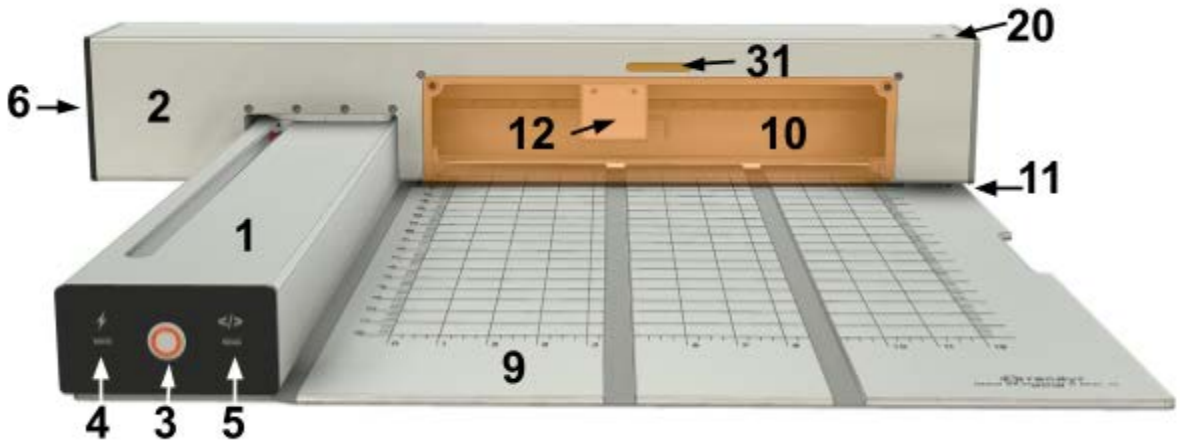
Vector cutting: LightBurn: Line (cutting all the way through the material)

Vector engraving: LightBurn: Line (scoring the material)

Raster engraving: LightBurn: Fill (stepped removal of material in a defined boundary)

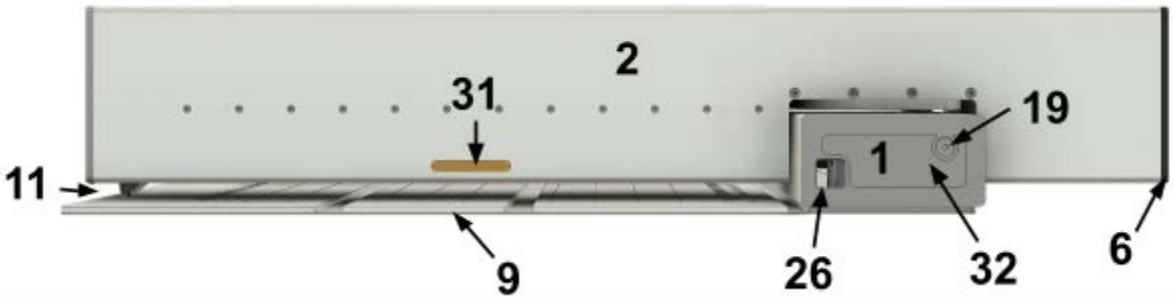
2. Machine Schematic

2.2. Schematic images

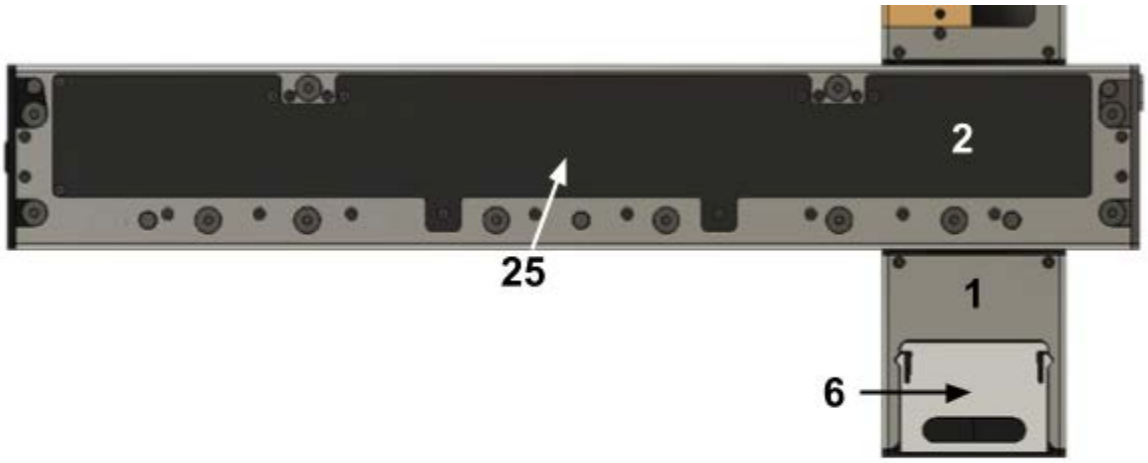


1: Lower Body
2: Upper Body
3: Power Button
4: Power Connection Port
5: Data Connection Port
6: Filter
9: Cutting Mat
10: Safety Shield
11: Support Wheel
12: Laser Module
20: Support Leg Adjustment Bolt
31: Product Safety Label

© 2024 Rendyr, Inc.

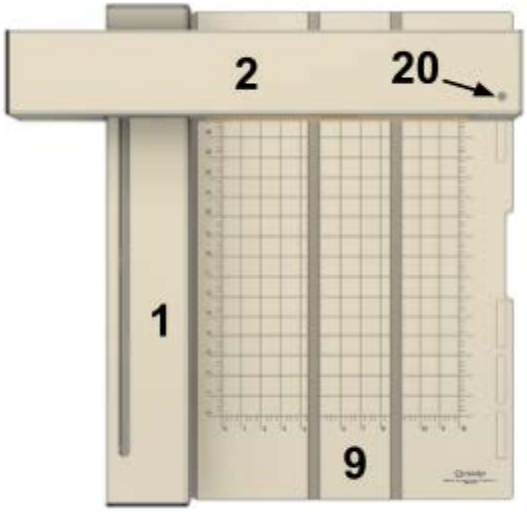


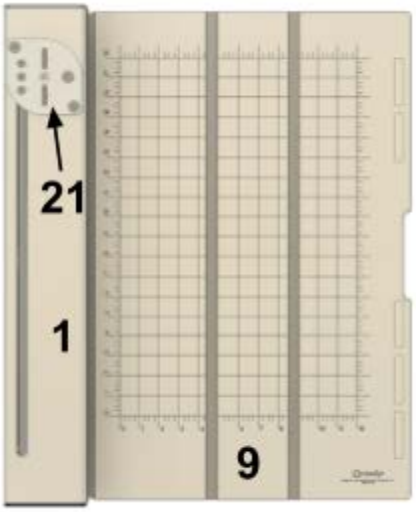
1: Lower Body
2: Upper Body
6: Filter
9: Cutting Mat
11: Support Wheel
19: Lower Belt Tensioner
26: Accessory Port
31: Product Safety Label
32: Identification Labels

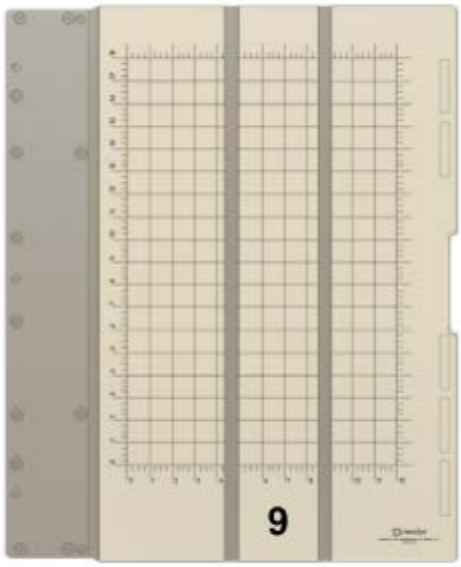


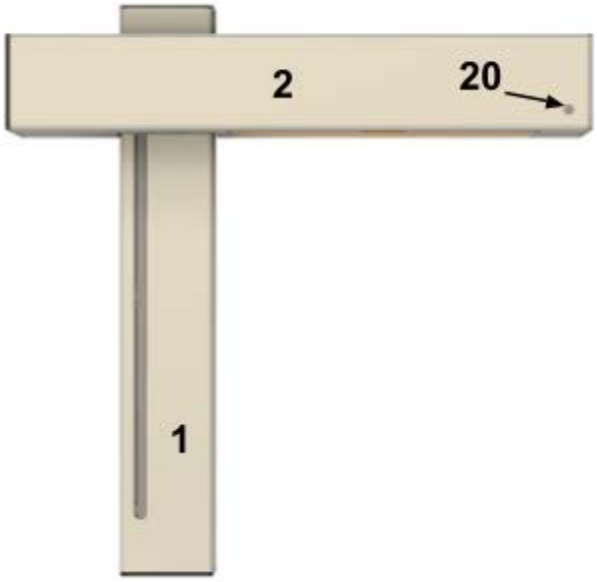
1: Lower Body
2: Upper Body
6: Filter
25: Access Panel

© 2024 Rendyr, Inc.





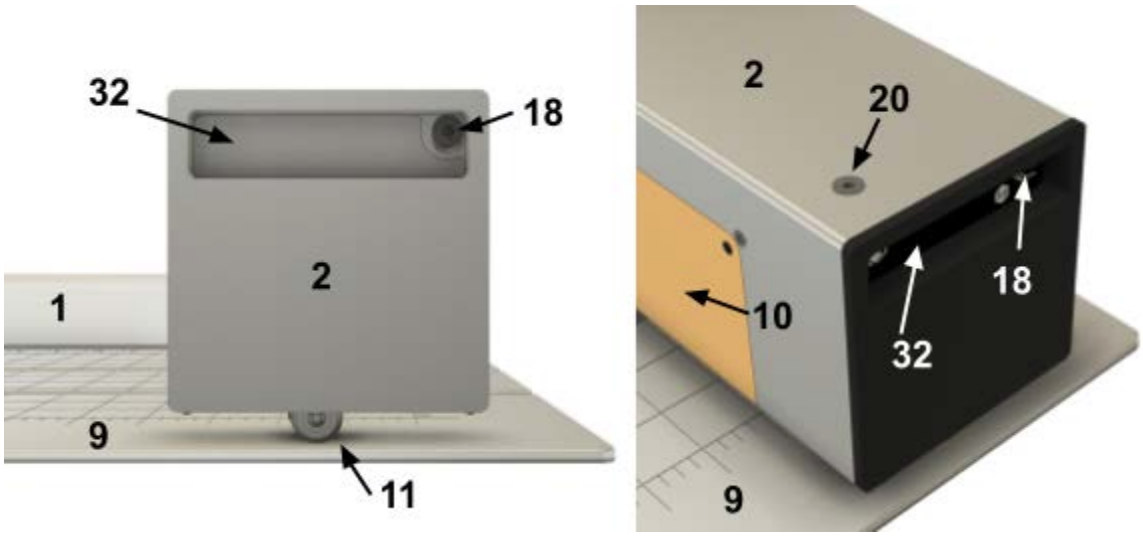




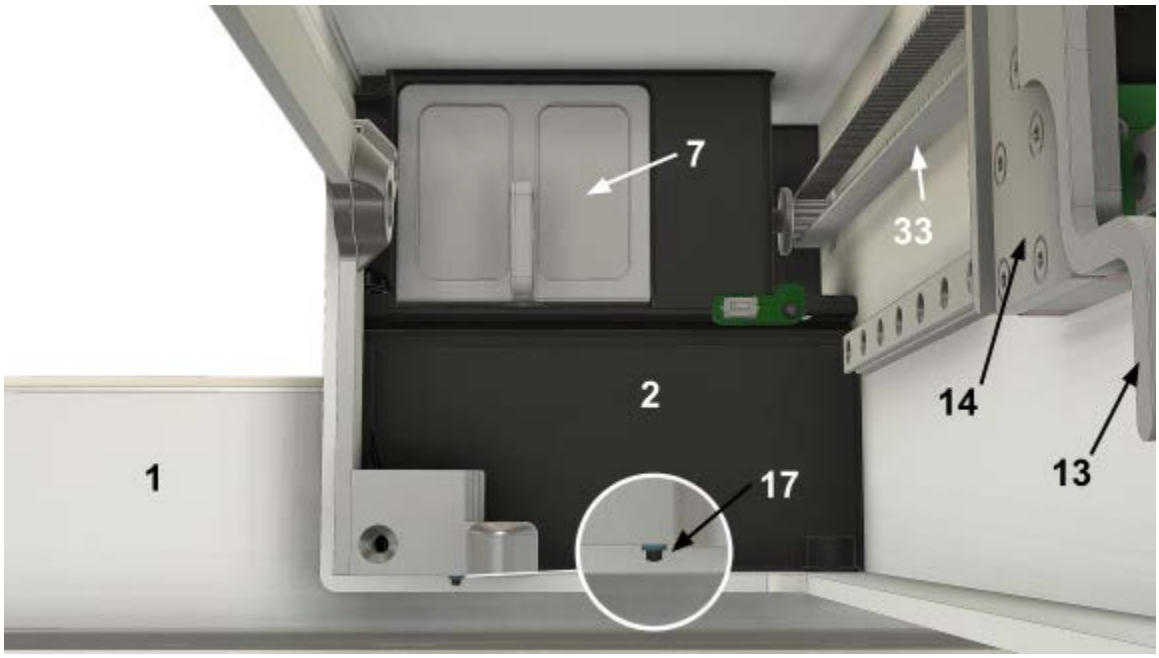
1: Lower Body
2: Upper Body
9: Cutting Mat

20: Support Leg Adjustment Bolt
21: Hinge Plate

© 2024 Rendyr, Inc.

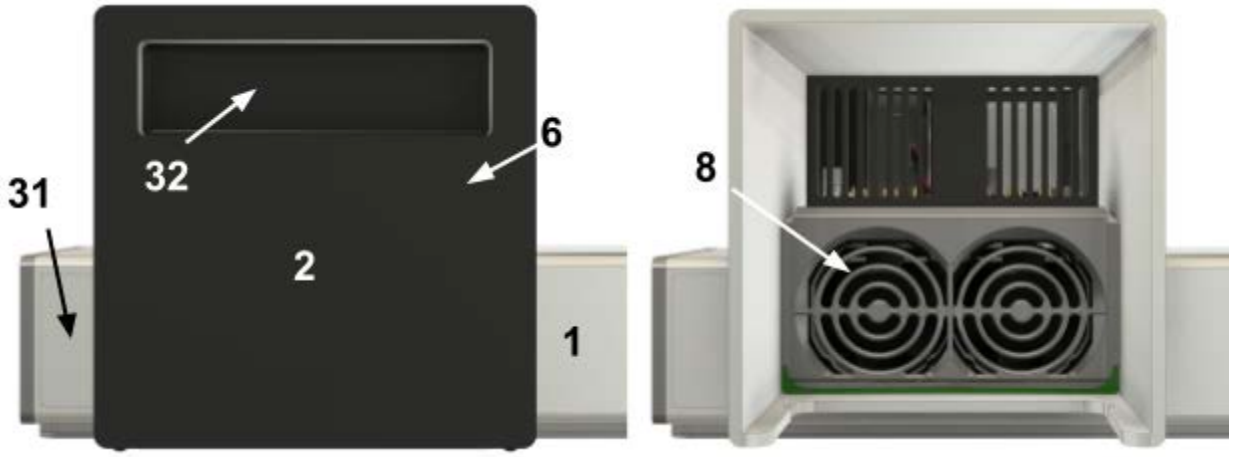


1: Lower Body
2: Upper Body
9: Cutting Mat
10: Safety Shield
11: Support Leg
18: Upper Belt Tensioner
20: Support Leg Adjustment Bolt
32: Identification Labels

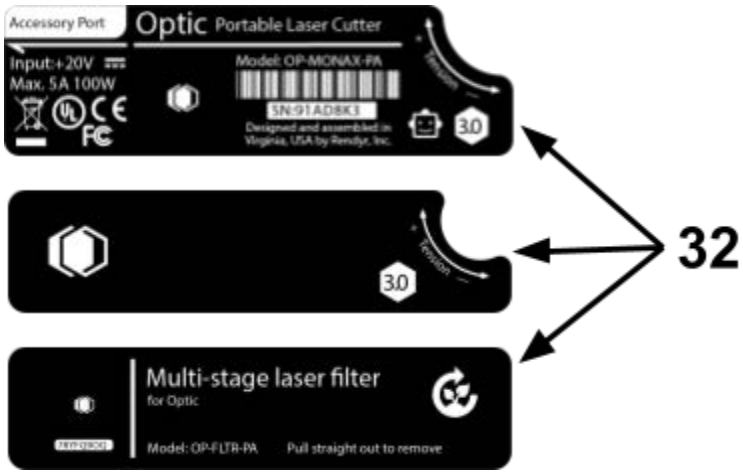


1: Lower Body
2: Upper Body
7: Pre Filter
13: Cam Lever
14: Back Plate
17: Safety Shield Trigger
33: Belts

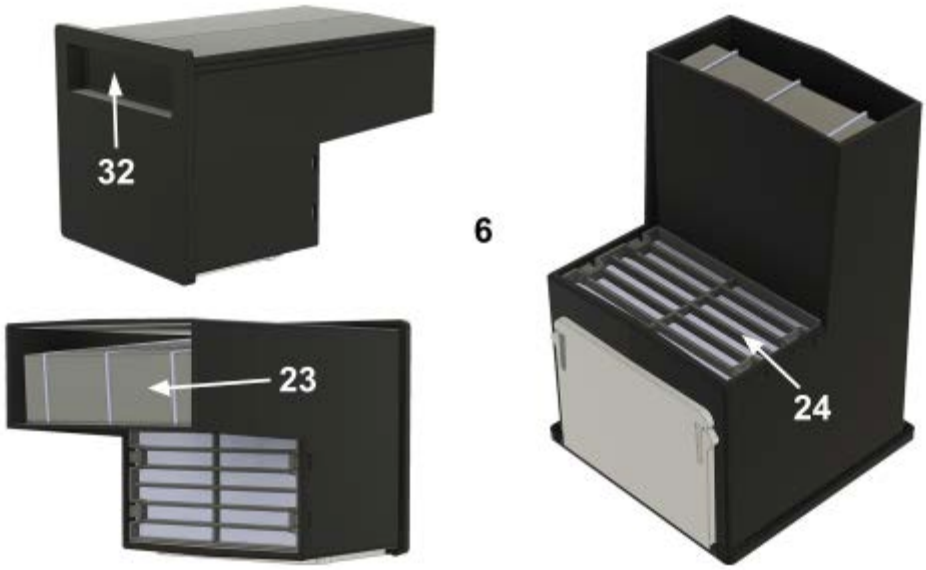
© 2024 Rendyr, Inc.



1: Lower Body
2: Upper Body
6: Filter
8: Internal Exhaust Fan
31: Product Safety Label
32: Identification Label



© 2024 Rendyr, Inc.

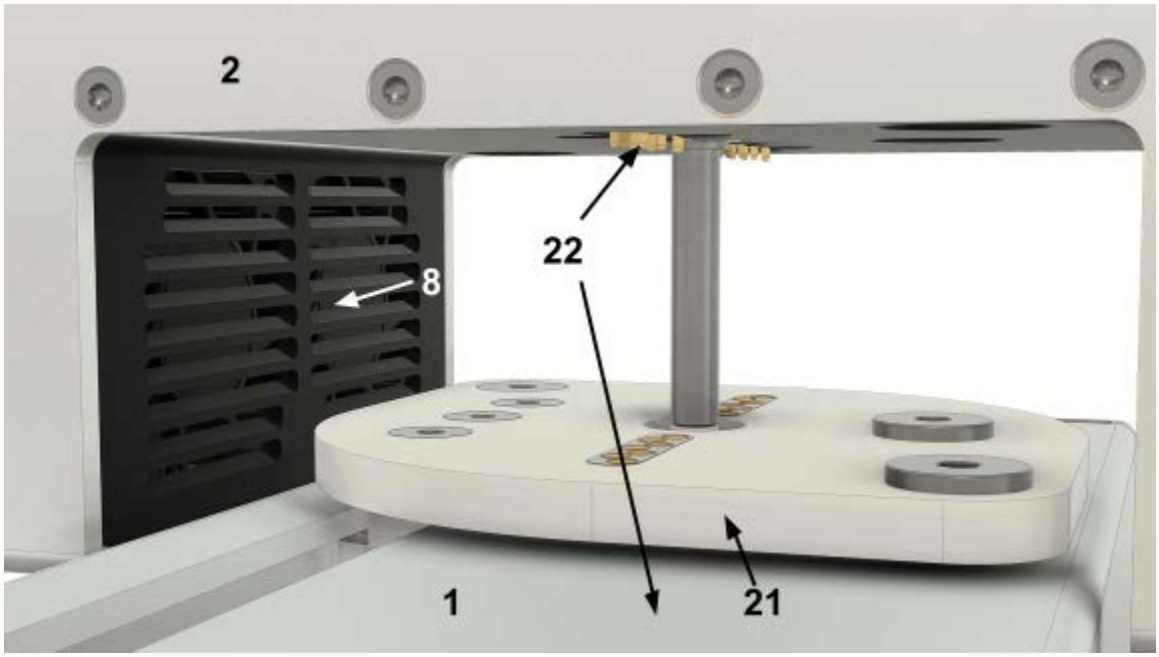


6: Filter

23: Filter Inlet

24: Filter Outlet

32: Identification Label



1: Lower Body

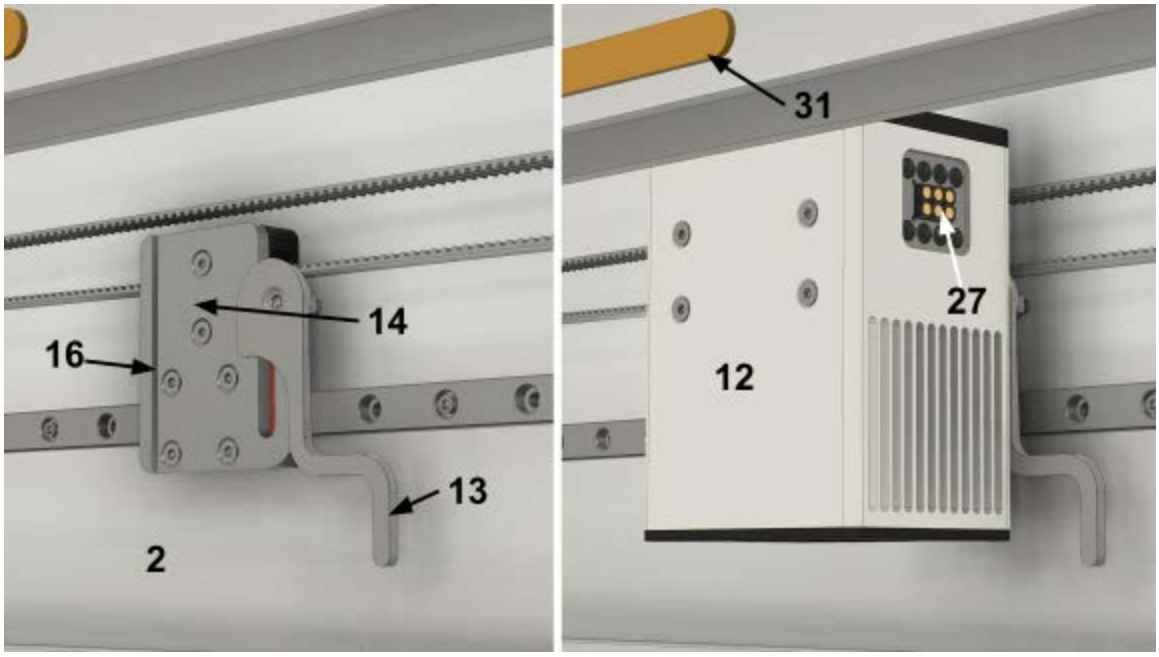
2: Upper Body

8: Internal Exhaust Fans

21: Hinge Plate

22: Connections Pins

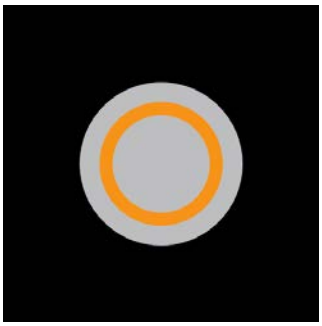
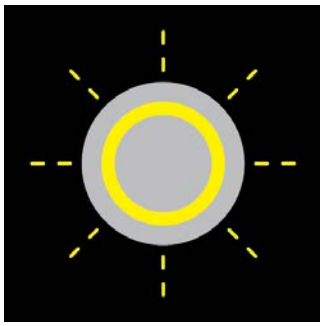
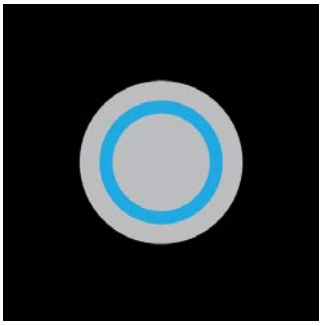
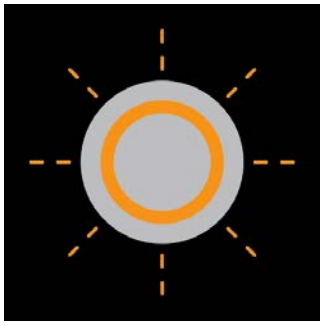
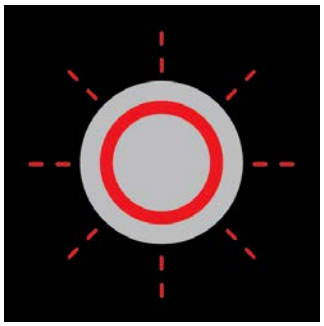
© 2024 Rendyr, Inc.



2: Upper Body
12: Laser Module
13: Cam Lever
14: Back Plate
15: Dovtail (Laser Module)
16: Dovtail (Backplate)
27: Laser Module Cable Port
28: Laser Module Lens
29: Laser Module Bottom Cap
30: Laser Module Upper Cap
31: Product Safety Label
32: Identification Label
33: Belts

© 2024 Rendyr, Inc.

2.3. Power Button | Colors and Meanings

Normal Operation	Alerts/Warnings
 **Solid Orange** Power and Data initialized	 **Flashing Yellow + Beeping Sound** Optic is tilted / Upper-body not seated correctly on Lower-body / Laser Module not connected.
 **Solid Blue** Drivers engaged; ready to laser-cut	 **Flashing Orange + Beeping Sound** Safety shield trigger not engaged, need to correct shield
 Pulsing Green Laser-cutting in progress	 **Flashing Red + Constant Buzzer** Flame Sensor / Over-temperature detected; Optic will stop Over-temperature detected; Optic will stop current laser-cut and move out of the way of the cutting area.

© 2024 Rendyr, Inc.

3. Unboxing the Optic Portable Laser Cutter

3.1. Optic Shipping Box

When you receive your Optic Portable Laser Cutter, it will arrive in a single custom-made shipping box. The exterior handle will allow for easy carrying and can be reused to transport the Optic when traveling or storing, along with all the included accessories.

© 2024 Rendyr, Inc.

3.2. Open your shipping box

Open the shipping box by placing the handle side facing toward you.

When opened, you will see an envelope letter containing important documention and a protective foam cover with the Optic underneath.

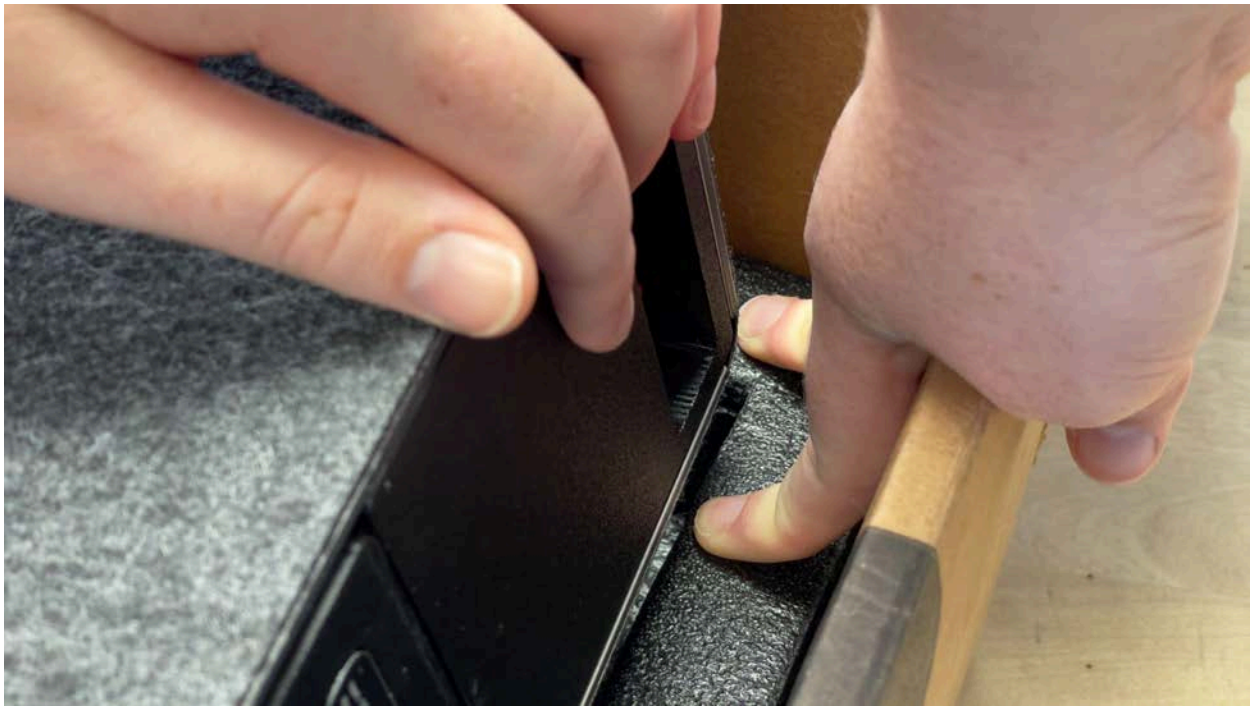
3.3. Remove the foam

Remove the upper foam cover carefully.

© 2024 Rendyr, Inc.

The Optic is held in place by another protective foam housing underneath.

© 2024 Rendyr, Inc.

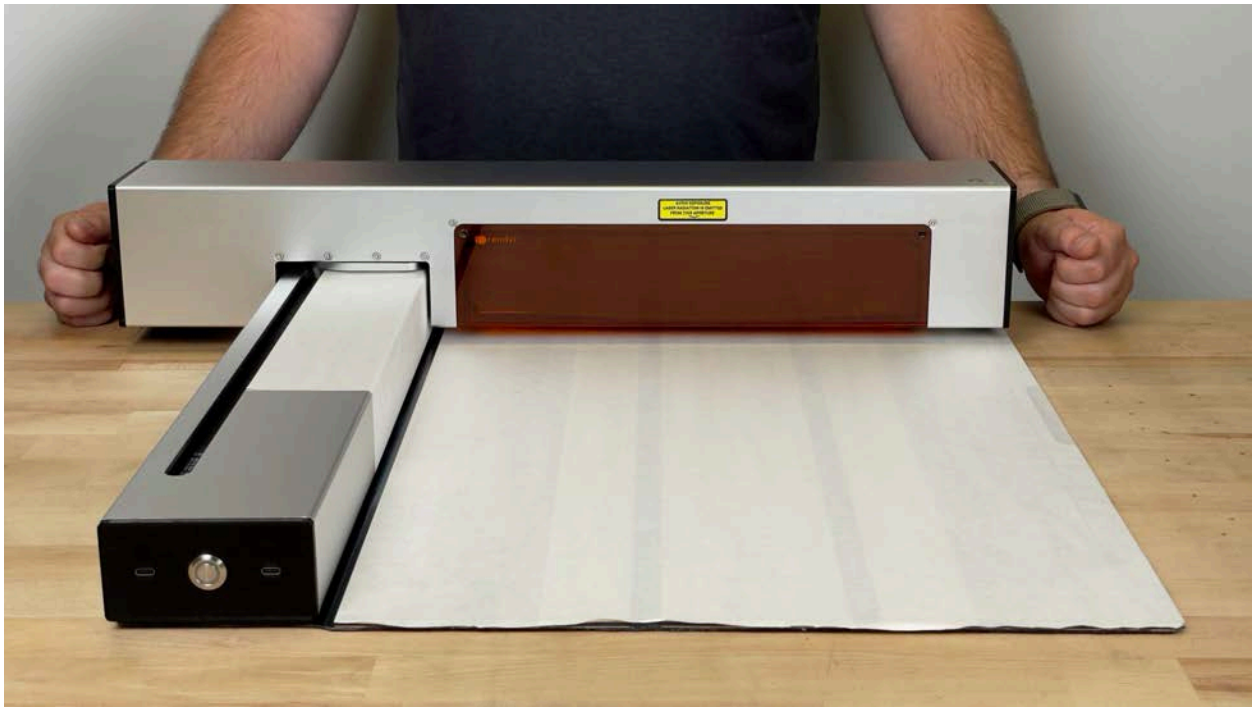


Pull the Optic out by supporting the foam layer with one hand and lifting up on one end of the Optic.

Accessories and components used to power and maintain the Optic are stored at the bottom of the shipping box. All accessories are listed below:

© 2024 Rendyr, Inc.

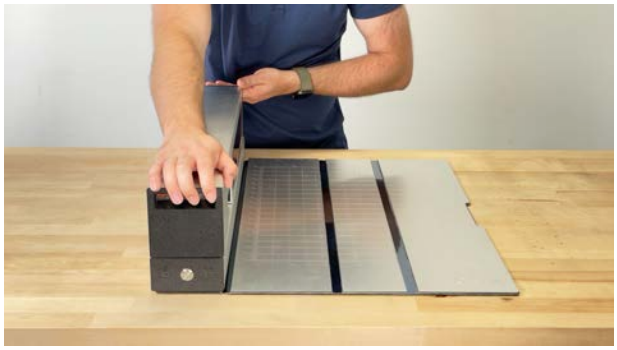
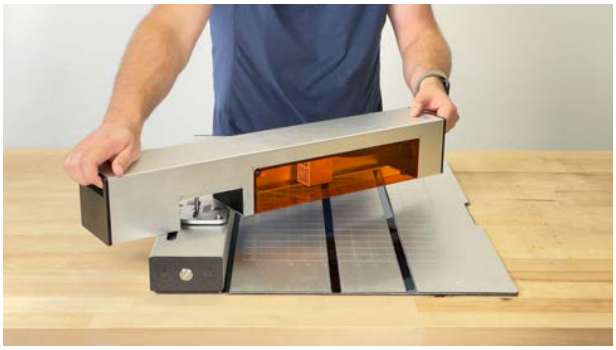
3.4. Remove protective masking



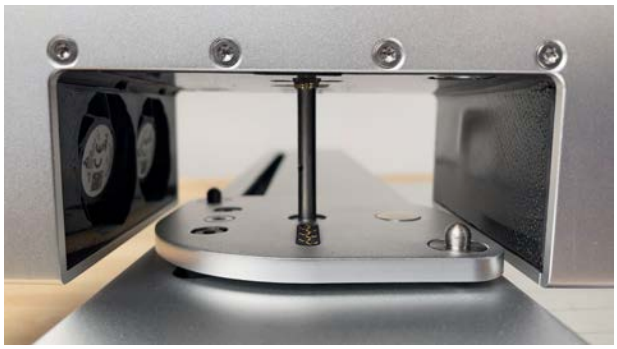
When you receive your Optic a protective masking will be applied to the **Lower Body** and **Cutting Mat.** You will need to unfold the cutting mat descirbed below and in **Section 5. Optic Initial Set-Up**

Unclasp the cutting mat from the lower body and lay it flat on the table or surface you are working on.

© 2024 Rendyr, Inc.

Grab the upper body from both handles and rotate it 90 degrees on the hinge plate till the upper body is perpendicular to the lower body.



Lower the upper body, so it sits on the Hinge-Plate and Support-Leg. This will allow you to have access to remove the protective masking

Gently peel off the protective masking on the Cutting mat and Lower body. (As shown above)

© 2024 Rendyr, Inc.

3.5. Remove protective foam

The Laser Module is secured in a protective foam casing stored inside the upper body.

Gently remove the foam casing from the upper body and take out the Laser Module and Cable.

© 2024 Rendyr, Inc.

For installation instructions for the Laser Module and correct procedure for plugging in the laser module cable see **Section 5.5. Connecting Laser Module**.

© 2024 Rendyr, Inc.

3.6. Accessories

Rendyr Envelope

Rendyr Sticker

Hello World “Rendyr” Comparison Piece

3x - Orange Hello World Test Paper
1x - Black alluminum Backing

Safety Glasses Case

Safety glasses

...

© 2024 Rendyr, Inc.

1x - Optic Filter (Right)
1x - Optic Pre - Filter (Left)

Power + Data Box

USB-C Cables (6ft) - 2x

...

Power Supply

...

© 2024 Rendyr, Inc.

Cleaning Kit Box

Cutting Mat Hinge Brush

...

Optic Cleaning Solution Spray

...

Swabs - 100x

...

Magic Eraser Sponges - 2x

...

Static-Free Cleaning Cloth

...

© 2024 Rendyr, Inc.

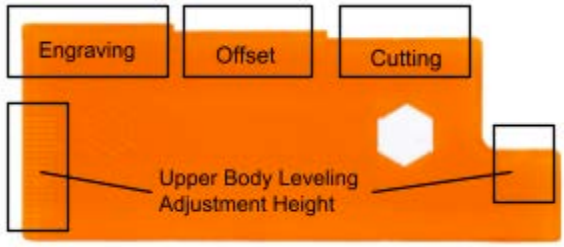
Maintenance Kit Box

3mm Hex Key

...

Small flat head screwdriver

...



Height Gauge

The Height Gauge has three levels

- **The Cut Height -** (Lowest setting) which is used more specifically for cut layers
- **The Engrave Height -** (Tallest setting) which is used more specifically for engraving and rastering. Or in certain instances thin materials (ie: Paper) where the Engrave setting would be better used to cut through the materials.
- **The Offset Height -** is an in-between offset position for both Cutting and Engraving.
- **Upperbody Adjustment Height -** used with the support leg to level the upper body to the cutting area.

© 2024 Rendyr, Inc.

4. Setting Up LightBurn

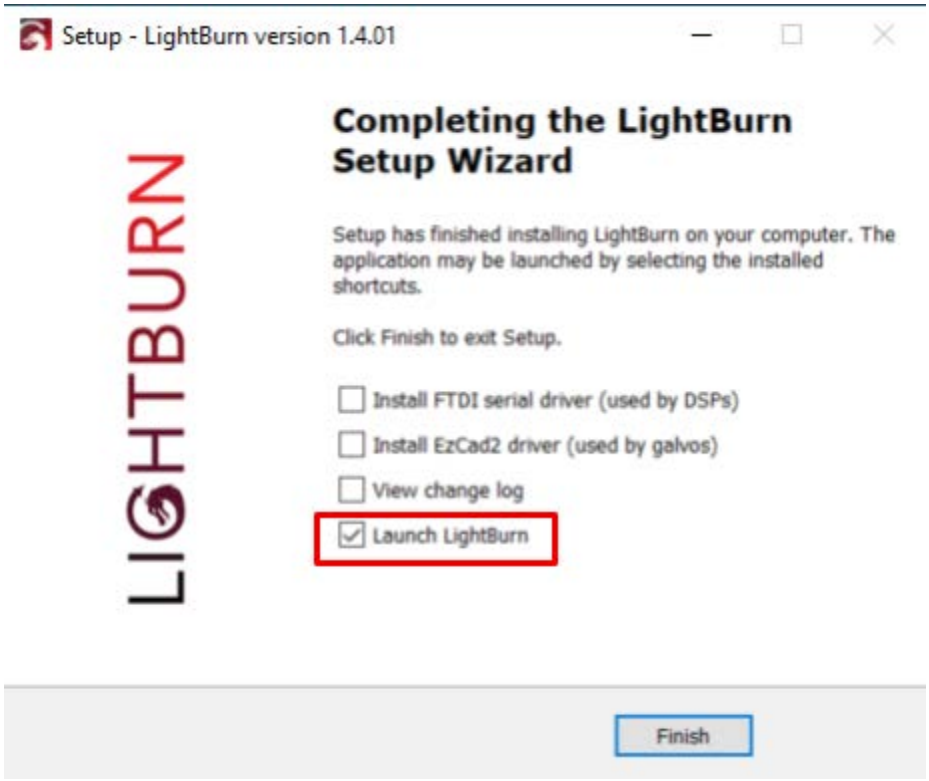
The Optic Portable Laser Cutter uses the editing and control software, LightBurn. If you haven't yet, you can purchase a LightBurn - GCode License Key and download the software here on their website. The license key will be needed when activating your LightBurn license after installing the software on your computer.

This chapter will guide you through installing LightBurn and customizing it for the Optic Portable Laser Cutter with our custom LightBurn setup files, which you can download from our website.

> **Note:** To install LightBurn go to their website and follow the instructions provided on their Downloading & Trial page. [LightBurn Download and Trial Page]

4.1. Installing LightBurn

4.1.1.

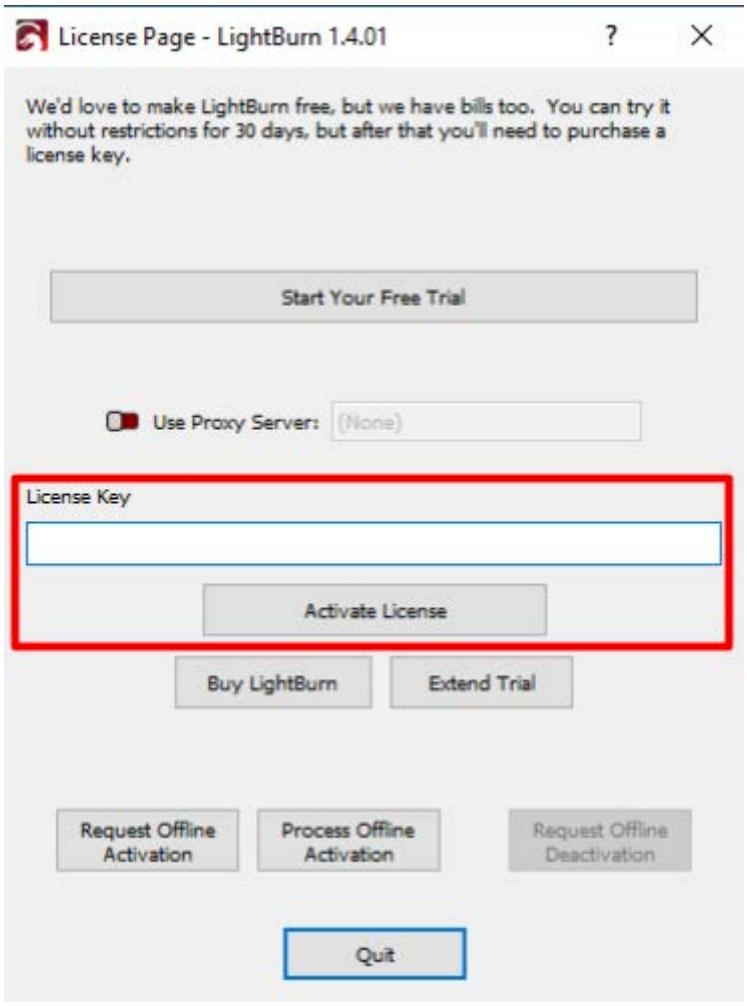


 © 2024 Rendyr, Inc.

After installing LightBurn and starting the software for the first time, the LightBurn Setup Wizard (Image above) will pop up. The only box you will need to check is the "**Launch LightBurn**". Once selected click **Finish.**

Note: The other check boxes are "**Drivers**" that don't apply to using the Optic Portable Laser Cutter and the "**View Change Log**" simply shows all the changes LightBurn does whenever it updates its software.

4.1.2.

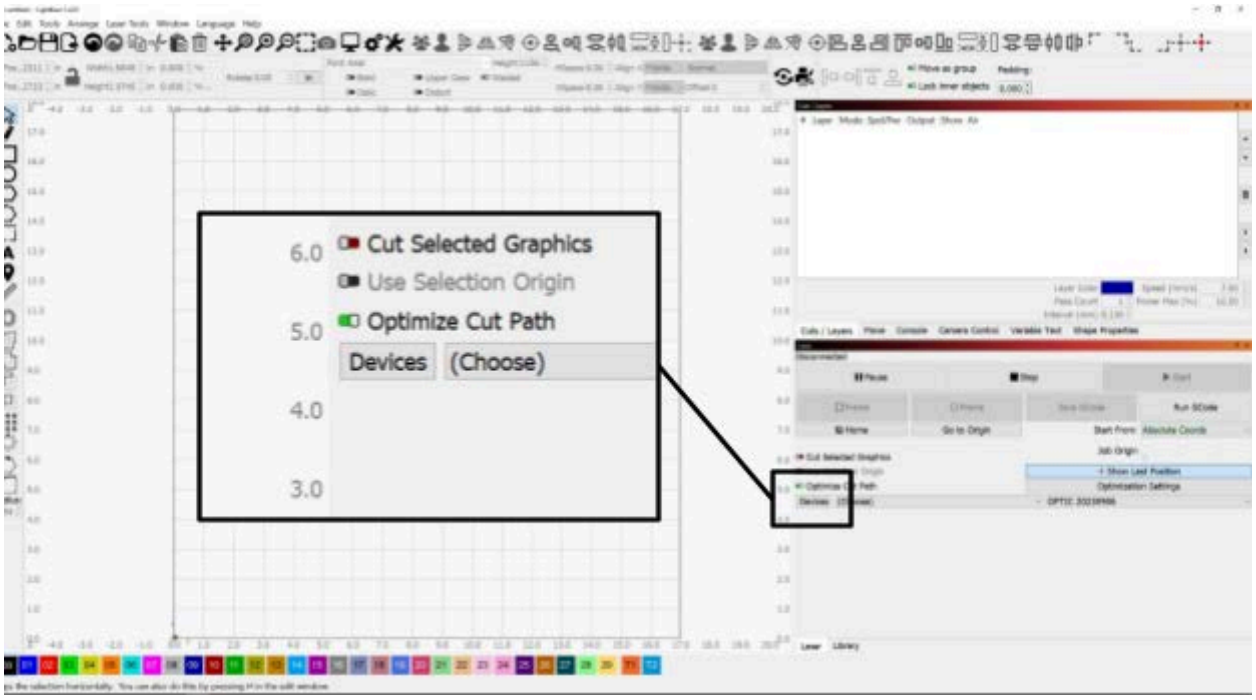


The next window that will open is the License Page. Paste your key into the text box and click on the "**Activate License"**

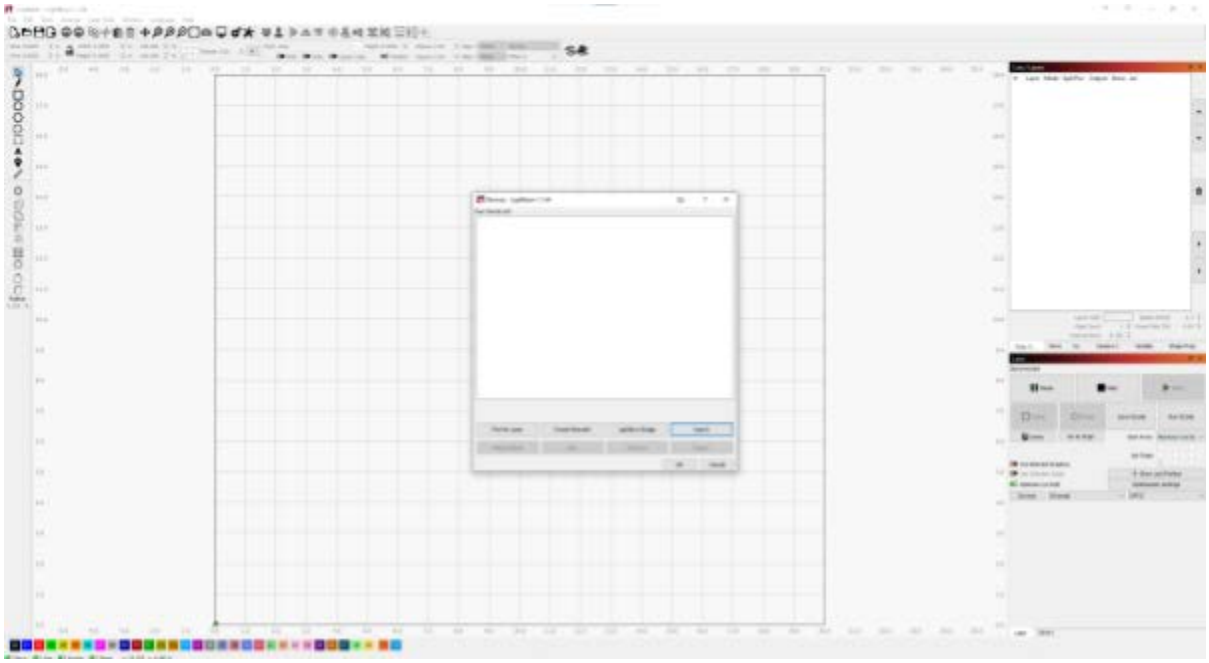
4.2. Setting up your Device

 © 2024 Rendyr, Inc.

4.2.1.



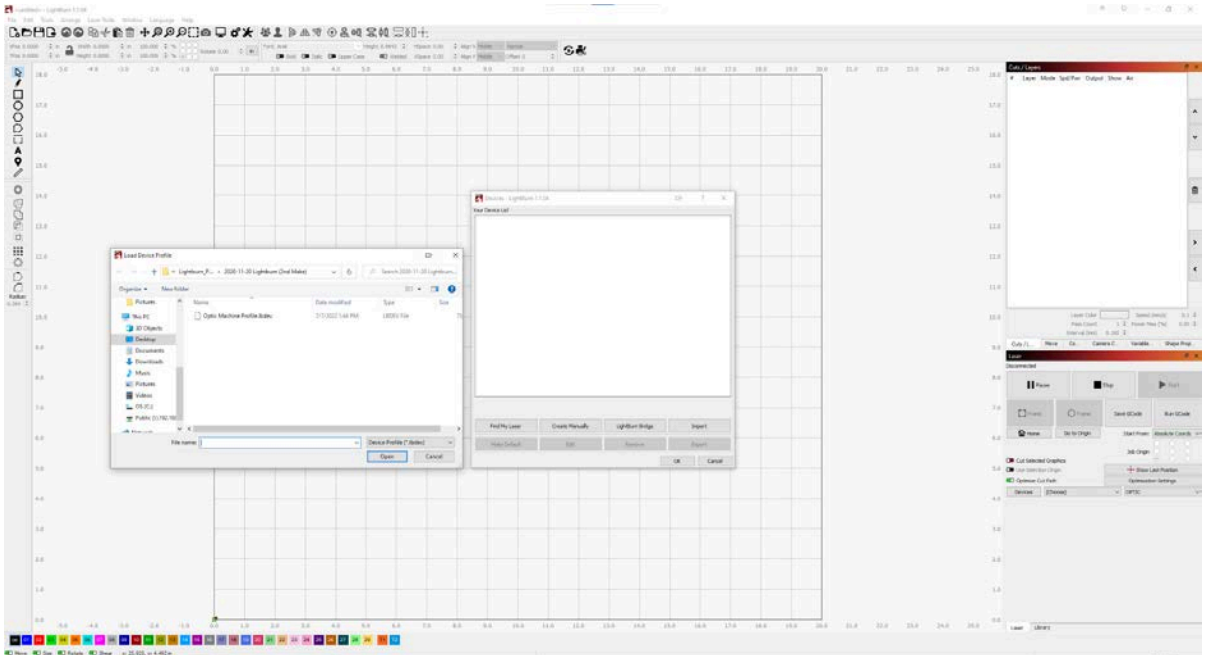
After installing LightBurn, the Devices window will appear for installing your device. If it did not appear, click on **Devices** as shown above.



The Window will now be visible as shown above.

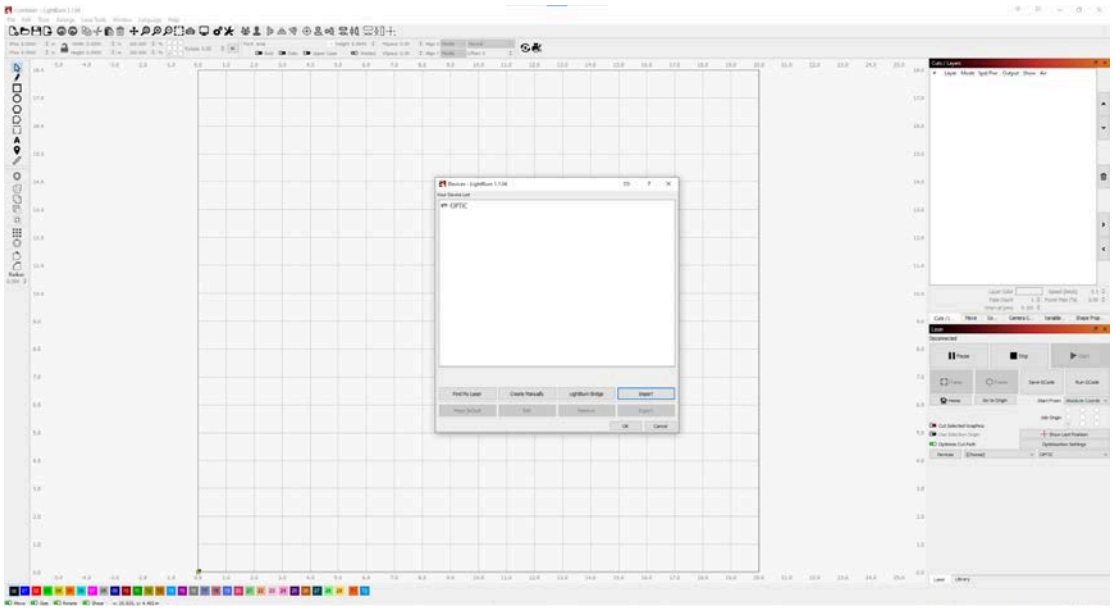
© 2024 Rendyr, Inc.

4.2.2.



Navigate and click on Import. Search in the pop up window for the file “**LightBurn Device Profile OPLC (v1.1).lbdev**” you’ve downloaded from our website. Select the file and click Open.

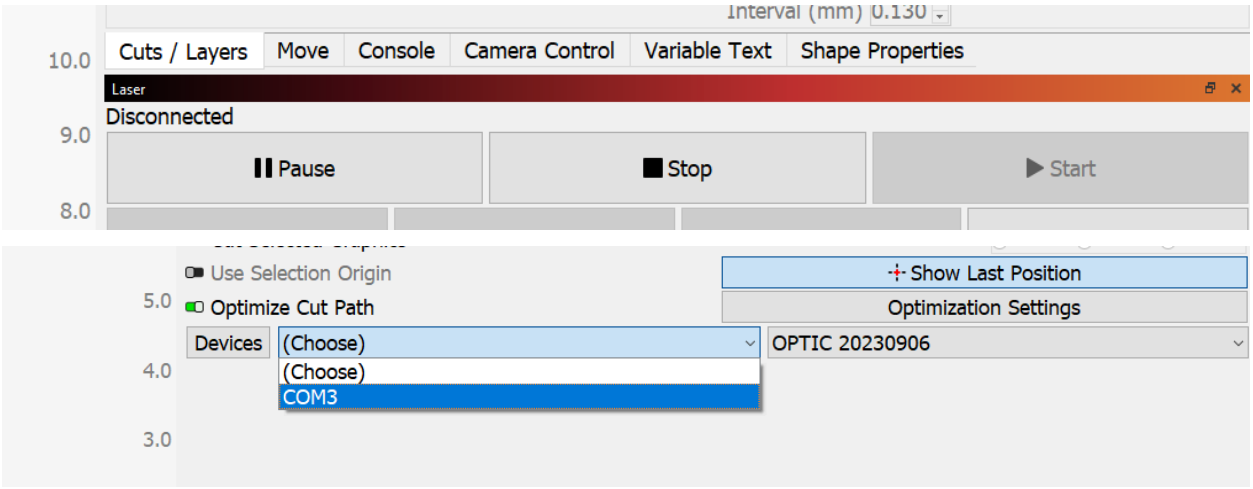
4.2.3.



Click and select “Optic”. With Optic selected, click Import. LightBurn will now be able to communicate with your Optic.

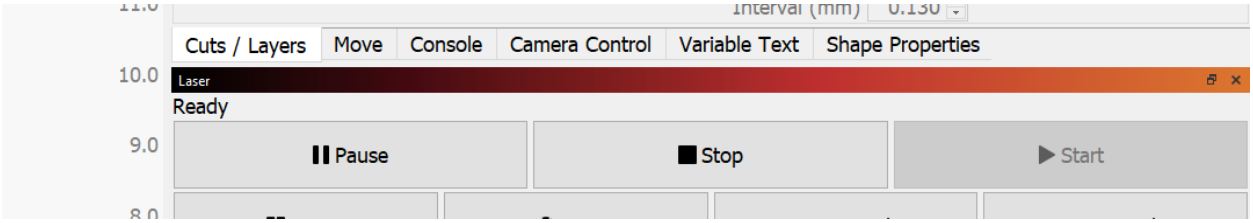
 © 2024 Rendyr, Inc.

4.2.4.



If LightBurn shows that it's still disconnected from the Optic. Navigate to where "**Devices**" is located and with the drop down menu labeled "**Choose**" select the port your cable is connected to.

Note: For a COM(#) to show a 6ft USB-C cable needs to be plugged into your computer and the **Data Port** on the Optic. This will be discussed further in Section 5 "Optic Inital Set-up".

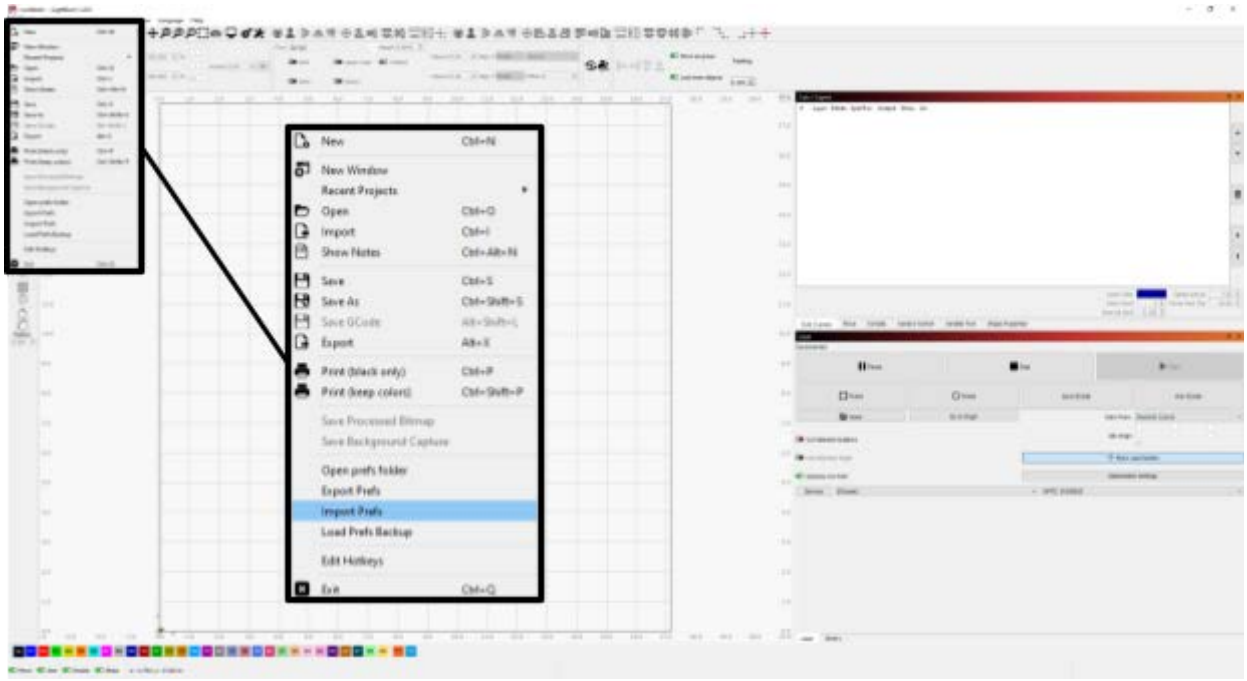


When the Optic is connected, LightBurn will confirm by switching from "**Disconnected**" to "**Ready**"

 © 2024 Rendyr, Inc.

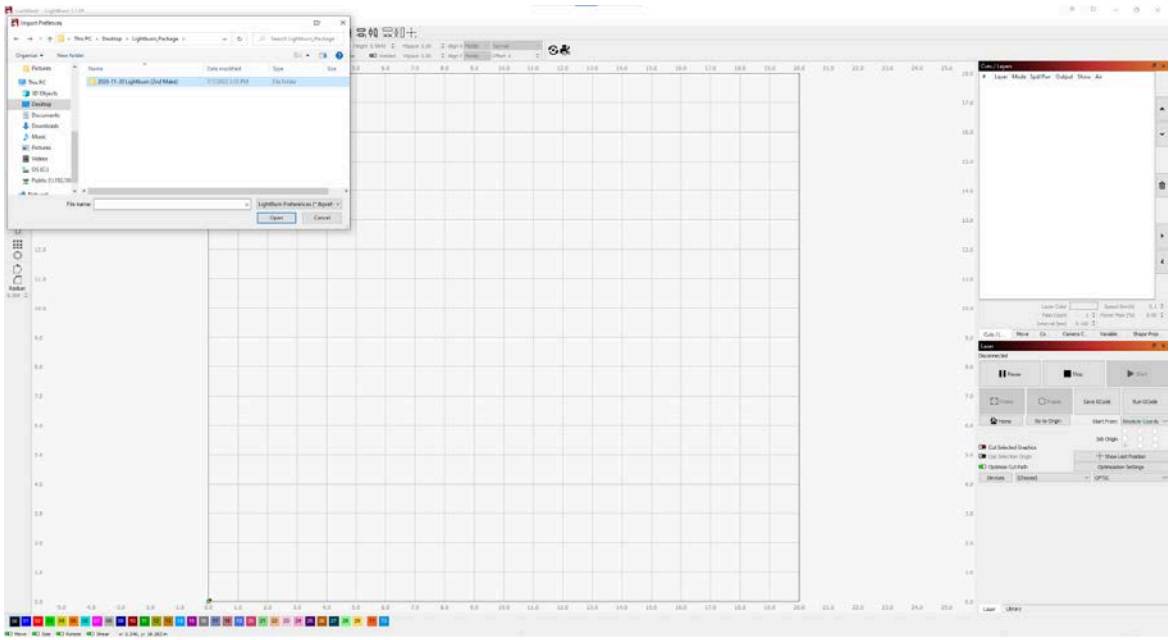
4.3. Installing the Rendyr Preferences

4.3.1.



After installing your devices, we will need to import the Rendyr-specific preferences. Navigate to the top left side of the screen and select File. In the drop-down menu, click on Import Prefs.

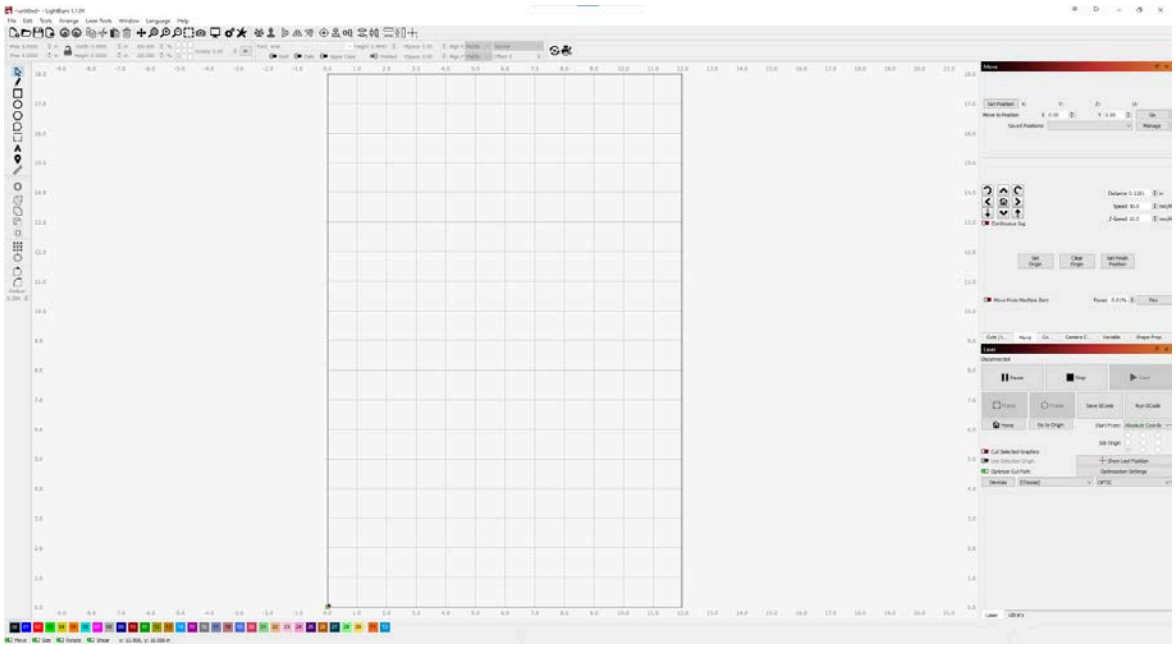
4.3.2.



 © 2024 Rendyr, Inc.

Navigate to the custom LightBurn setup files you downloaded from our website, select the file “**LightBurn Preferences OPLC (v1.2).lbprefs**” and click Open.

4.3.3.



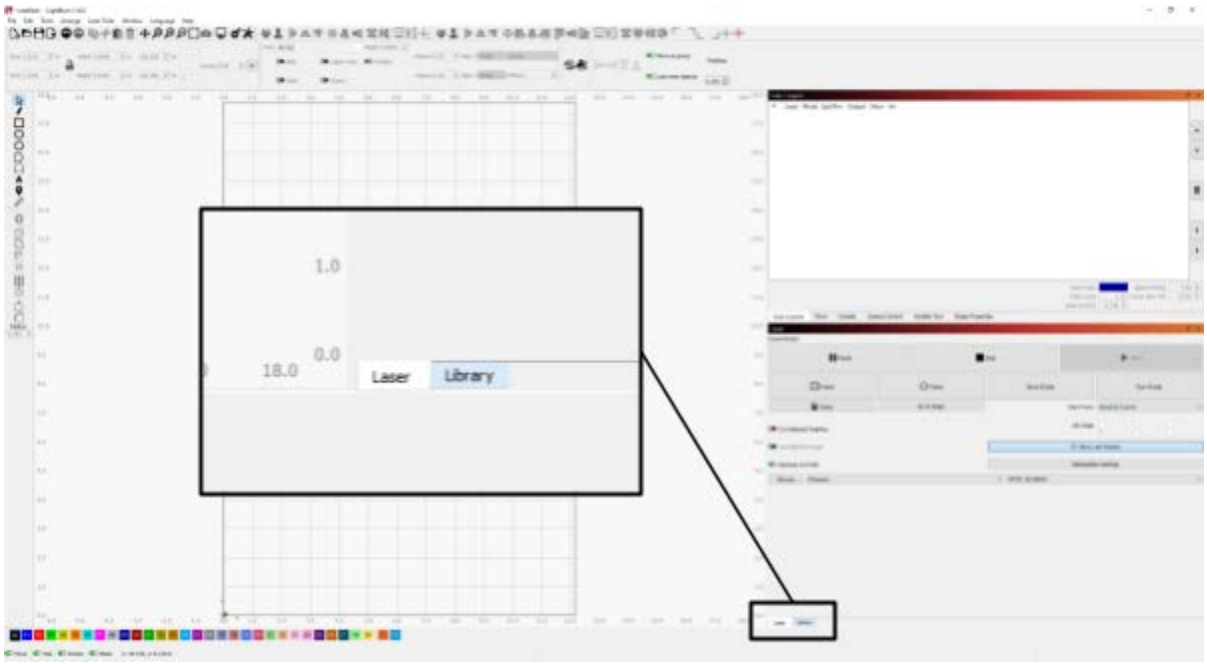
LightBurn will now be customized to work more effectively with the Optic.

4.4. Importing the Rendyr Library

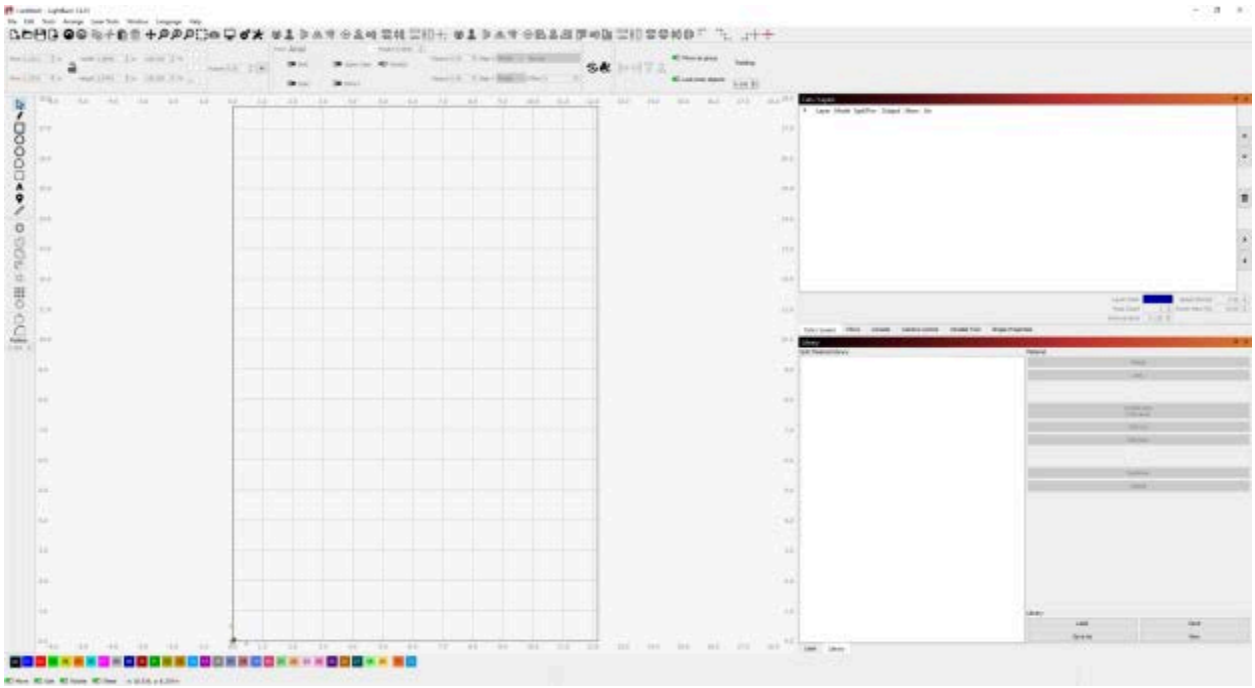
The final step for setting up LightBurn is importing the Rendyr custom library.

© 2024 Rendyr, Inc.

4.4.1.

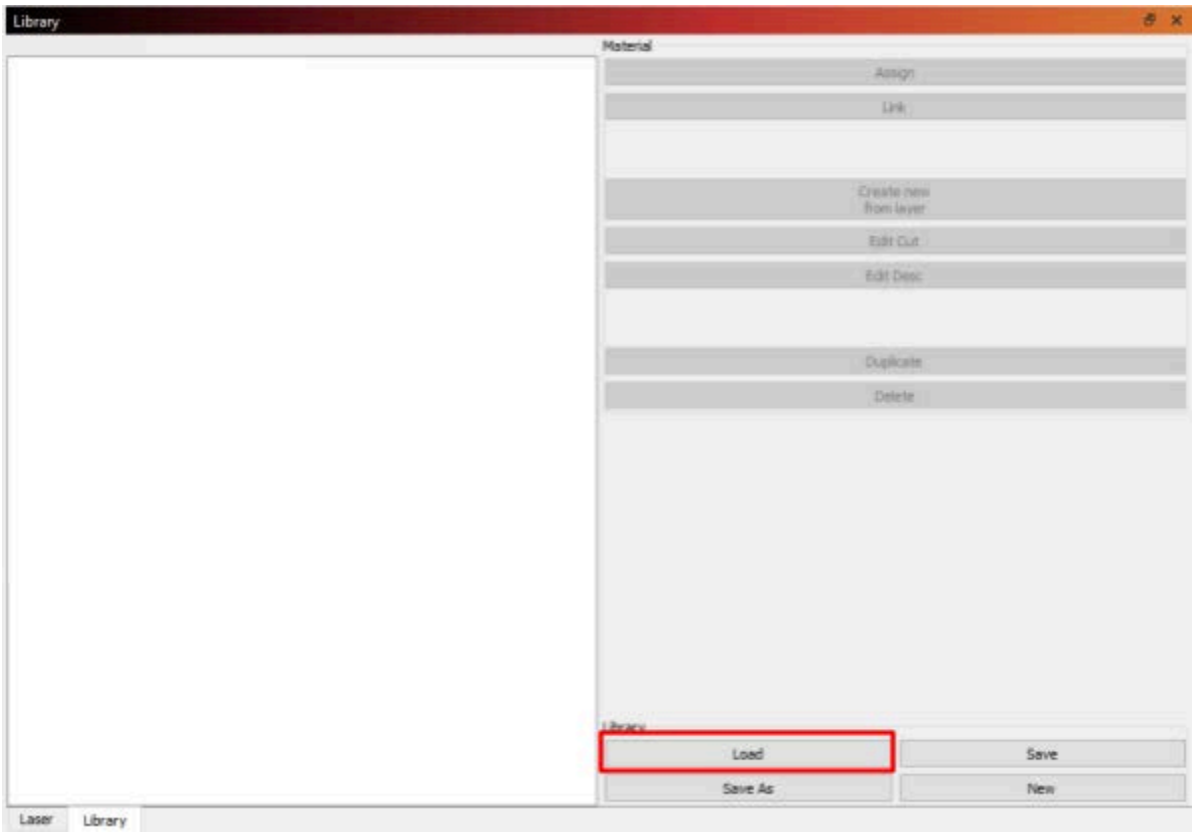


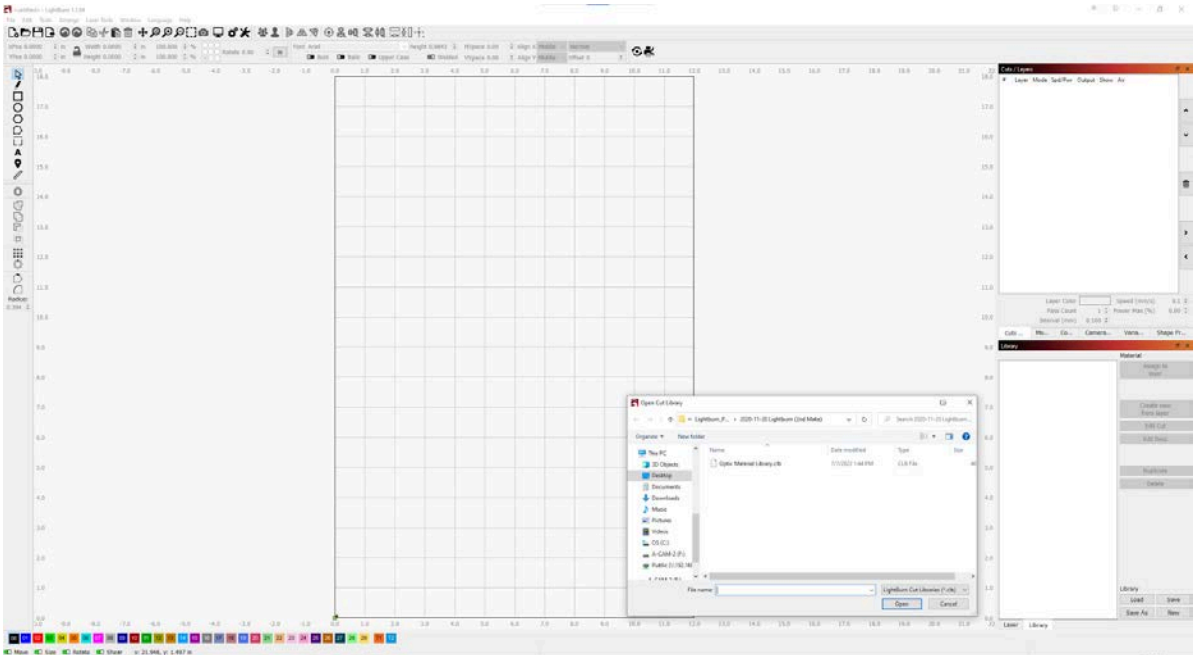
Navigate to the bottom right corner and click on the Library tab.



 © 2024 Rendyr, Inc.

4.4.2.

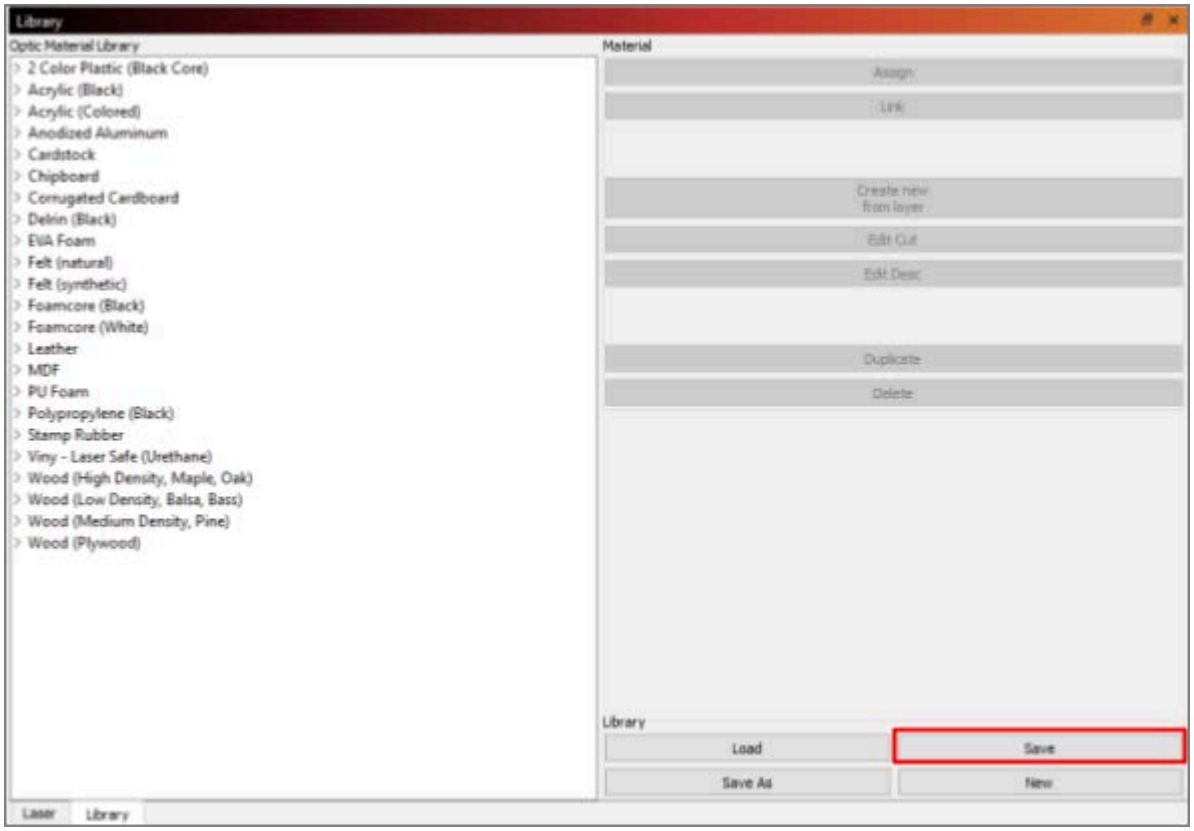




Click Load. Search for the custom LightBurn setup file named “**LightBurn Material Library OPLC (v1.2).clb**” you downloaded from our website. Select the file and click open.

© 2024 Rendyr, Inc.

4.4.3.



The custom-made library will be imported into your LightBurn Library for you to use with your different materials and thicknesses. Once the Library has been installed, click **Save** to save the library in the Library Tab.

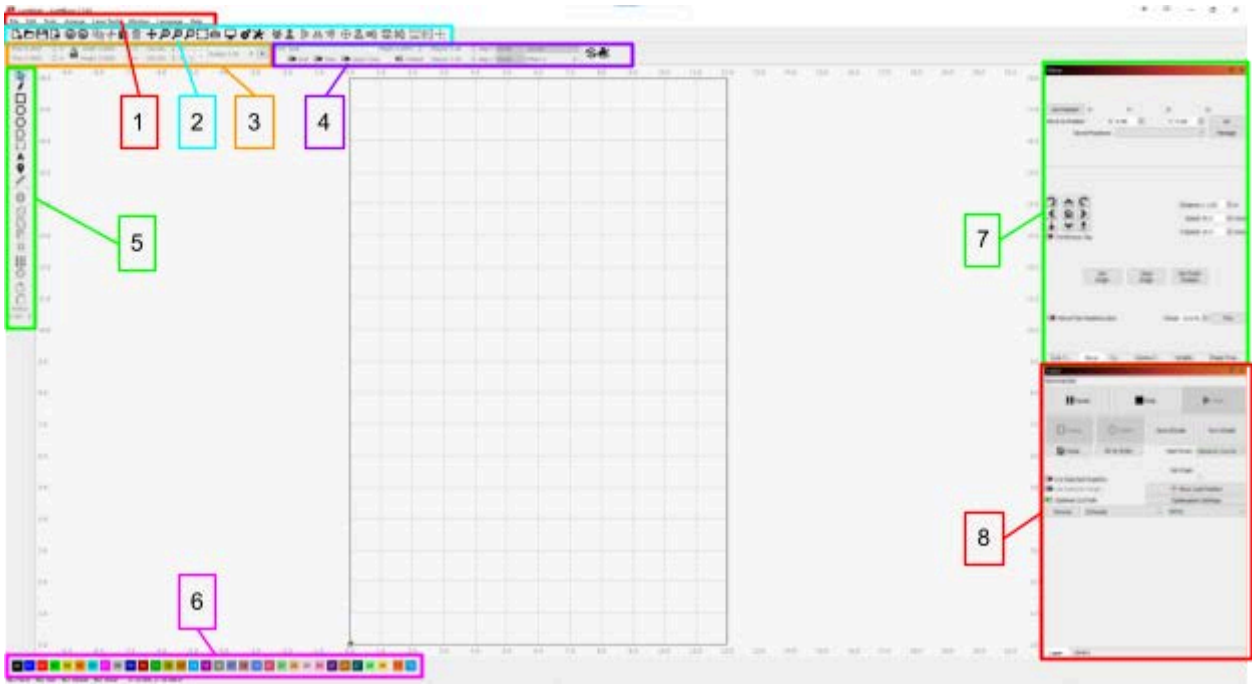
After you have imported and set up your Device, Optic-specific preferences, and Library you will have completed setting up LightBurn.

Note: For more information on the Library; including assigning layers with material library presets and creating new presets for various thicknesses and materials. See **LightBurns** website on **Material Library**.

LightBurn - Material Library

 © 2024 Rendyr, Inc.

4.5. LightBurn User Interface Diagram



1. Menus
2. Main toolbar
3. Size and Position
4. Font/Text Properties
5. Creation Tools
6. Color Palette

> **Note:** For more information on the **Color Palette** and how it can be used in conjunction with the **Cuts & Layers** window, see LightBurn's webpage on Color Palette.
>
> LightBurn - Color Palette

7. Cuts & Layers
8. Laser Controls/Library

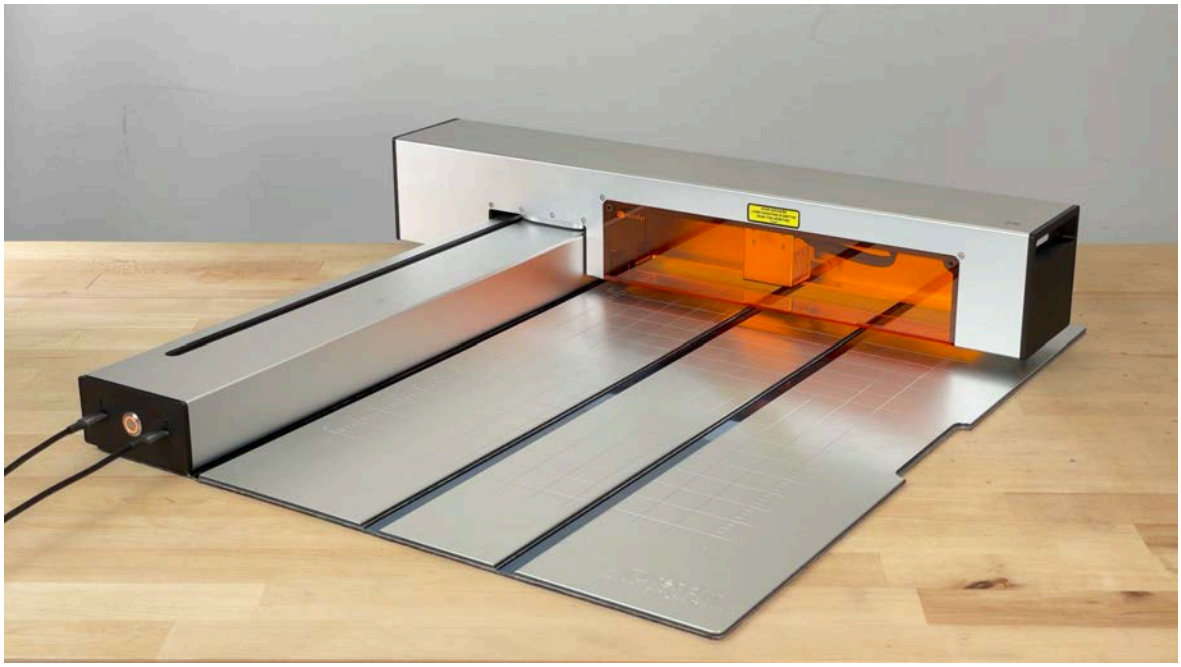
To learn more about how to use LightBurn and navigate it's interface go to LightBurn's tutorial or documentation web pages

LightBurn Tutorials

LightBurn Documentation

 © 2024 Rendyr, Inc.

5. Optic Initial Set-up



This chapter will cover the steps for setting up the Optic and placing it into Stand-by mode.

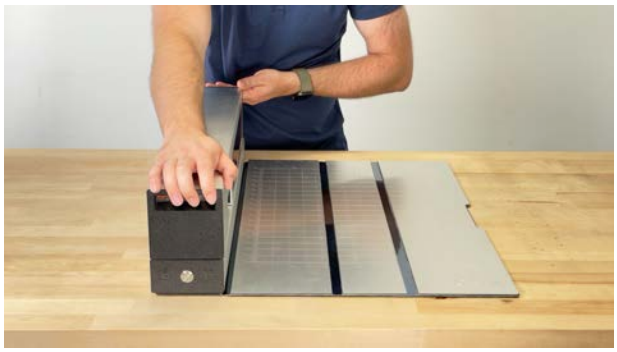
5.1. Release

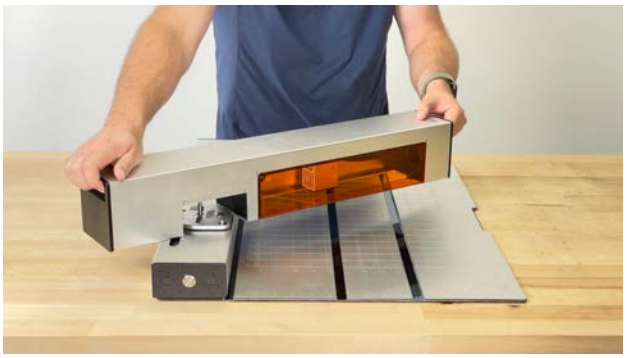
The Optic in its folded position allows for easy storage and transportation. Magnets in the cutting mat lock to the lower body to hold everything in place

© 2024 Rendyr, Inc.

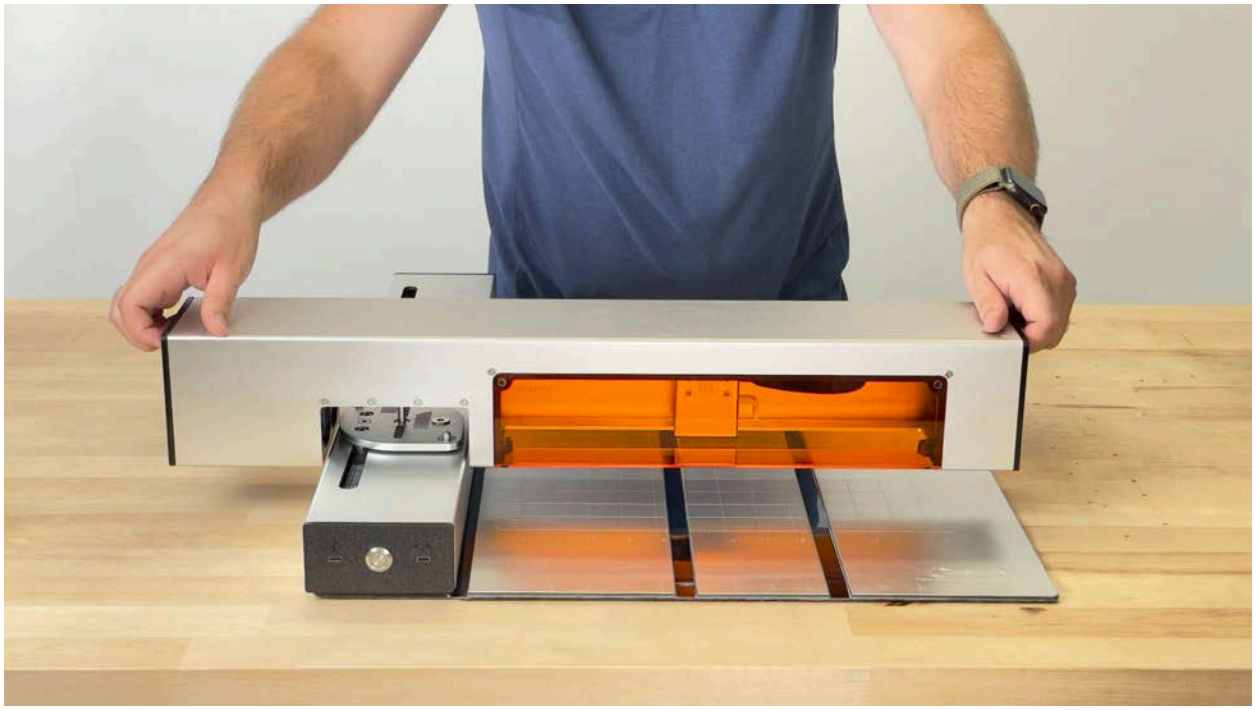
Unclasp the cutting mat from the lower body and lay it flat on the table or surface you are working on.

5.2. Positioning the upper body

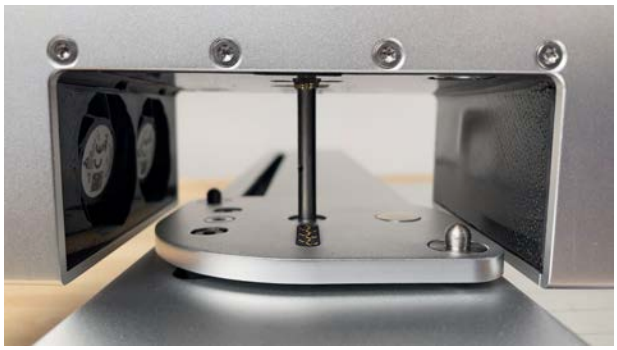




© 2024 Rendyr, Inc.

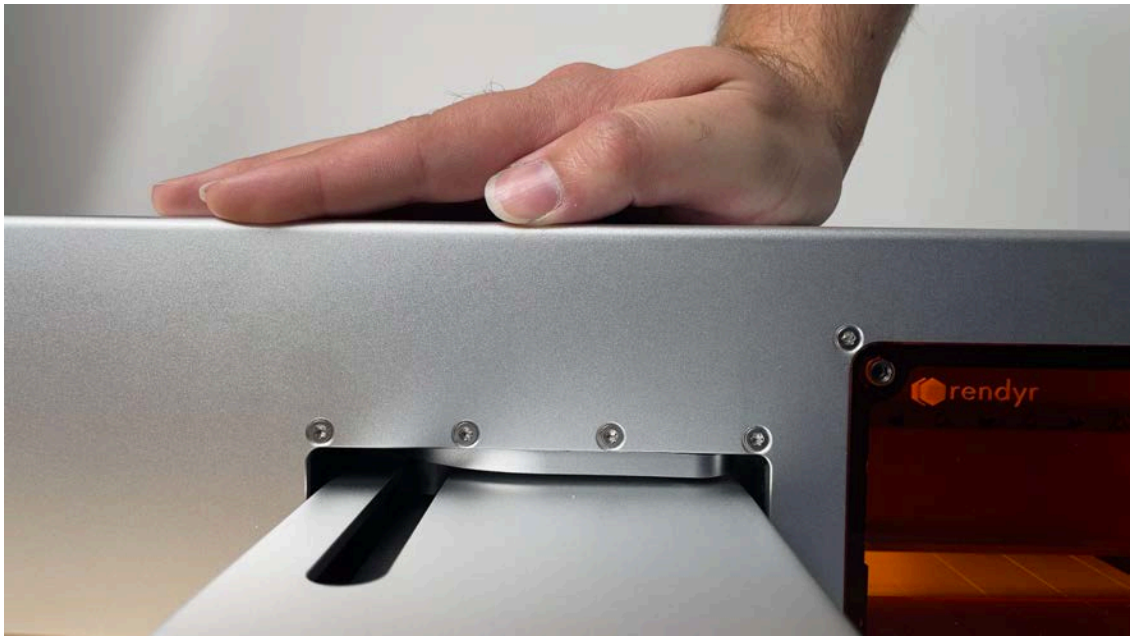


Grab the upper body from both handles and rotate it 90 degrees on the hinge plate till the upper body is perpendicular to the lower body.



Lower the upper body, so it sits on the Hinge-Plate and Support-Leg. Make sure the hinge plate pins are seated correctly and all the way.

© 2024 Rendyr, Inc.

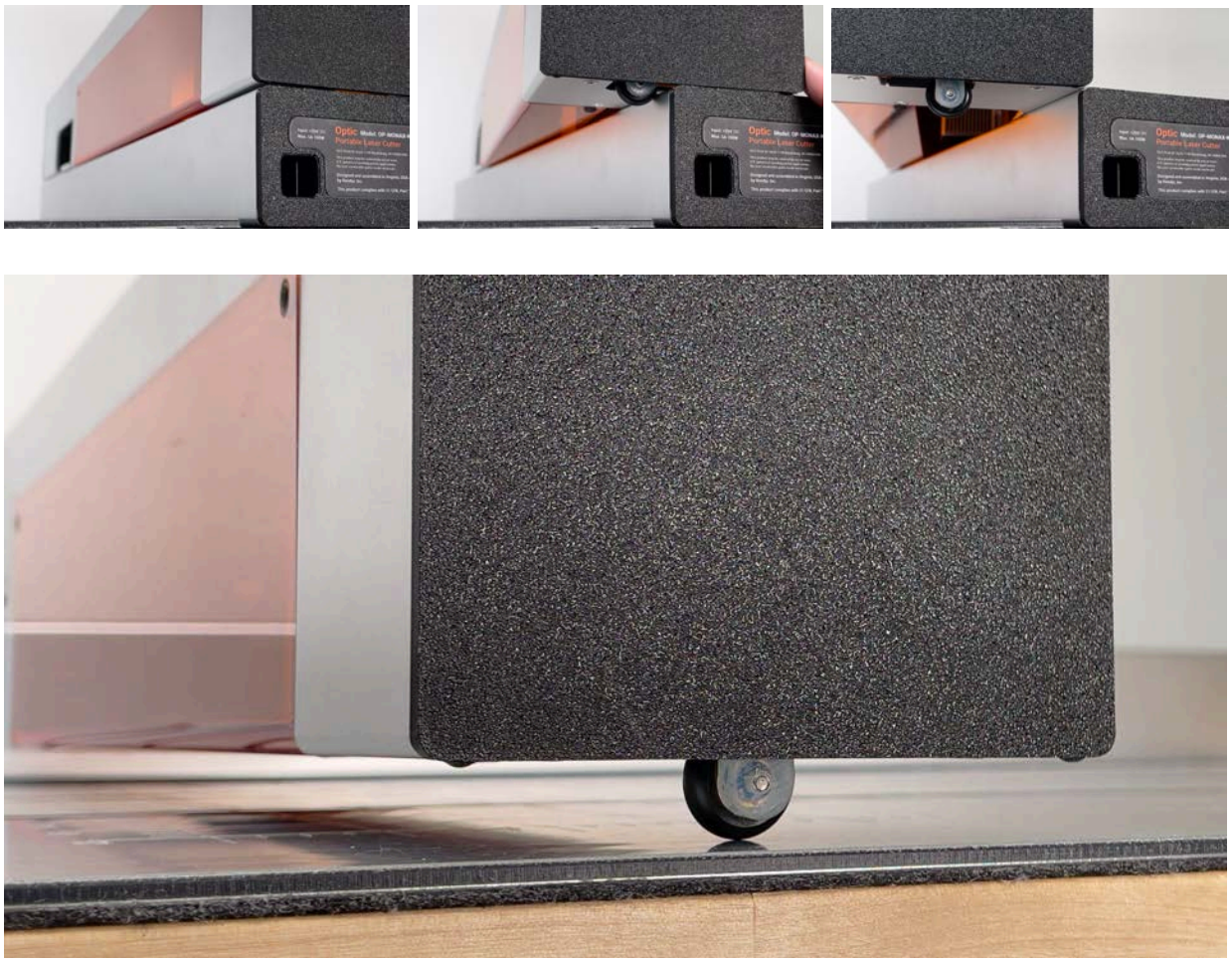


When seating the Optic down onto the hinge plate. Place a hand overtop the Optic's Hinge plate [as shown above] and add a little pressure down to guarantee the pins are seated.

5.3. Setting up the Support Leg

The Support Leg is stored in the Upper-Body, and will extend out when it clears the lower body.

© 2024 Rendyr, Inc.



The Support Leg allows the Optic to smoothly slide back and forth along the Y-Axis of the Optic.

Note: The Support Leg needs to be on a flat smooth surface. Ideally you shouldn't have the Support Leg traverse up onto your material or move across a large gap . Doing so may cause the leg to collapse or get caught on the edge of your material.

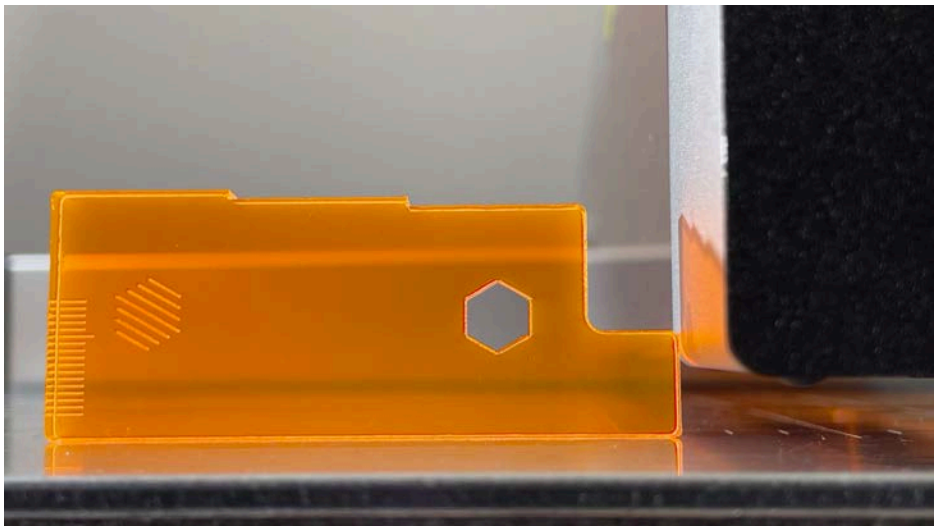
To return the Idler Wheel to its stored position when putting the Optic away, simply rotate the upper body back towards the lower body and slide it against the lower body surface to push it back into place.

Note: Before laser cutting any projects make sure the upper body is level by using the provided Height Gauge and Allen Wrench.

5.3.2. Leveling out the upper body

Prior to shipping all Optic's will be leveled out. In the instance that you need to level or re-level the upper-body follow the leveling instructions.

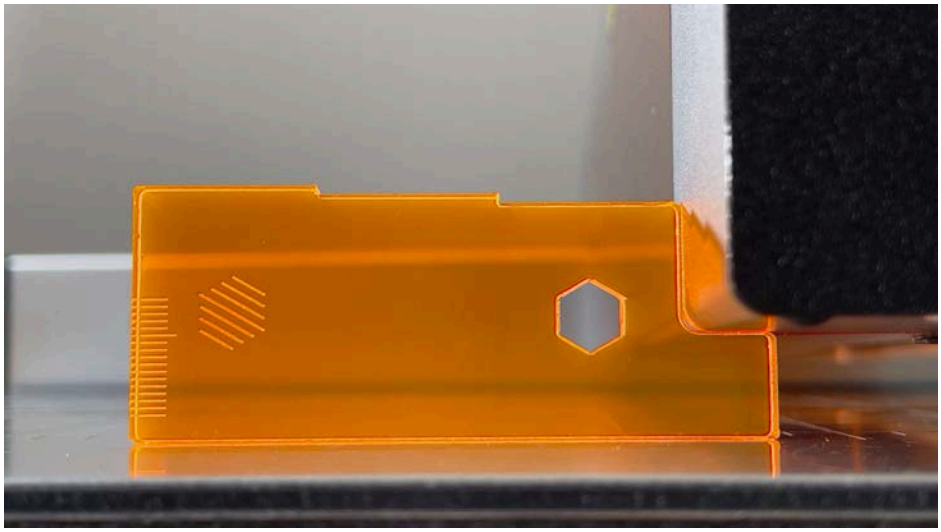
 © 2024 Rendyr, Inc.



Set the lowest setting of the Height Gauge under/beside the upper body.

Using the provided Hex Key adjust the upper body so it sits comfortably on the top of your height gauge.

 © 2024 Rendyr, Inc.



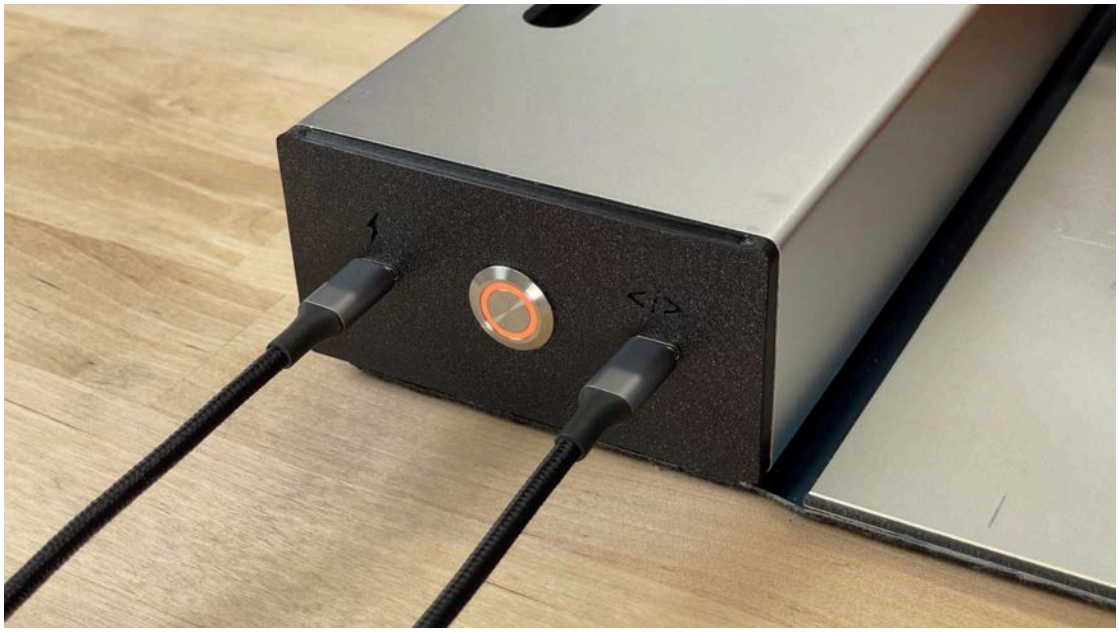
5.4. Connecting Power and Data

1. Plug the power adapter and one of the 6ft USB-C cables into the nearest electric socket or power strip.

2. Plug the other end of the USB-C cable into the left-side power connection port. An orange light will turn on signaling that the Optic is receiving power.

   [Wait for the orange light to turn on before plugging in the data cable.]

© 2024 Rendyr, Inc.



3. With the other 6ft USB-C cable plug one end into a connection port on your computer

4. Plug the other end of the 6ft USB-C cable into the right-side data connection port.

You will know the Optic is connected to LightBurn when in the Laser Control window you see the connection switch from “Disconnected” to “Ready”.

Note: If the connection doesn’t say Ready make sure that you see the Optic is selected and/or try changing the “COM” to the correct port.

It is very important to plug in/unplug the cables in the correct order. If you plug the cables in backward simply unplug and follow the instructions again.

 © 2024 Rendyr, Inc.

5.5. Connecting Laser Module

Note: Unplug the power running to the Optic before attempting to plug in/unplug the Laser Module.

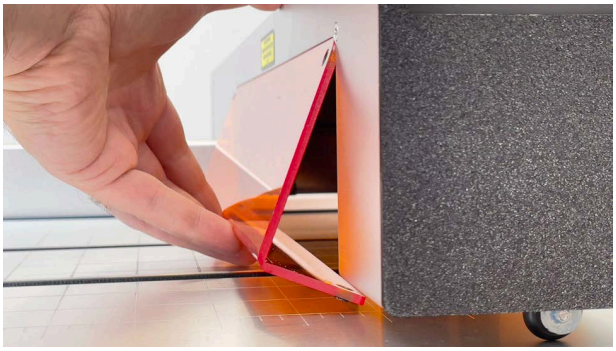
© 2024 Rendyr, Inc.

When installing the Laser Module, first connect the magnetic cable to the port on the Laser Module as shown above with the cable coming out of the Magnetic connector in the same direction as the arrow as seen in the photo below.

Lift up on the cam lever as shown above and set the back of the laser module against the backplate. The dovetail of the Laser Module will settle against the dovetail of the backplate. Lower the Cam Lever down to lock the Laser Module into place.

 © 2024 Rendyr, Inc.

5.6. Laser Safety Shield



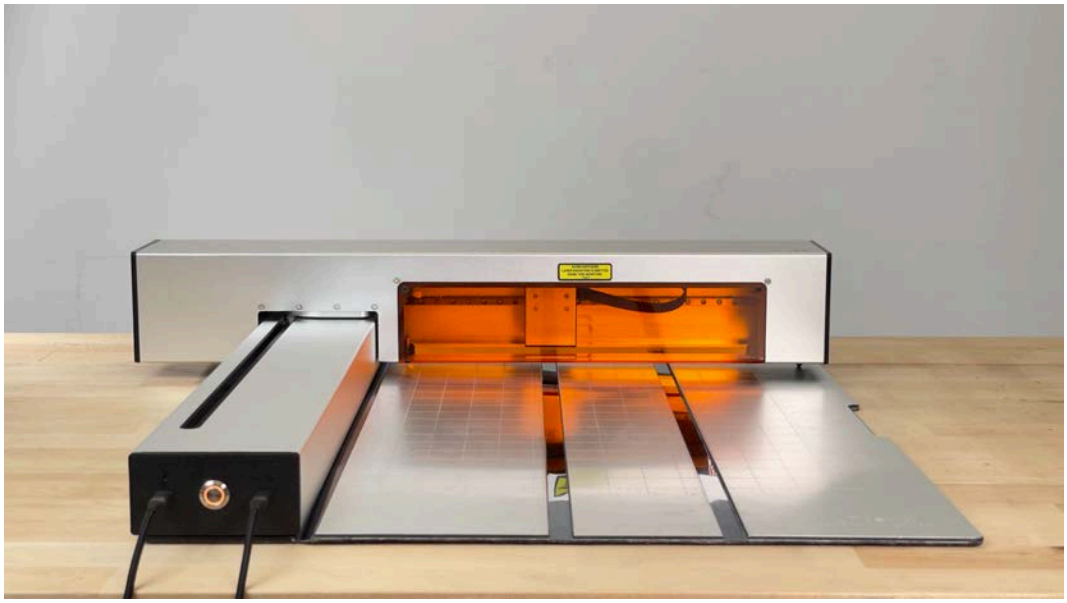
Place the safety shield into position against the upper body. Magnets connect and hold it in place adding a level of protection and triggering the Safety Shield switch allowing the laser to fire when in place.

Note: When the Optic is running and not firing the laser. Check the Optic's power button if you see an orange blinking light with a buzzer sound going off, then that will signify to you that the Shield isn't properly seated and the Safety Sheild switch isn't being triggered.

Stop the project you're working on and correct the seating of the shield before proceeding.

NEVER remove the shield and force the safety switch ON without the shield being in place!

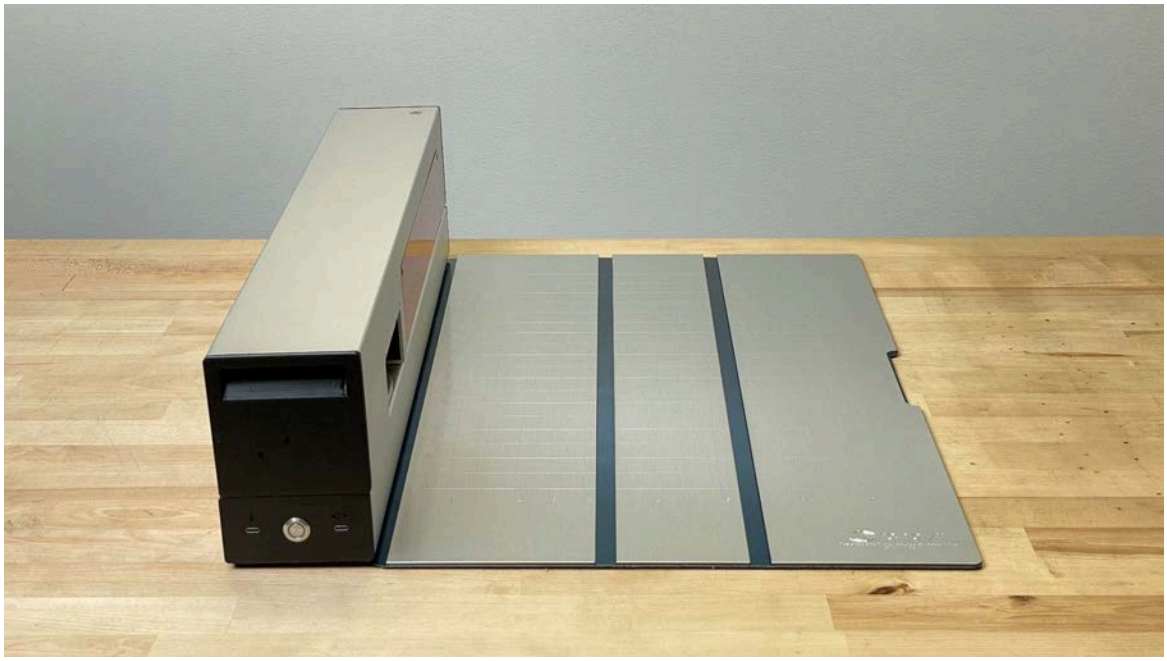
5.7. Finished setting up



© 2024 Rendyr, Inc.

After unfolding and connecting your Optic to LightBurn, you will now be in Standby mode.

5.8. Detaching the Cutting Mat

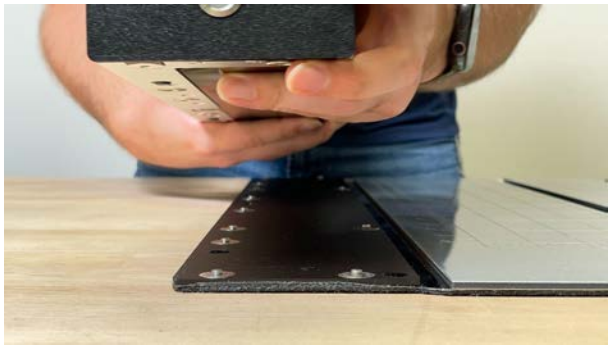


When you are wanting to laser cut or engrave on to materials/objects or create oversized projects sometimes you may want to remove the cutting mat to achieve your goal.

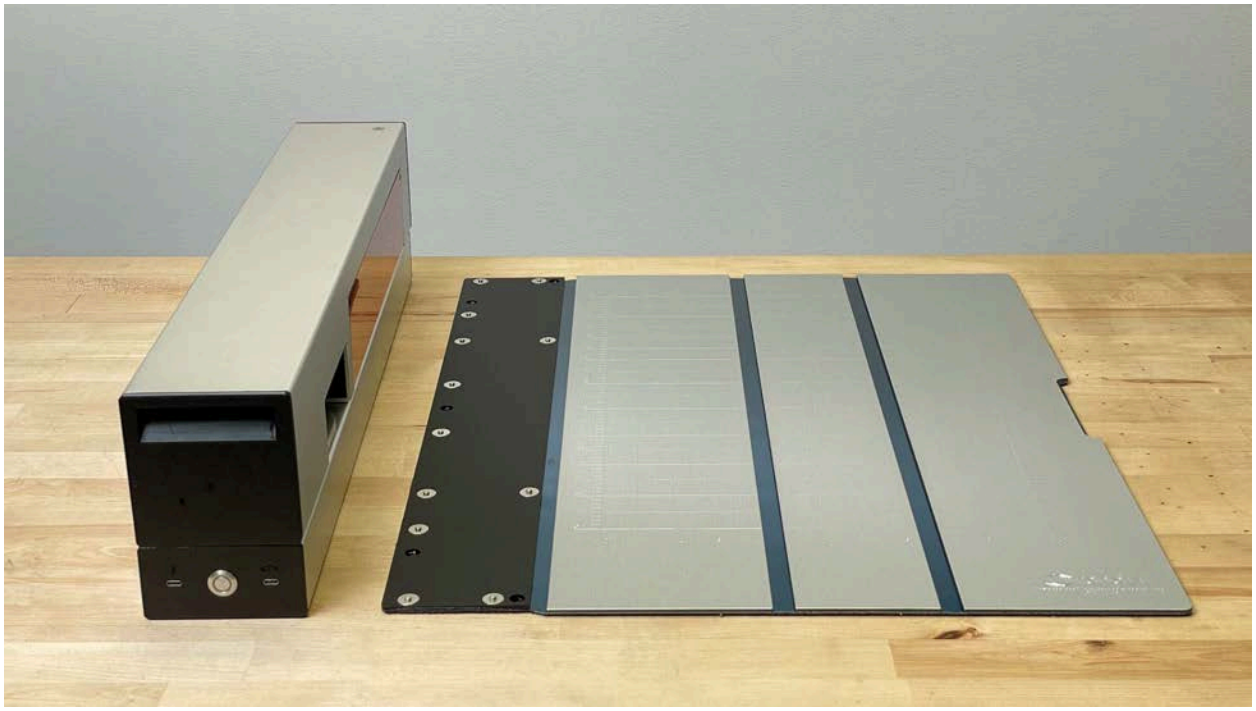
5.8.1. Remove Cutting Mat

 © 2024 Rendyr, Inc.

Grab the Optic from either side.



Magnets hold the Optic to the cutting mat. You will want brace the cutting mat down and lift up on the Optic so they separate.



5.8.2. Attaching the Cutting Mat

To attach the Optic back onto the Cutting Mat reverse the steps and align the Optic back onto the mat until you feel the magnets snap back into place.

 © 2024 Rendyr, Inc.

5.8.3. Operating the Optic without the Cutting Mat

With the Cutting Mat detached you can unfold the Optic and operate it as normal.

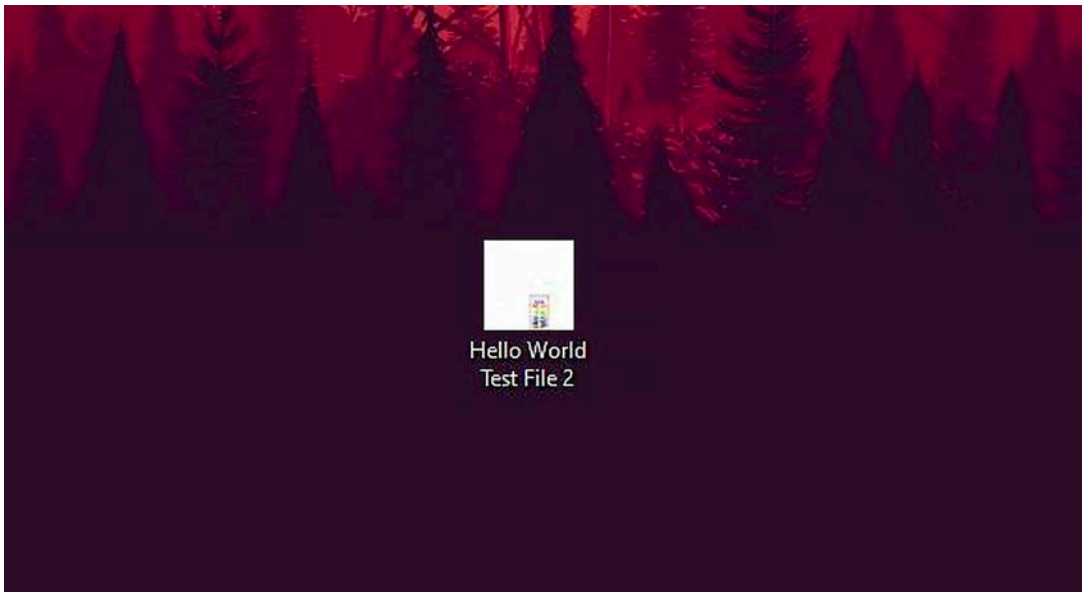
Note: Be cautious and aware as with the Optic detached from the cutting mat means the laser can potentially damage any material underneath what you are cutting, if the material you are cutting is thin.

© 2024 Rendyr, Inc.

6. Start to Finish | First Laser Cut with the Optic

When you have finished setting up your Optic and installed LightBurn with Rendyr's customized settings, we know you'll want to start laser-cutting and engraving all your future projects immediately. In this chapter, we will discuss and go over setting up your first laser cut project(s) and give some tips and techniques to assist you.

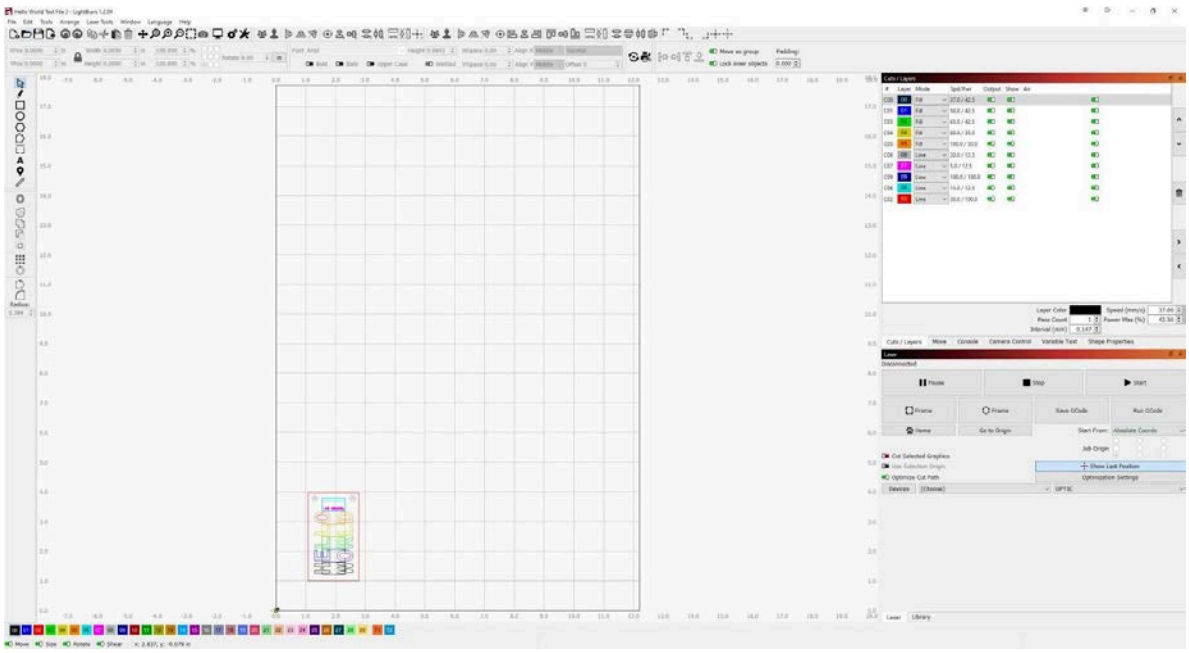
6.1. Open LightBurn File



Open the 'Hello World' Project you've downloaded from our website.

© 2024 Rendyr, Inc.

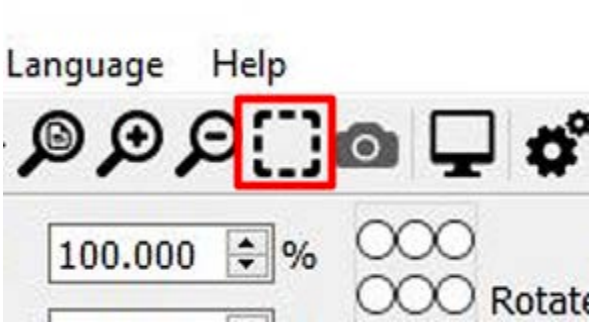
6.2. Review LightBurn Design



When the file opens, you will see some premade elements Rendyr has designed in the main workspace. In the Cuts & Layers menu, you will find more specifics about each layer, along with those color layers' customized speed and power settings.

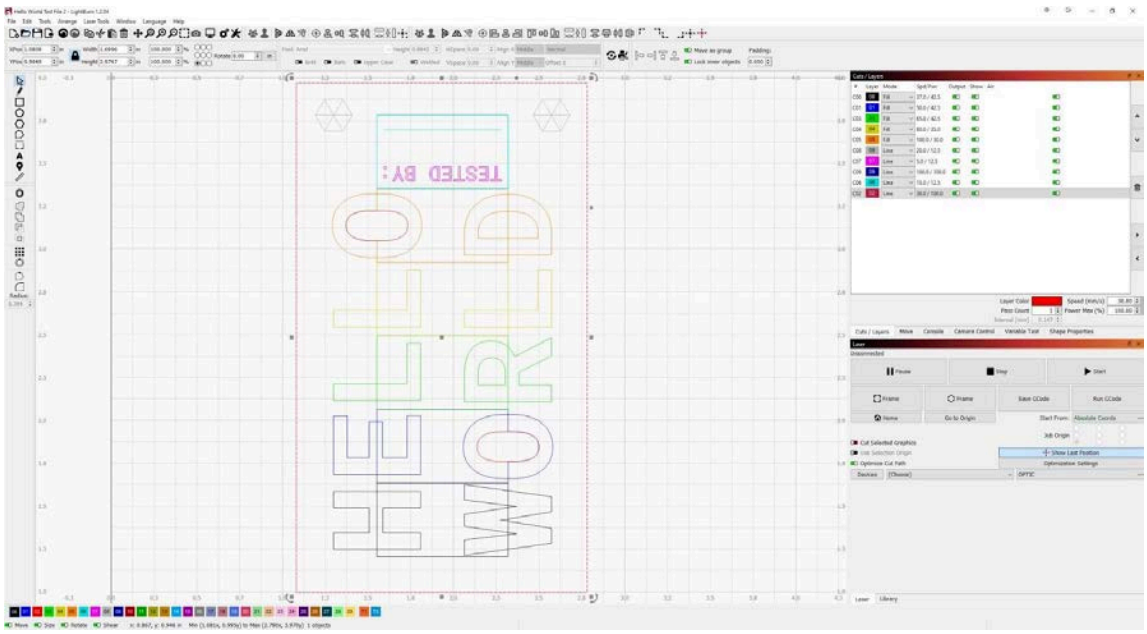
6.2.1

Zoom in closer to see the project in further detail. You have a few options for navigating and zooming in and out in the main workspace.



For this example, click the outer red rectangle layer and click on the “Zoom to Frame” selection button to quickly zoom into the project.

© 2024 Rendyr, Inc.



6.3. Adding your Name

To customize this project, we will show you how to install your name

6.3.1.

 © 2024 Rendyr, Inc.

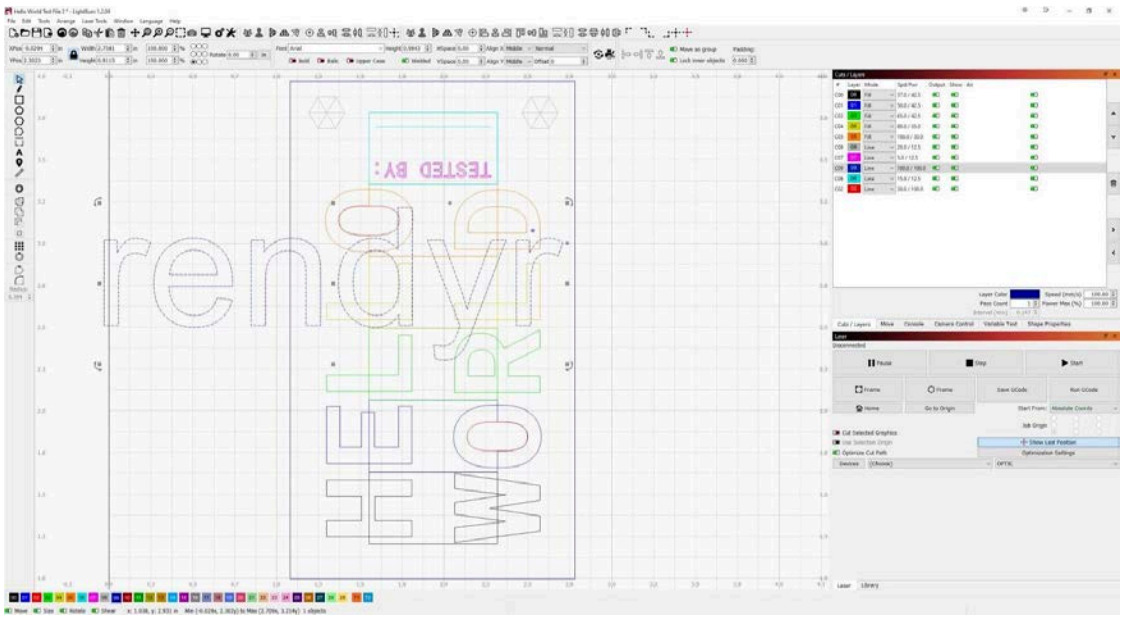
First, select at the bottom of your screen in the Color Palette menu, C09 Color

6.3.2.

Navigate to the left-hand side Creation Tools menu and select the Text tool.

© 2024 Rendyr, Inc.

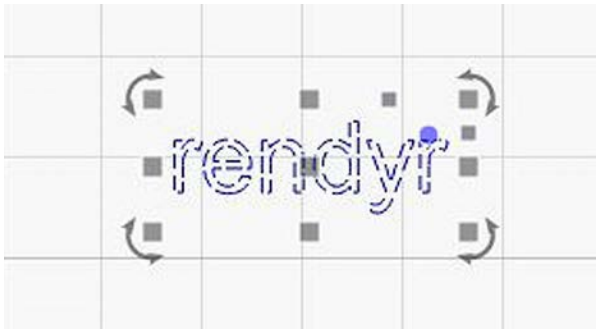
6.3.3.

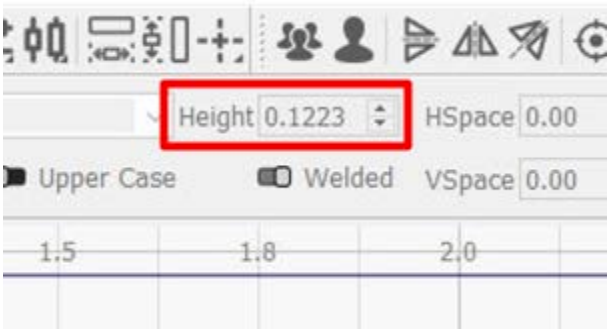


Move your cursor to the workspace and click on the window to begin typing. Type out your name. You'll see that while the layer is selected in the Cuts/layer menu C09 layer with be positioned above the C06 light blue layer. This is where we will want it to be when we laser-cut in a bit.

6.4. Positioning your name

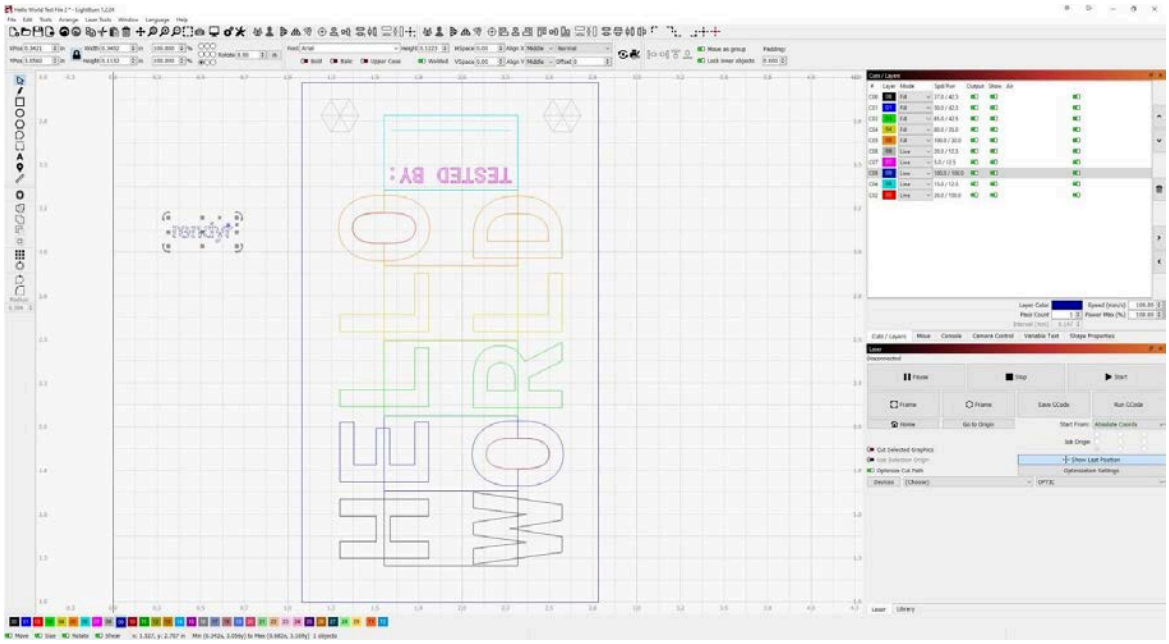
6.4.1



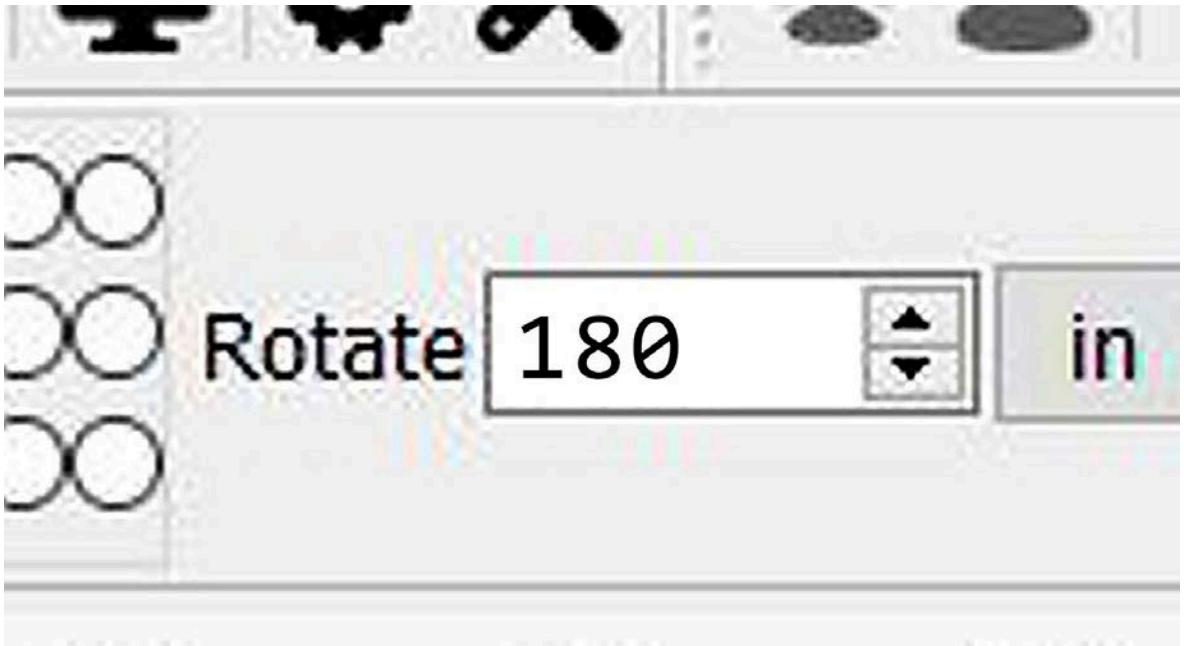


To begin positioning, select the "name" layer. In the main menu at the top, in the text, Height selection. Change the value to 0.1223inch / 3.11mm and hit Enter.

 © 2024 Rendyr, Inc.

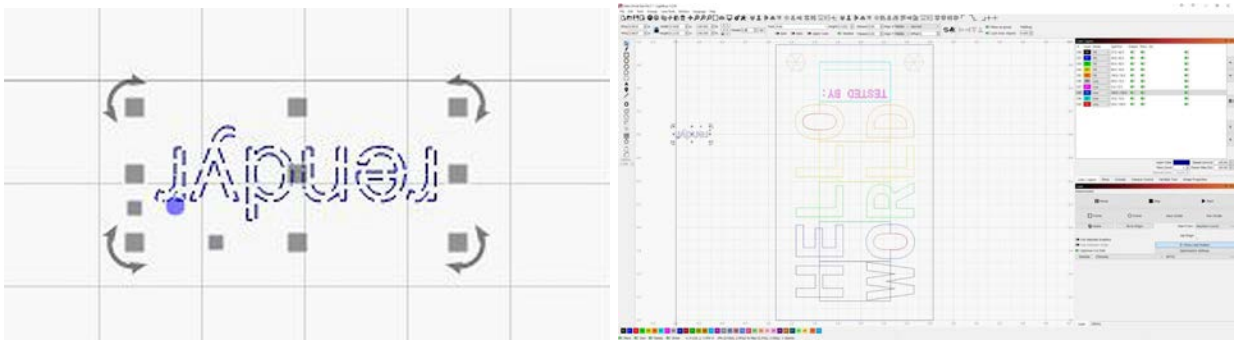


6.4.2

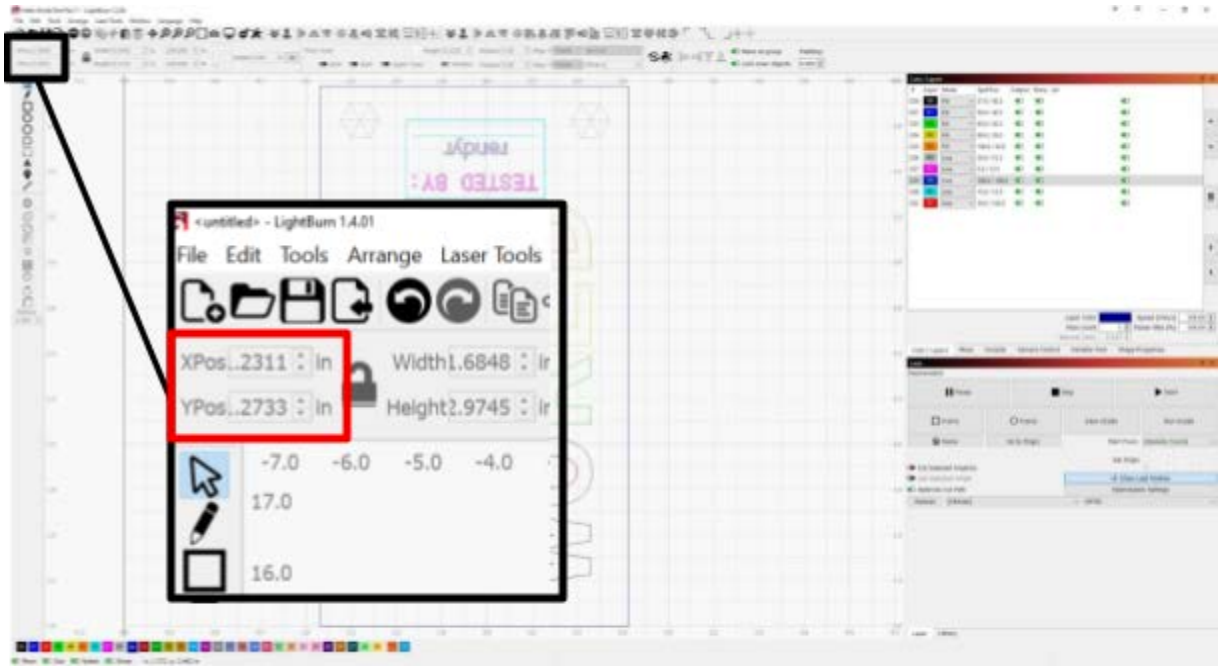


Next, change the value to 180 degrees in the rotation selection and click enter.

© 2024 Rendyr, Inc.



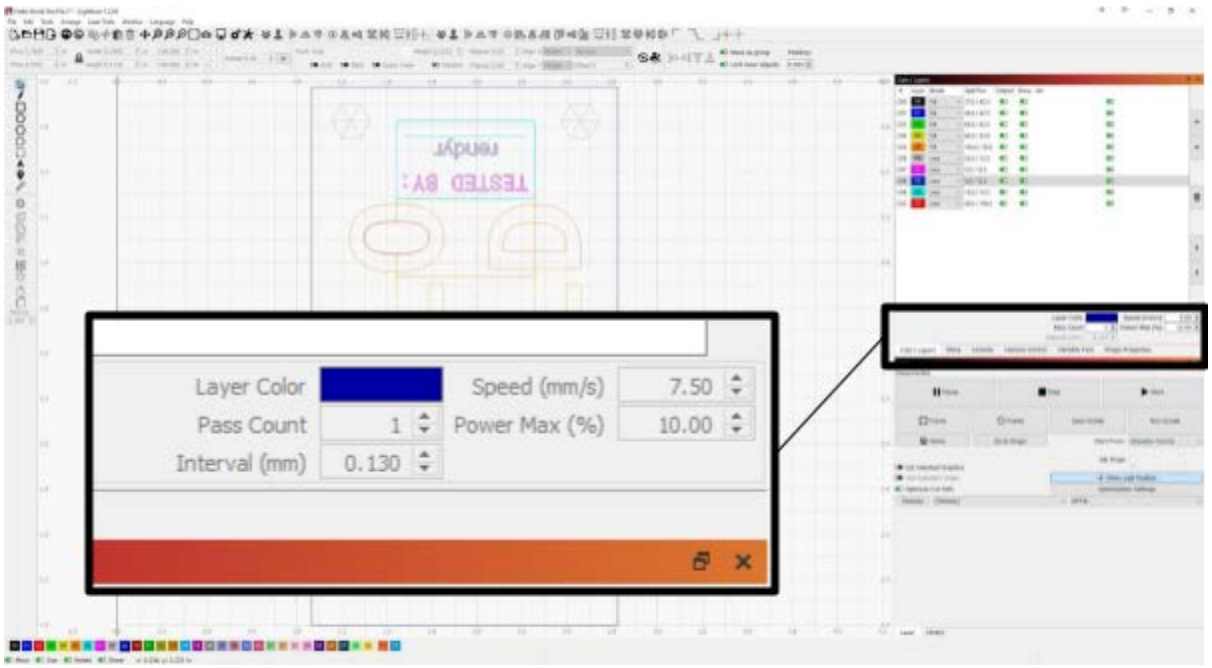
6.4.3



Click and grab the layer. Using your mouse position it under the “Tested By” text, just above the line. Another option is with the layer selected; navigate to the positioning menu in the top left of your window. You can manually type in **“1.8089inch” / “44.269mm”** for the XPos and **“3.6830inch” / “90.655mm”** for the YPos to precisely position your text.

 © 2024 Rendyr, Inc.

6.5. Change Layer Settings

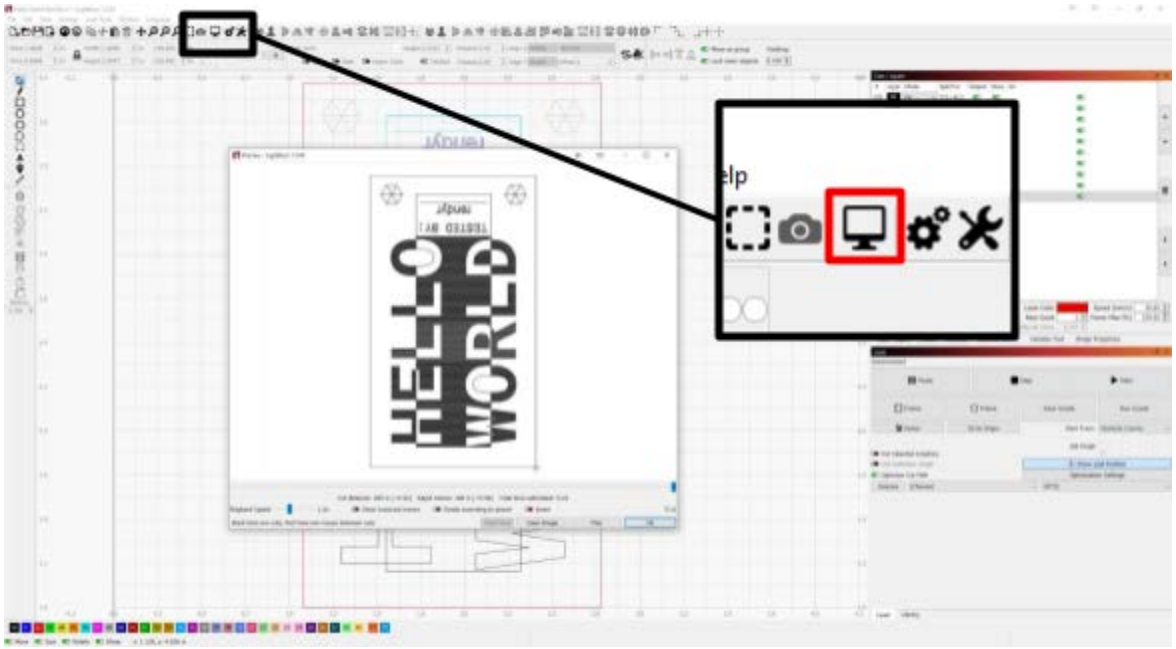


Navigate to the Cuts/Layers Menu with the text selected; double-click the layer to bring up the Cut Settings Editor. Change the settings to match what we have below to give you the best results for this layer.

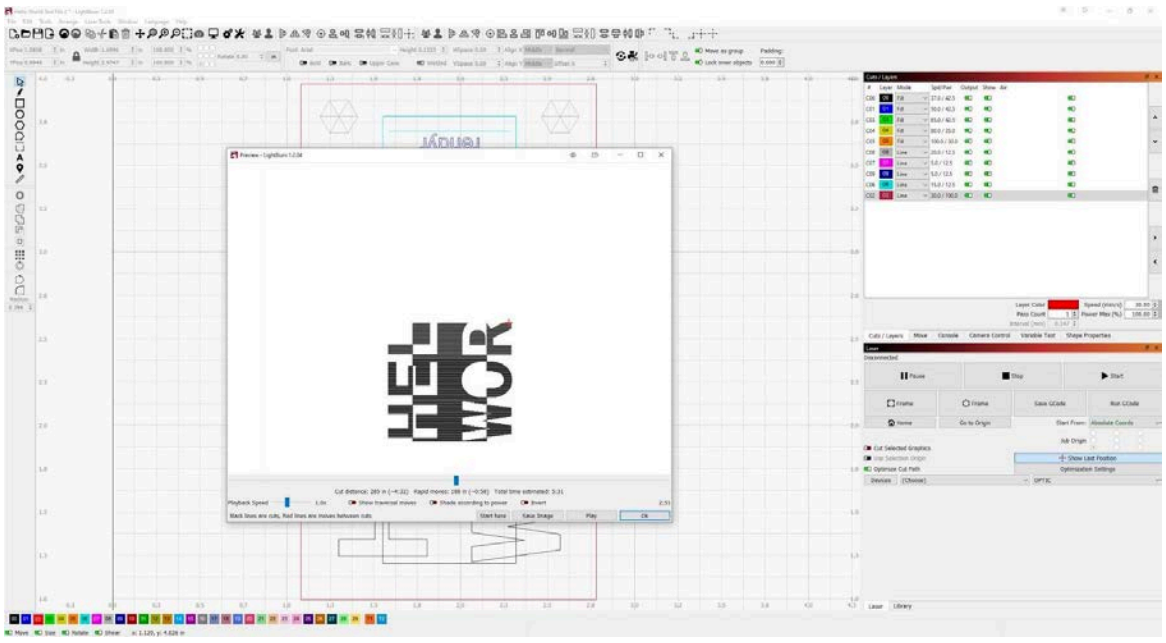
[Speed - 7.50
  Power - 10.00
  Pass Count - 1
  Interval (mm) - 0.130
]

 © 2024 Rendyr, Inc.

6.6. Check Preview



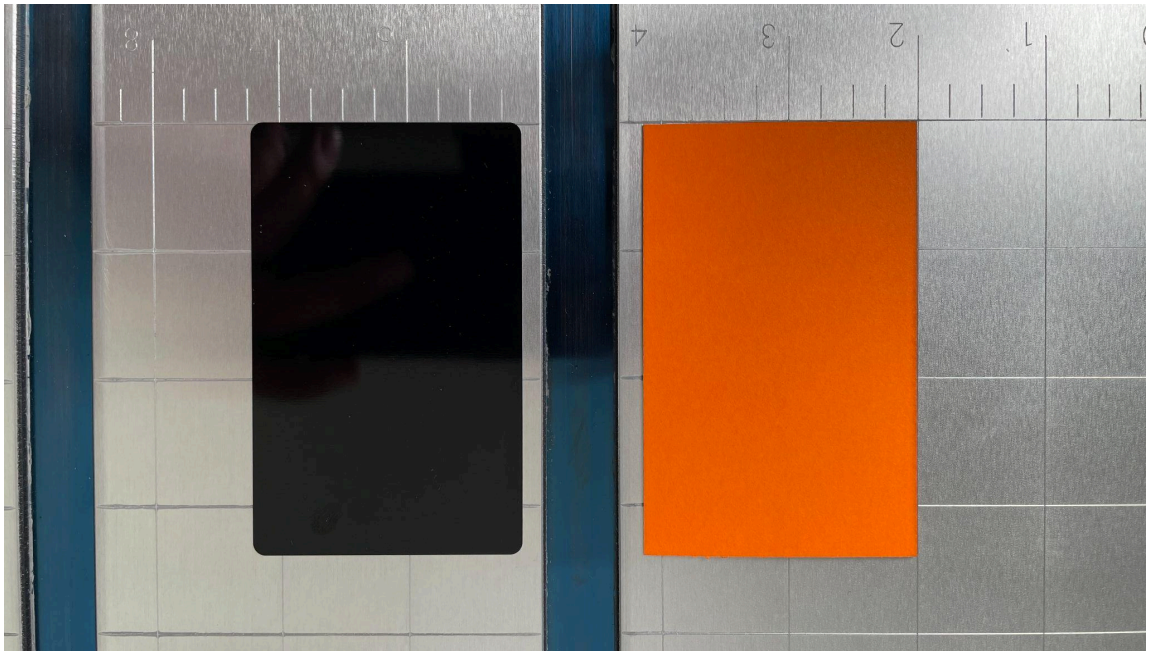
With everything in place, navigate to the top center and click the preview button. Check to ensure the preview shows the whole image, as seen below.



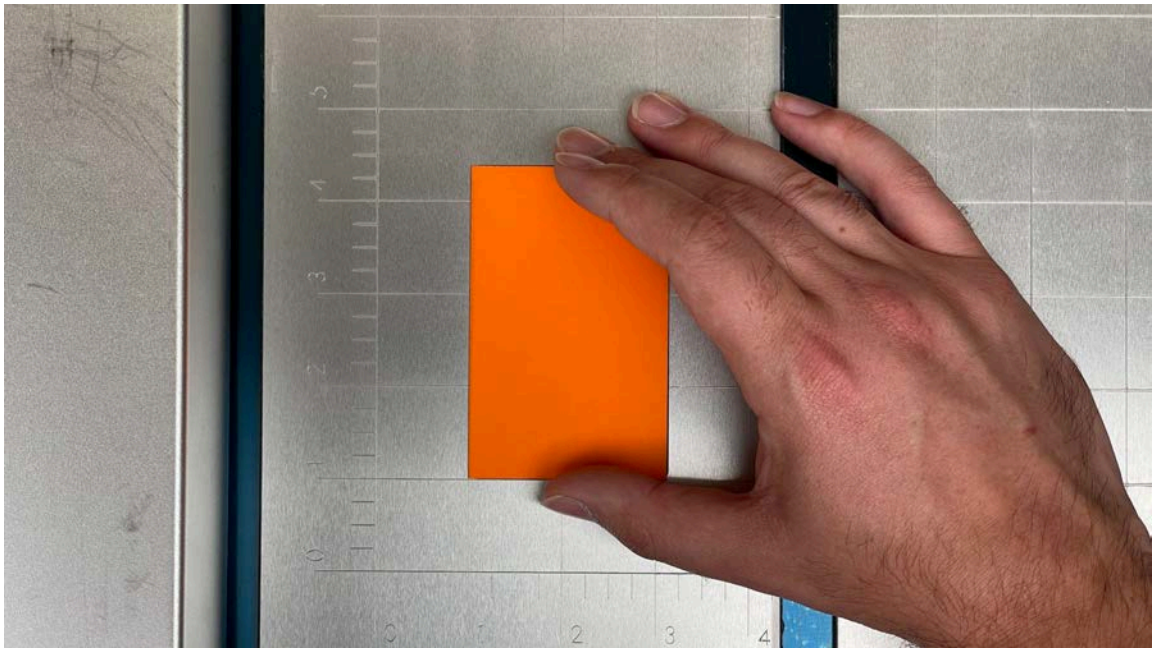
You will see the Cut duration, which will establish a time of around 5 min. You will also be able to scroll through to see how LightBurn will instruct the Optic to cut and engrave each layer. Click okay to close the window.

© 2024 Rendyr, Inc.

6.7. Positioning your material



With the Optic Portable Laser Cutter in stand-by mode, position the upper chassis (upper body) out of the way of the cutting area, so you have easy access to the entirety of the cutting mat. You will see on LightBurn's grid the project is located within the 1 inch to 3 inches on the X-axis and 1 inch to 4.5 inches on the Y-axis in the workspace.



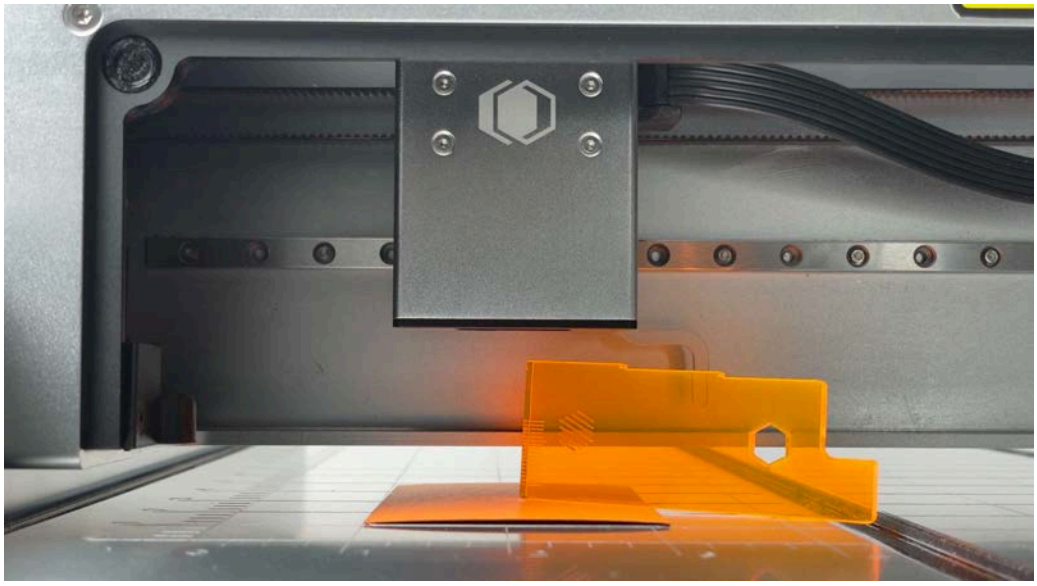
 © 2024 Rendyr, Inc.

Using LightBurn as your guide, take your material and position it in the same orientation on the 1-inch, X-axis, and 1-inch Y-axis of the cutting mat.

Note: You will notice the material does not align with the project file. The project file is set in a specific position, so when the Optic is cutting, the material which is positioned at x1, y1 has clearance on all sides. This reduces the chance of the laser going off the material and not giving you the final result we are looking for.

6.8. Laser Module Height Adjust

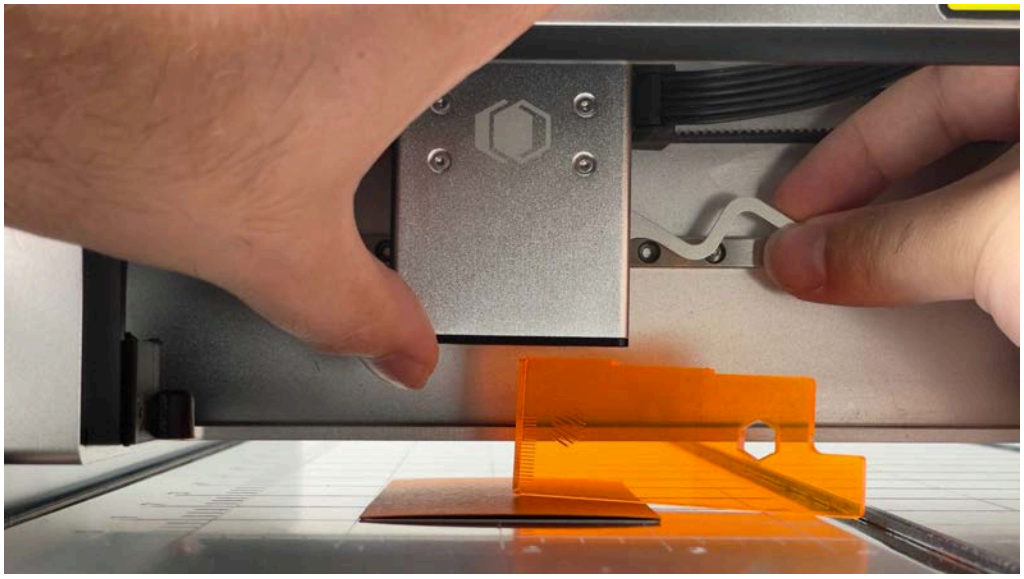
6.8.1.



Remove the laser Safety Shield and position the Upper Chassis (upper body), so the Laser Module sits directly above the material

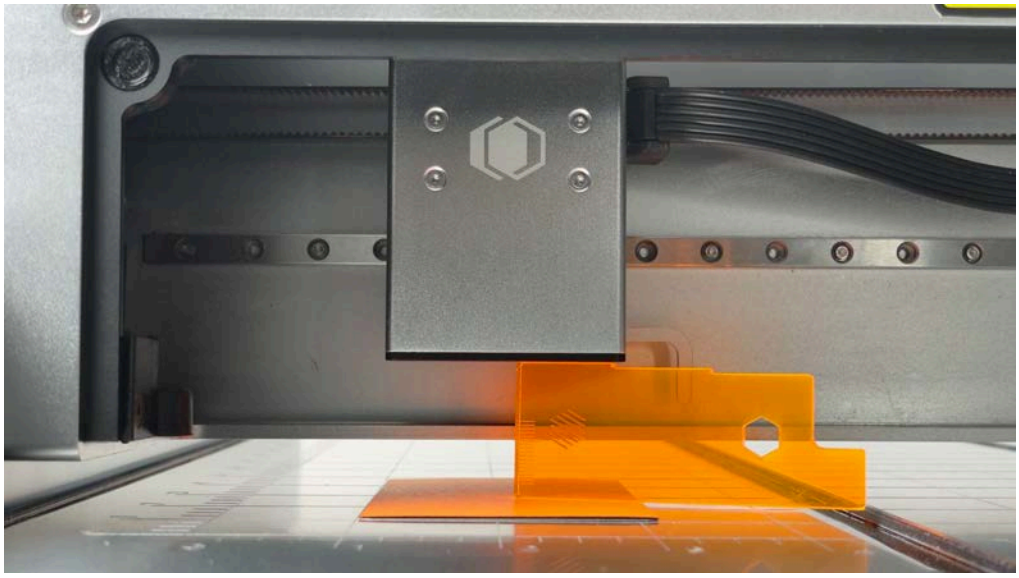
6.8.2.

 © 2024 Rendyr, Inc.



Take the Height Gauge and position it on top of the material and under the Laser Module.

6.8.3.



Release the Cam Lever and lower the Laser Module onto the height gauge (engraving level tallest level).

Note: The top of Height Gauge should touch the bottom of the Laser Module and have the room to slide back and forth easily as well as slide in and out from underneath without lifting the module or having to force it under.

© 2024 Rendyr, Inc.

Avoid putting pressure down on the cutting mat or module as doing so will change the focus distance of the module to the material.

[Refer to **Section 3.4 Accessories** for more information on the Cam Lever]

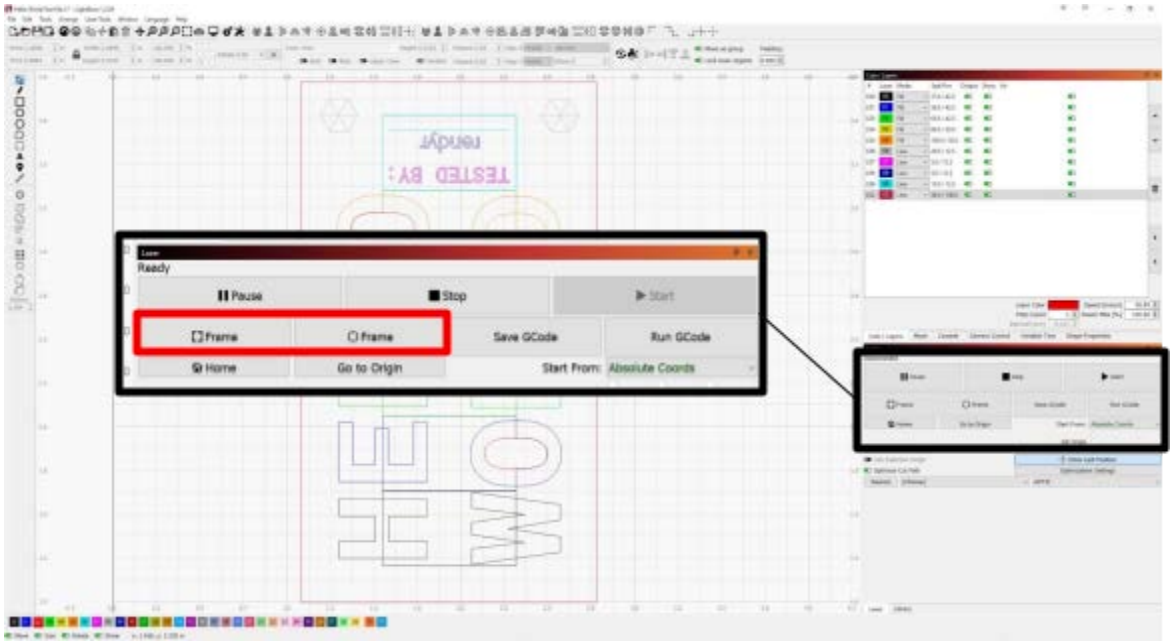
6.8.4.

With the Laser module set to the correct height, lock it in place by lowering the Cam Lever back down and placing the Safety Shield back into place.

Double-check your material's position on the cutting mat. Press the Power Button (Orange to Blue Light) turning on the motor drivers

You can also check your material's position by pressing the Frame button in LightBurn, which will outline the cutting area. (Must have the Optic in Active mode) **See section 6.9 Framing your Project**

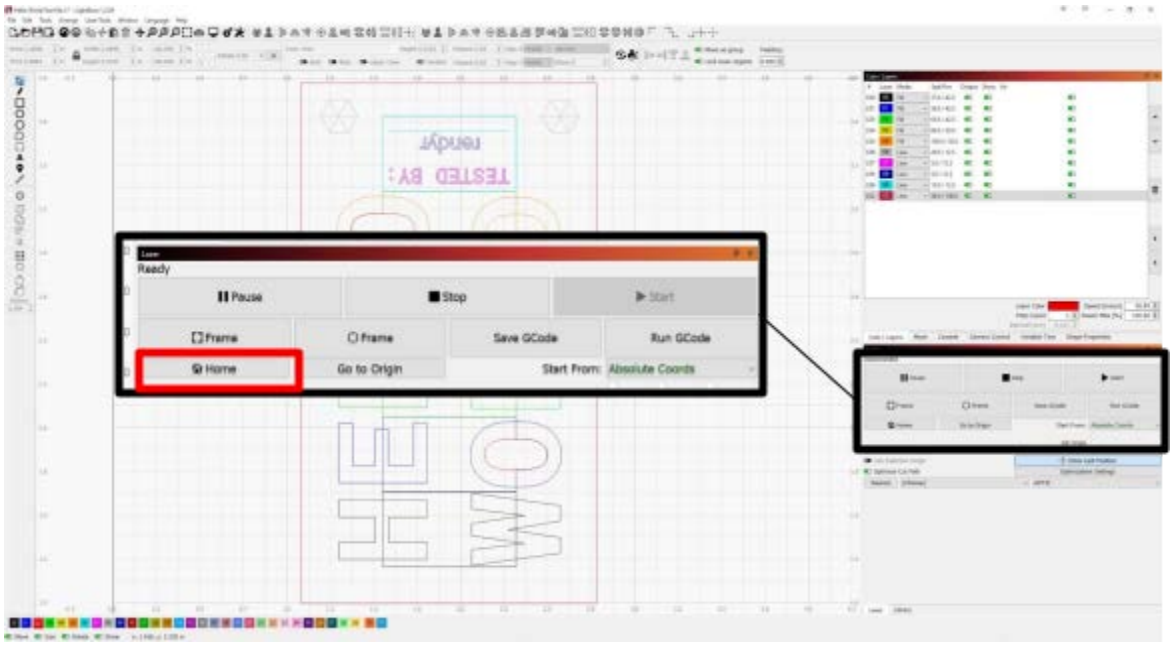
6.9. Framing your Project



When you need to check your materials position. You can use the frame tools. See LightBurn Framing Instructions for more information. For our purposes, we will be using the Square Framing tool also known as the "Bounding Box".

 © 2024 Rendyr, Inc.

6.9.1

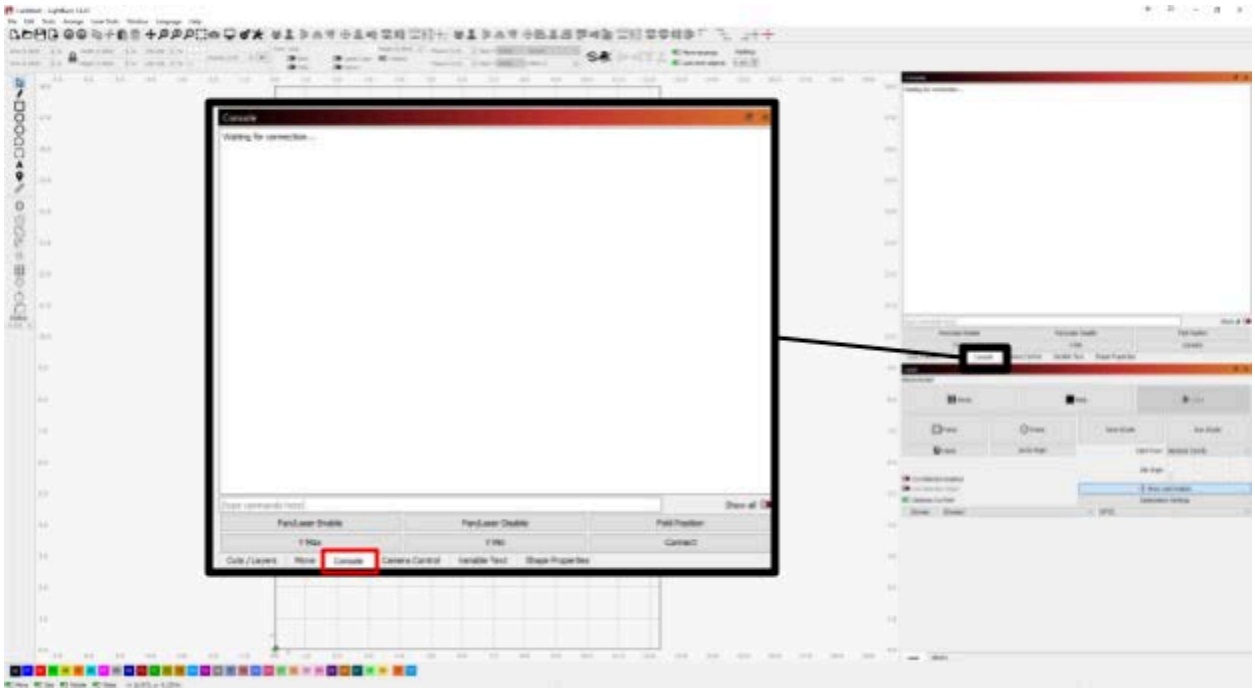


To start press the power button so the **Blue Light** is showing and the drivers are active. You will need to next **Home** your Optic by clicking the Home Button.

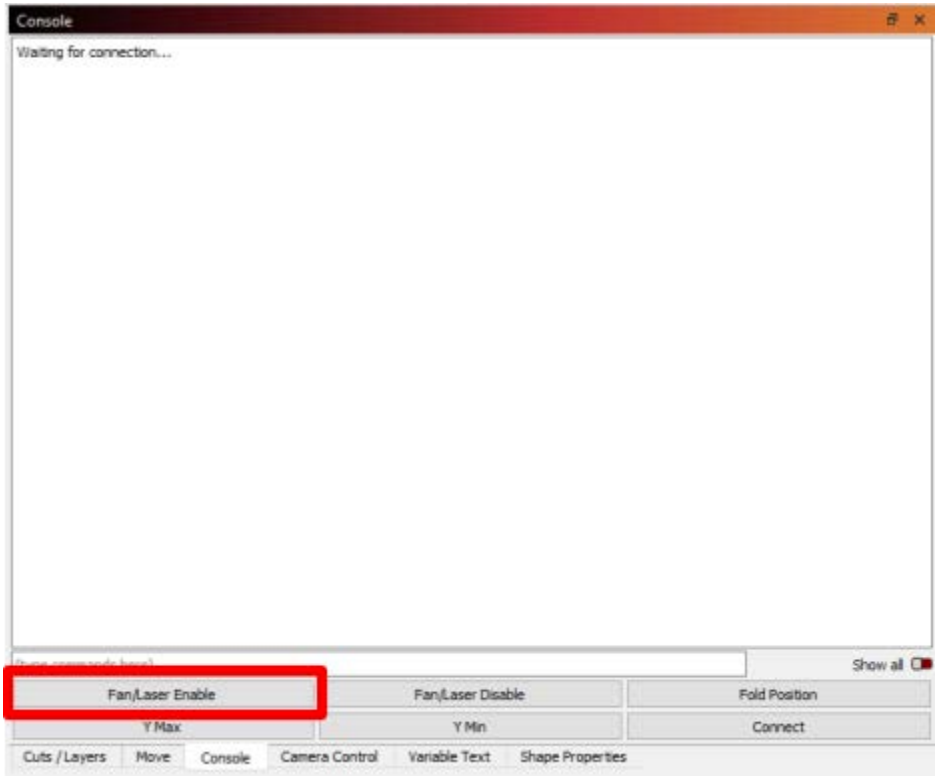
Note: If you don't **Home** your Optic before framing or in general before a cut, LightBurn will assume you wish to go off its current point of origin and will begin cutting from where its current location is on the cutting area.

© 2024 Rendyr, Inc.

6.9.2



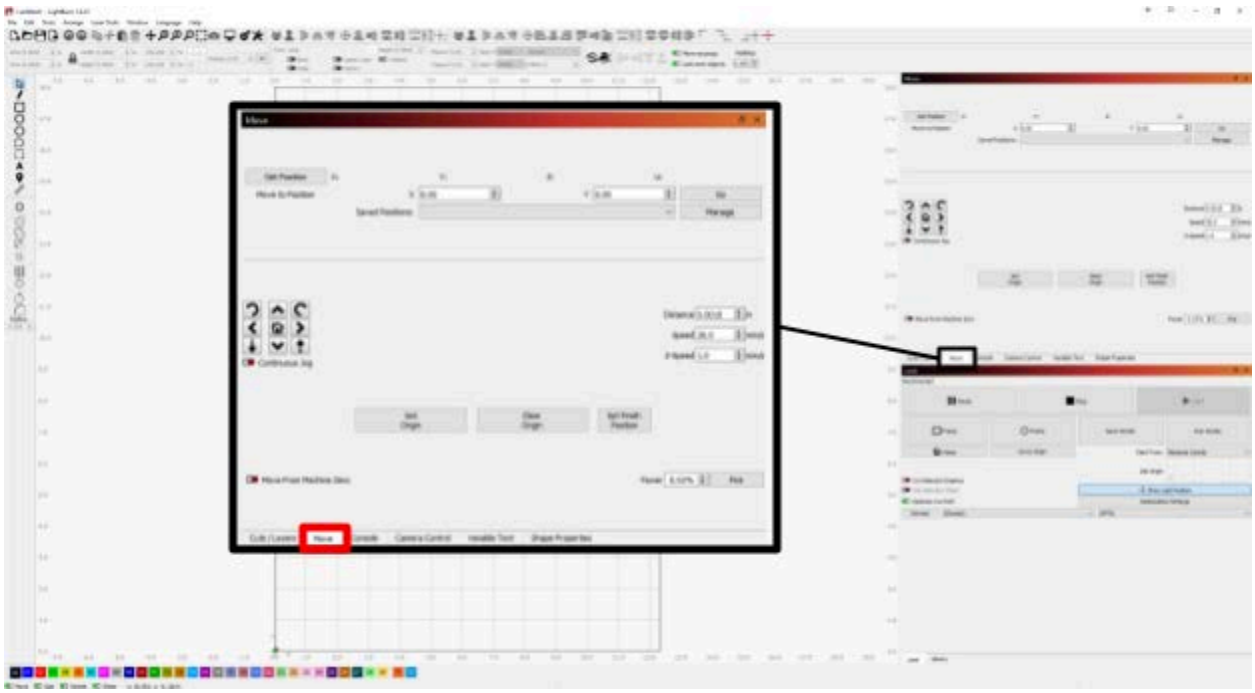
You will need to switch tabs from **Cuts/Layers** to **Console.**



 © 2024 Rendyr, Inc.

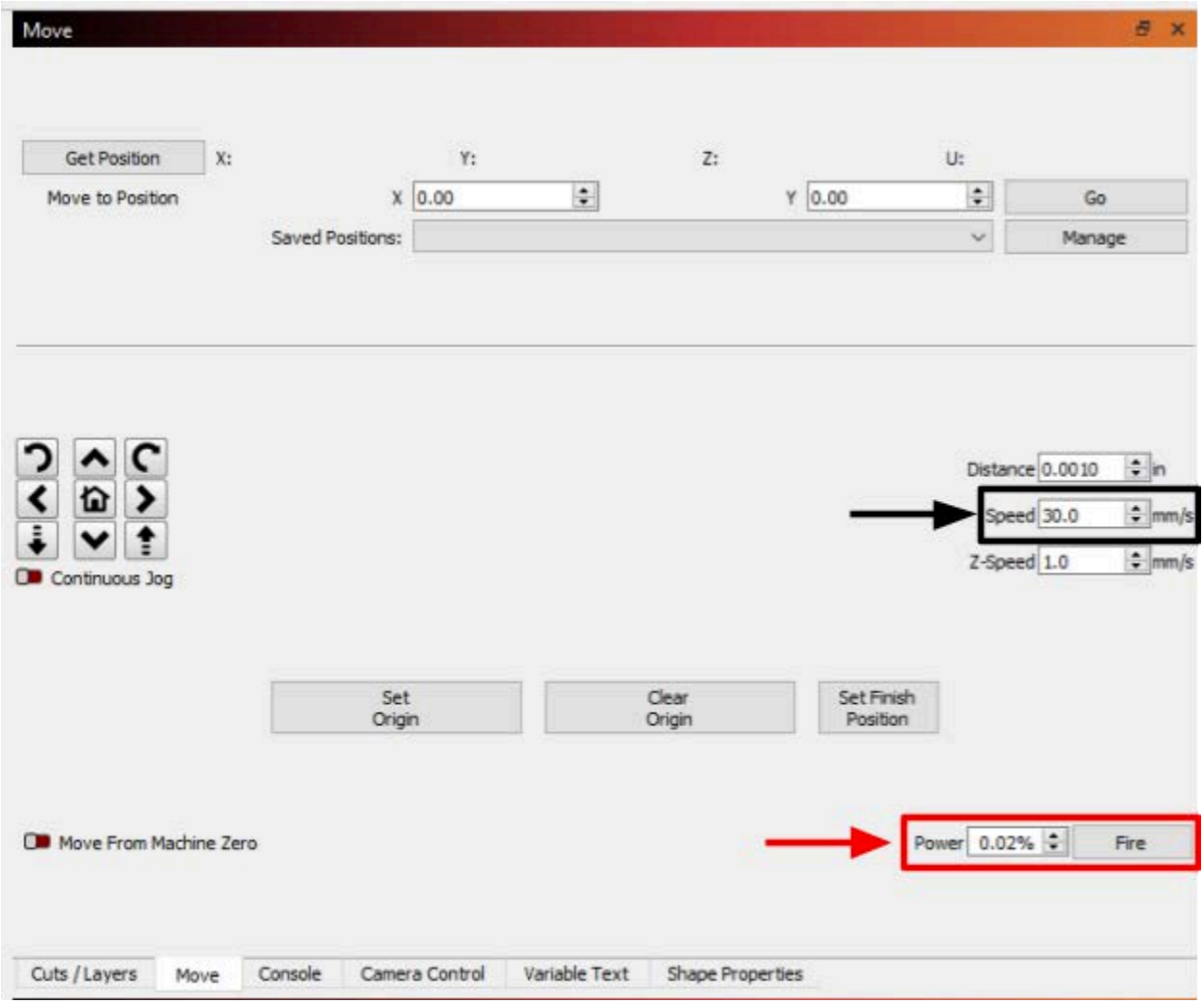
Click Fan/Laser Enable. The Optic fans will turn on.

6.9.3



With the Fans turned move to the **Move** tab.

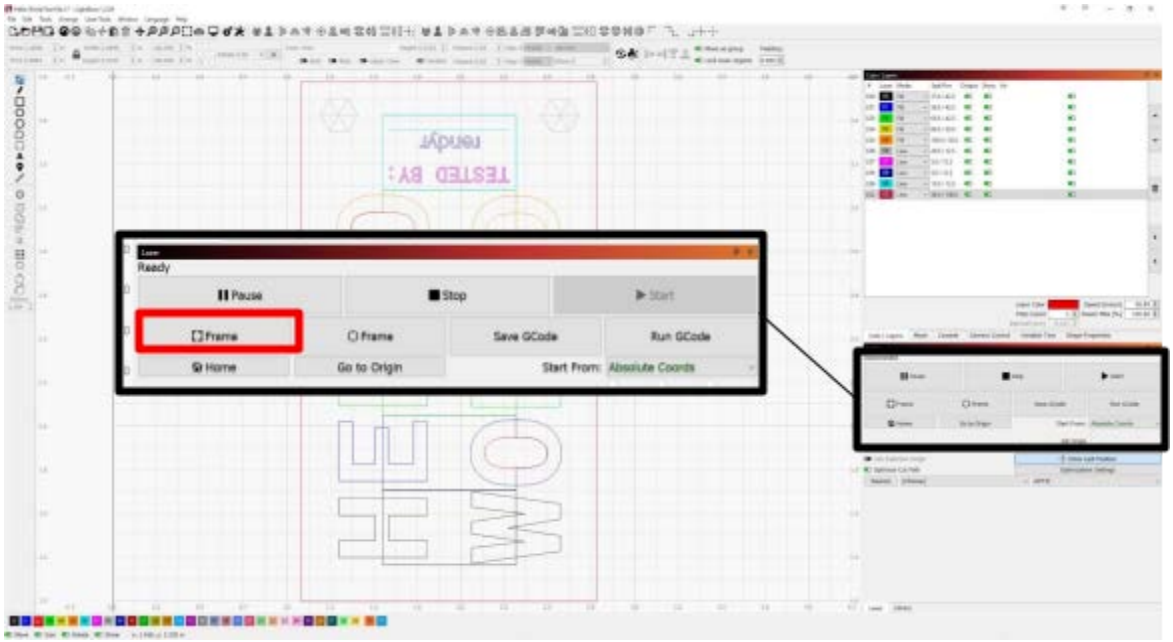
© 2024 Rendyr, Inc.



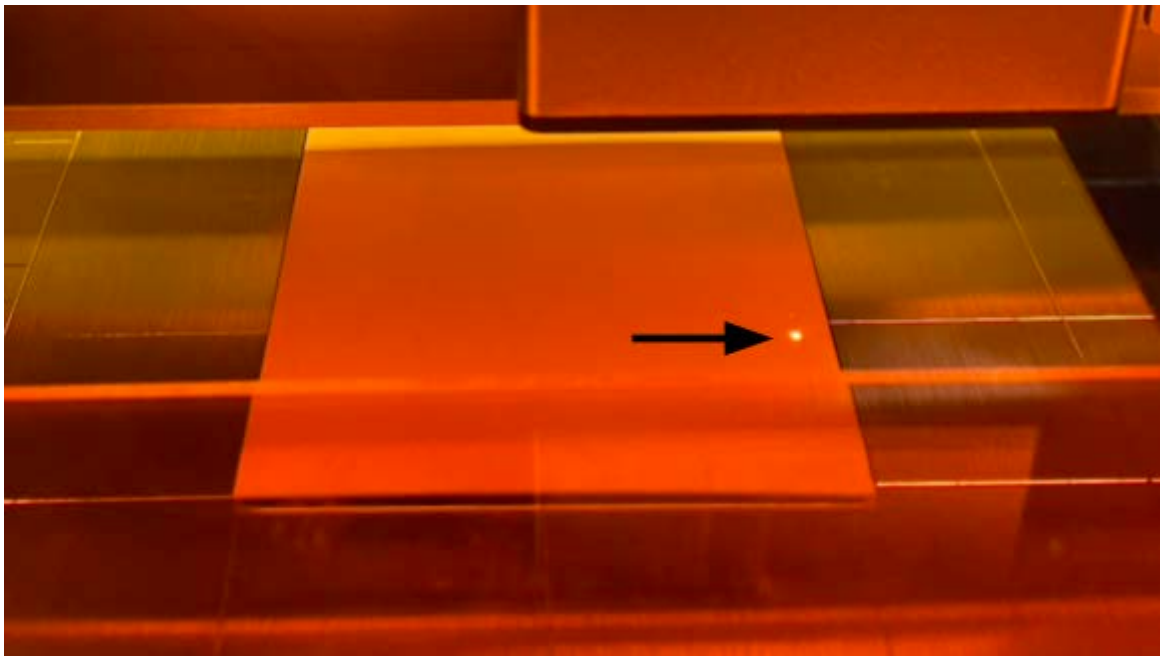
In the Move tab, make sure your speed is set to 30mm/s and power is set to 0.02%

6.9.4

 © 2024 Rendyr, Inc.

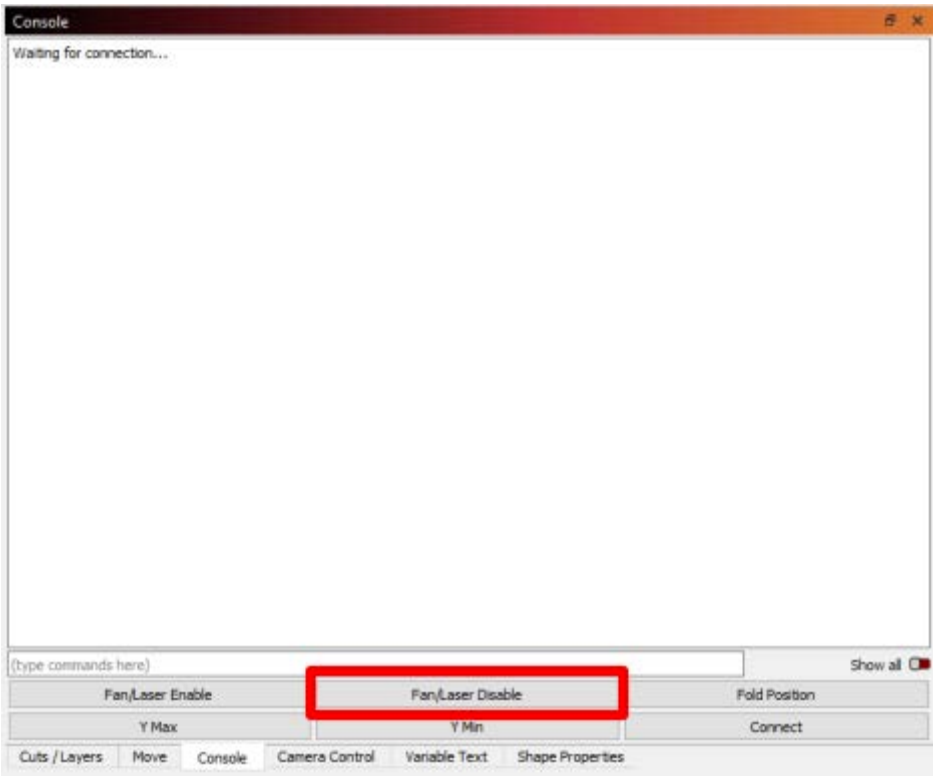


Switch back to the **Cuts/Layers tab.** With the Fans turned on, and Optic Homed, click Frame.



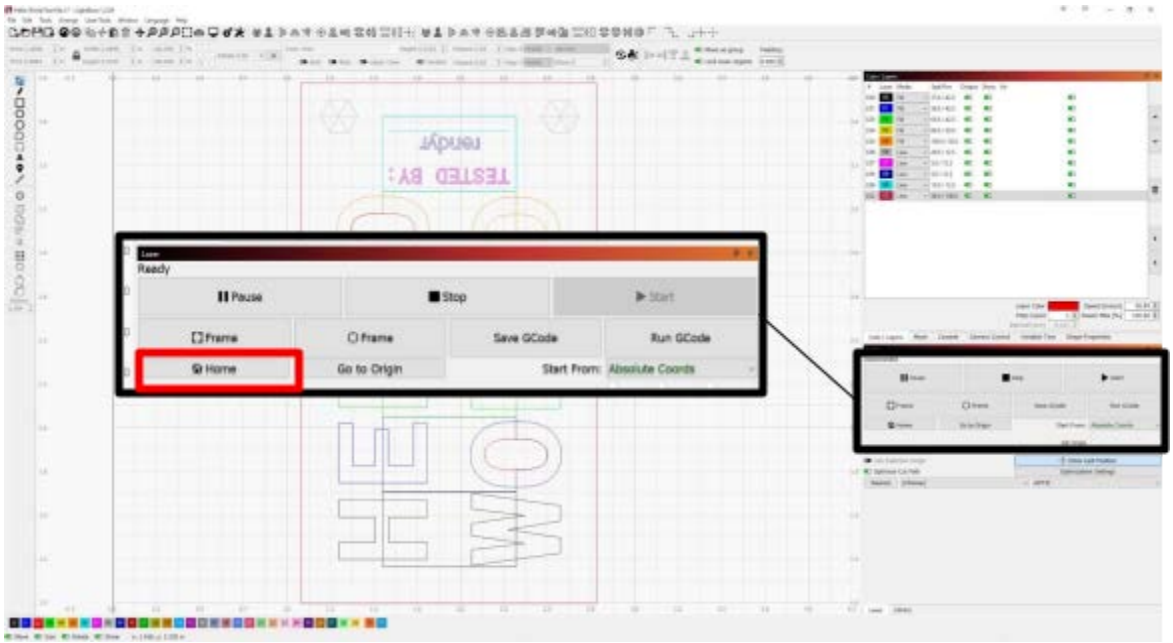
The Optic will outline the cutting area to guarantee your material is placed correctly on the cutting mat.

 © 2024 Rendyr, Inc.



Turn off the Optic fans by going back into the **Console** tab and click **Fan/Laser Disable**.

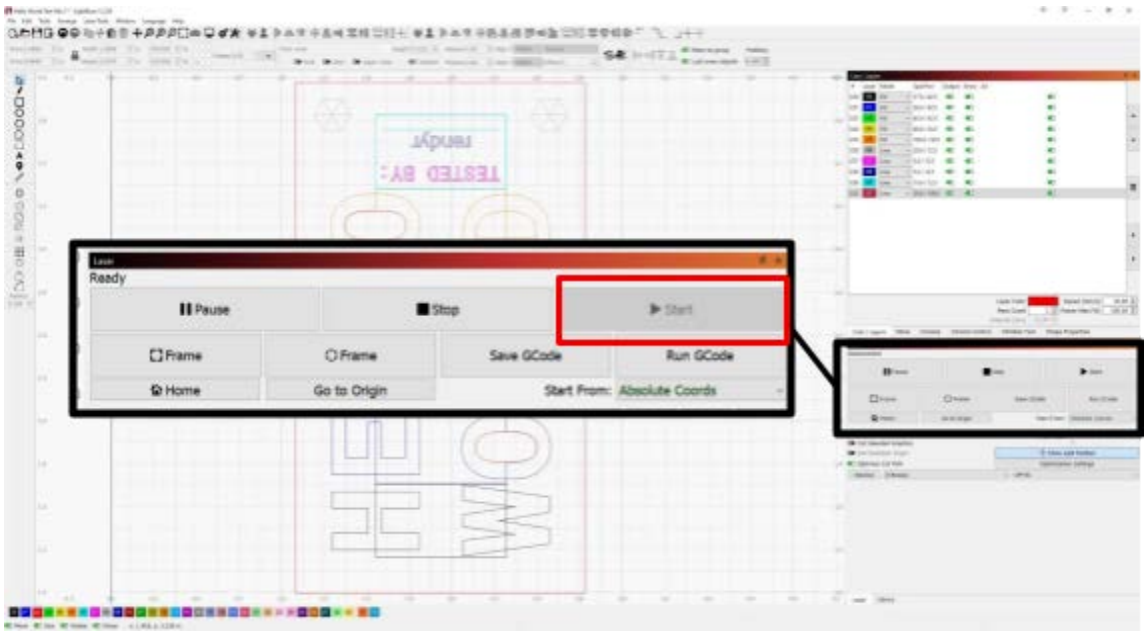
6.10. Starting your Cut



 © 2024 Rendyr, Inc.

6.10.1

In LightBurn, navigate to the Laser Controls Window and click the home button to home the laser.



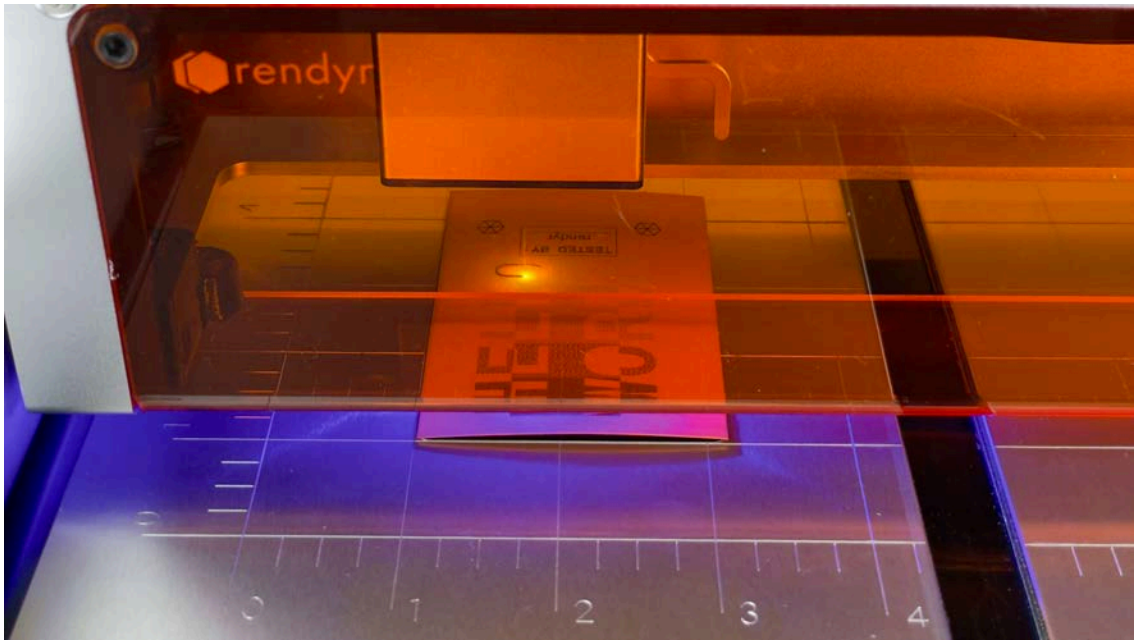
6.10.2

With the laser homed, you can begin your laser cut. Click the Start button to begin. The Optic's internal exhaust fans will power on, and the laser will fire.

[**Note**: Always stay vigilant when the laser cutter is running. If you need to walk away from the laser, you can always pause the Optic by clicking pause in LightBurn and, when you return, press the start button once again to resume. If an issue occurs, press the stop button to halt all further actions so you can fix the problem before continuing.]

[**Safety Reminder: Make sure you are being safe. Remember to wear your Laser Safety Glasses whenever the Optic is running. Make sure if others are in the area to have them put on safety glasses as well, or have them not look in the direction of the laser until the Optic is finished running.]**

© 2024 Rendyr, Inc.



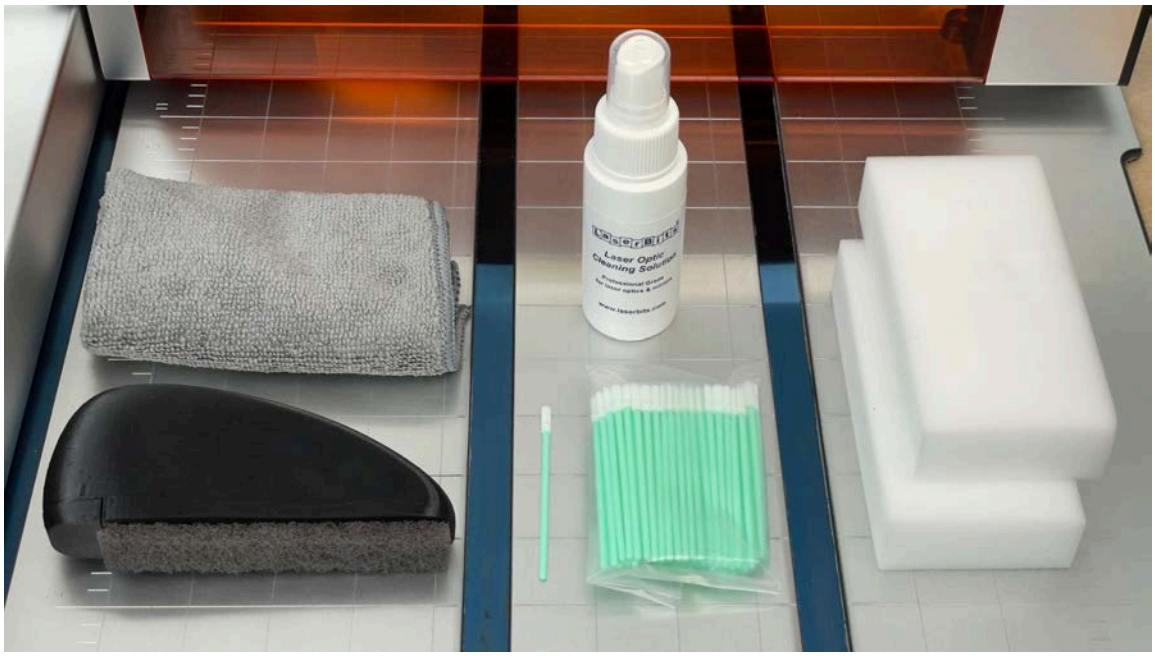
6.11. Finishing and Showing Final Results

When the Optic has finished its cut, the Optic's internal exhaust fans will slow and stop automatically. (**Wait for the Optic to stop completely before proceeding**). Press the Power Button to switch the Optic back into Standby mode. Push the Upper Chassis (upper body) out of the way to have clean access to your cut-out project. With that, your Hello World cut-out is finished.

 © 2024 Rendyr, Inc.

7. Cleaning & Aftercare for the Optic

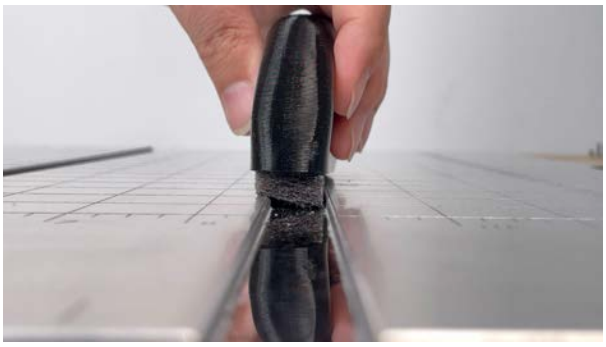
7.1. Cleaning Kit



After using the Optic Portable Laser Cutter it is important to clean your machine. Doing so will ensure your machine continues running and functioning properly and without issue.

7.2. Cleaning the Cutting Mat

7.2.1.



To clean the hinge areas, we have included a **Cutting Mat Hinge Brush**, which can scrub the hinge sections. Doing so ensures nothing impacts or obstructs your materials for future designs and projects. It's important to also scrub the sides where debris/soot could collect after cutting materials.

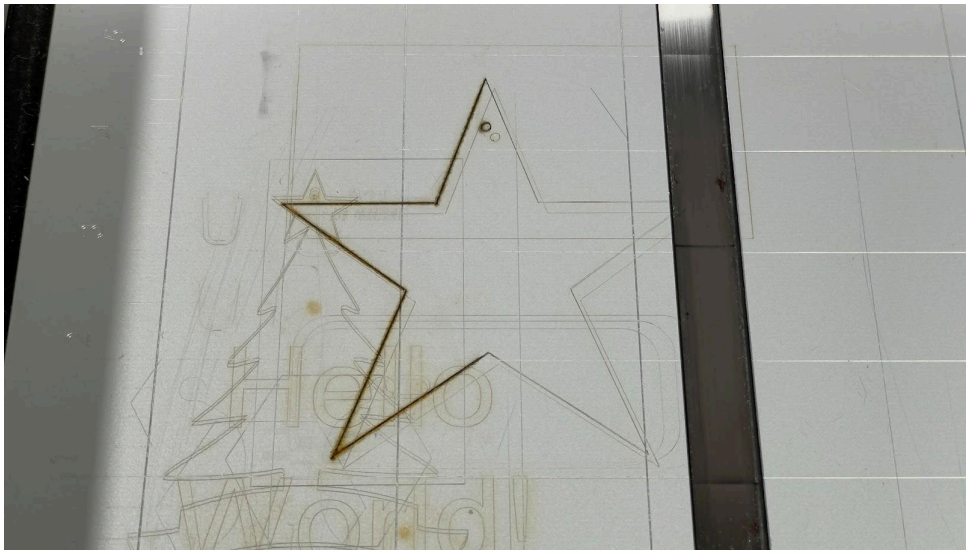
© 2024 Rendyr, Inc.

Wipe the hinge sections afterward with a paper towel. (Spray the paper towel with WD-40 for best results to prevent rusting)

7.2.2.

[Magic Eraser Sponge]

 © 2024 Rendyr, Inc.



Depending on the material, thickness, and duration of cutting, you may need to clean the cutting mat of any debris and potential burn marks where the laser pierced through your material and was making contact with the Cutting Mat. For the majority of the cutting mat, you can take the magic eraser sponge that has been dampened with water and wipe the cutting mat thoroughly.

Wet a paper towel with isopropyl alcohol or water and wipe the area to clean the cutting mat further.

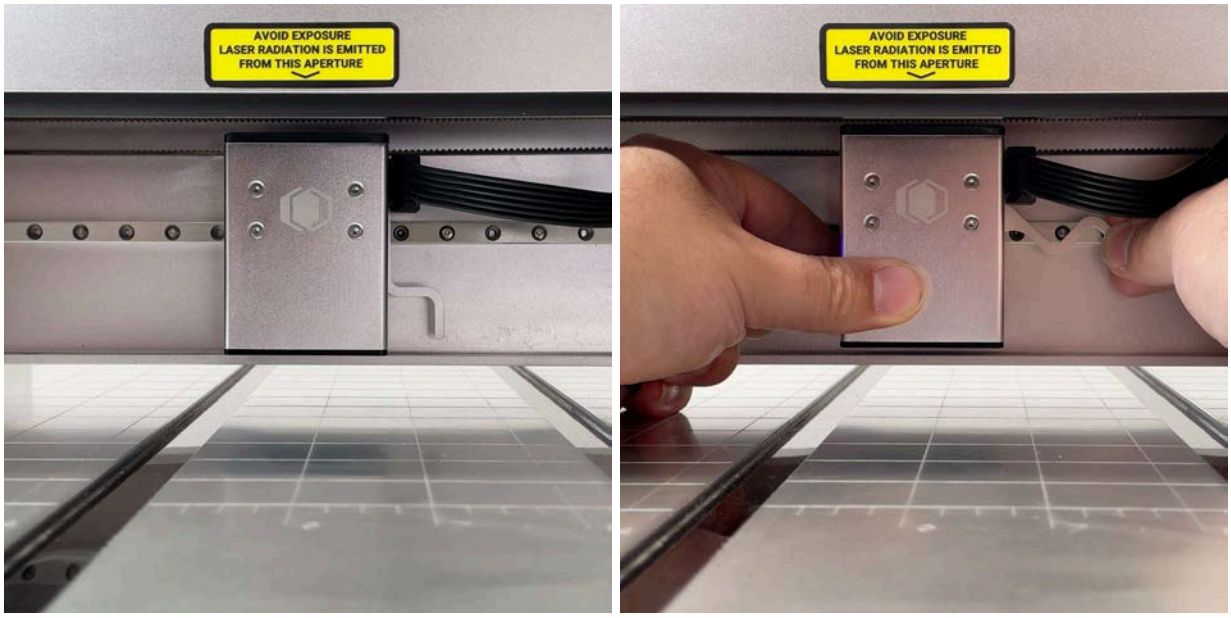
Finally, with a lint-less cloth or paper towel, wipe the area to clean off any remaining debris or water to be ready for subsequent use.

 © 2024 Rendyr, Inc.

Note: Never use any product with acetone on the Optic's cutting mat.

7.3. Cleaning the Laser Module

After a time, it will be essential to clean the Laser Module, most notably the lens.

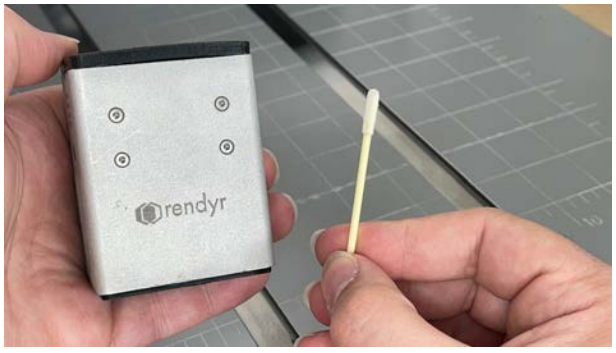


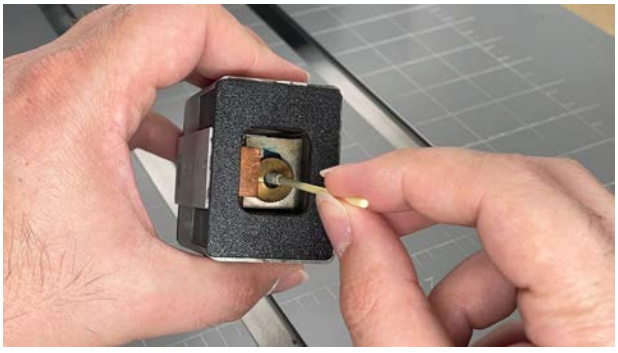
1. Turn off the power by unplugging the USB-C cables in the correct sequence. [See page.34 for further details] Take the laser module off the backplate by raising the cam lever, releasing the module's dovetail from the backplate.

 © 2024 Rendyr, Inc.

2. Detach the Laser Module Cable

3. Take one of the cue tips and spray it, so it is damp (not drenched) with the Laser Optic Cleaning Solution.

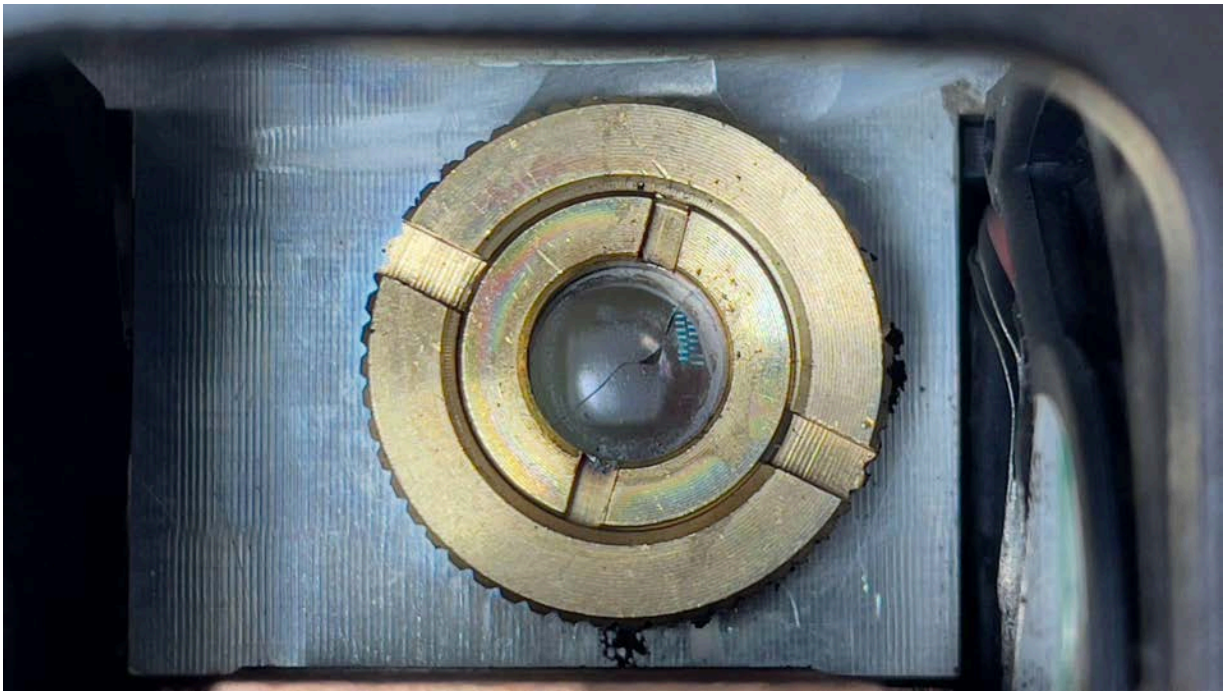


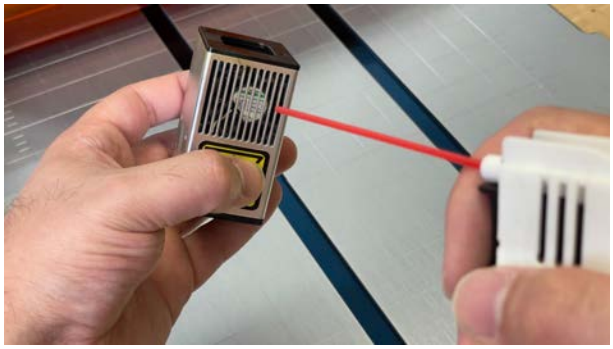


4. On the bottom of the Laser module, you will see the lens. Take the cue tip and clean the lens of any debris or soot.

 © 2024 Rendyr, Inc.

Warning: After the Optic has been in use the inner and outer components of the Laser Module will have increased significantly in temperature. It is very important to wait before cleaning, especially the Lens. Applying a wet swab of cleaning solution onto the surface of the lens while still hot could result in the lens cracking (as shown below). The Laser Module must cool down for at least 30 minutes and to room temperature before cleaning to avoid damaging the lens.





5. Take an air can and gently spray any other debris inside the laser module.

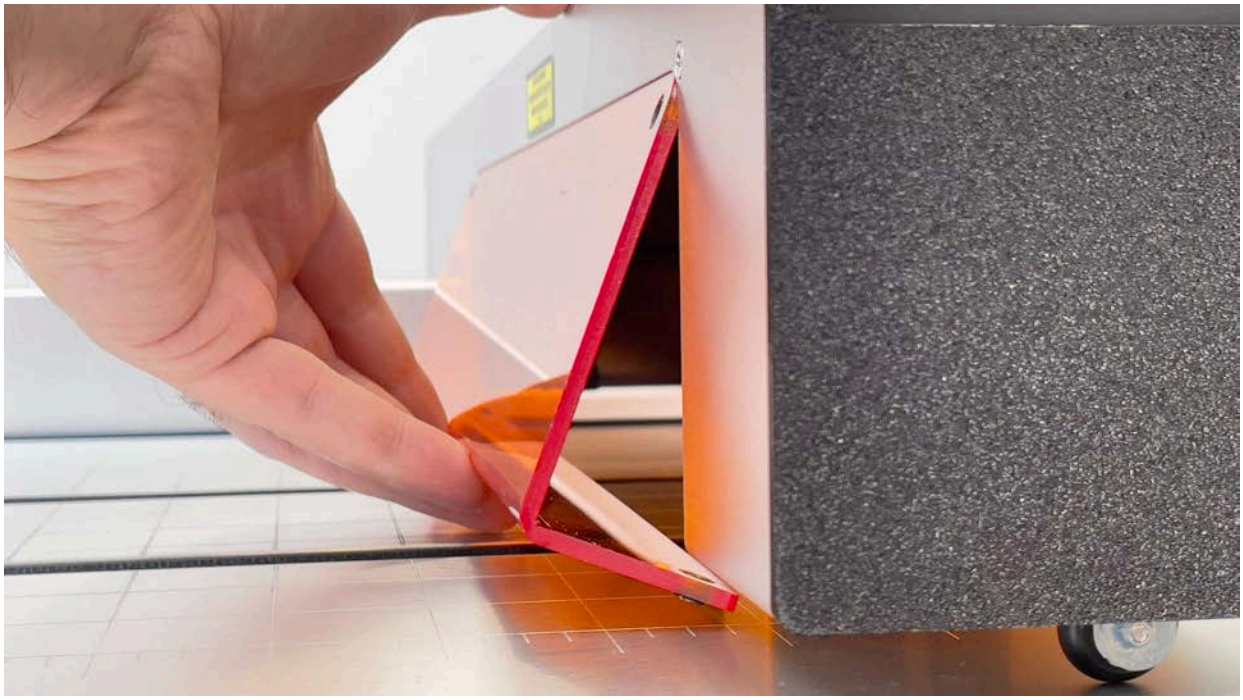
© 2024 Rendyr, Inc.

Once complete, you can place the Laser Module back onto the backplate to be ready for your subsequent use.

Note: Depending on the material you are using and power and speed settings used you may have clean the Laser Module more frequently. We recommend after 20 mins of use or after a long cut/engrave it is recommended to clean the module's lens so the laser will be unobstructed and produce its fullest power capable.

7.4. Cleaning Laser Safety Shield

© 2024 Rendyr, Inc.



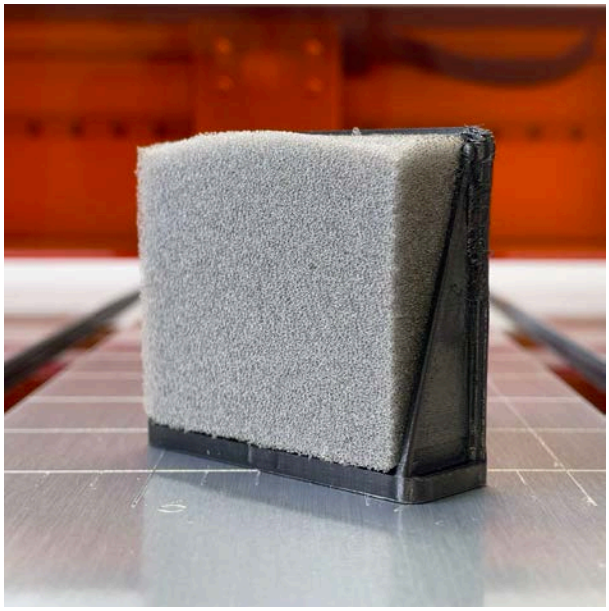
1. To clean the Safety Shield , start by removing the shield from the Optic.

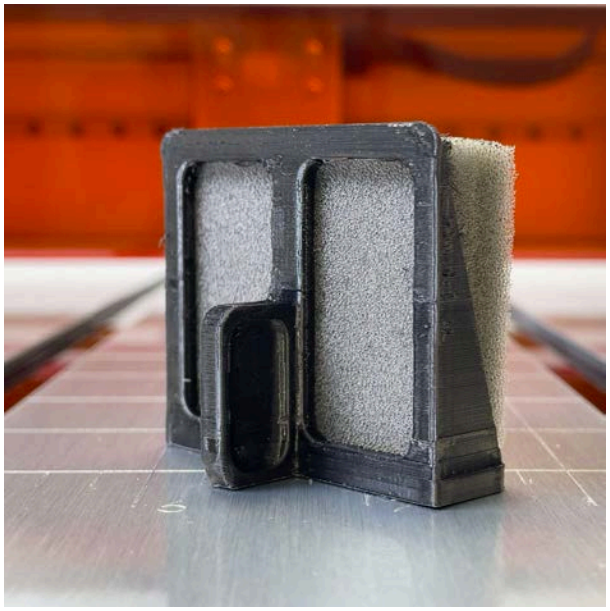
2. Rinse the shield under running water

© 2024 Rendyr, Inc.

3. Using a cloth or soft paper towl dry the shield before placing it back into the Upper body.

7.5. Cleaning the Pre-Filter

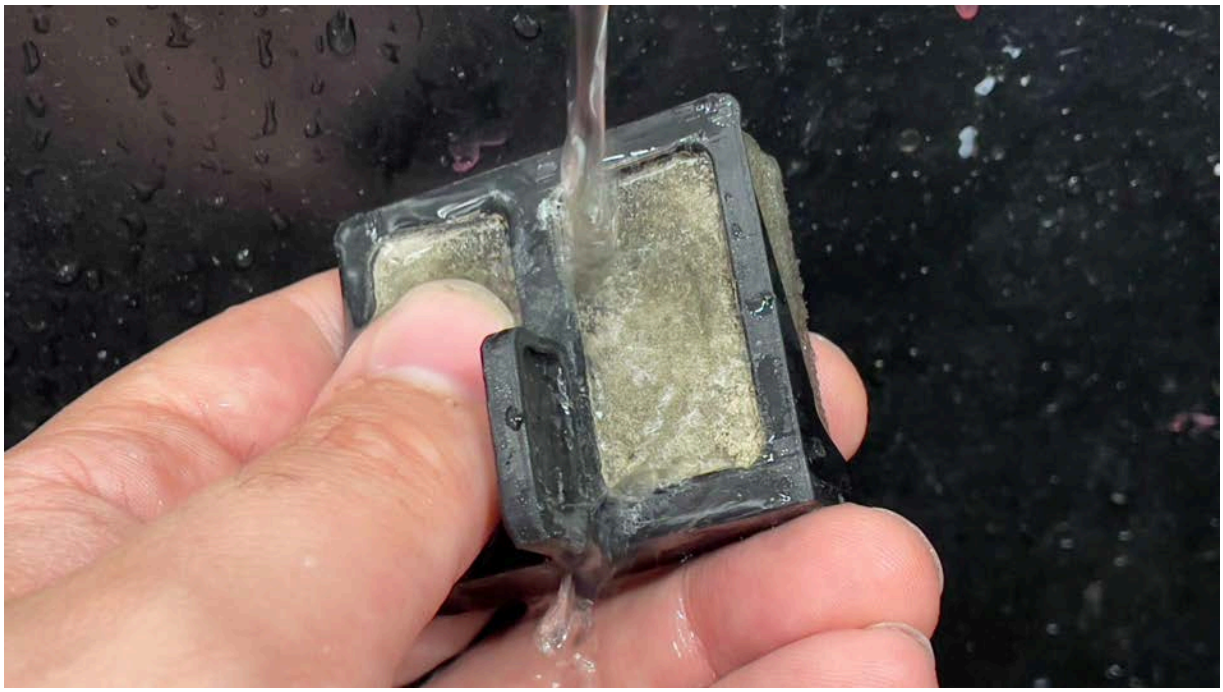




When laser cutting the Optic, smoke and debris will be pulled towards the filter. The Pre-Filter sits between the cutting area and filter and will catch a majority of debris before its filtrated by the Optc's filter. This preserves the longevity of the filter and keep all other components clean.

© 2024 Rendyr, Inc.

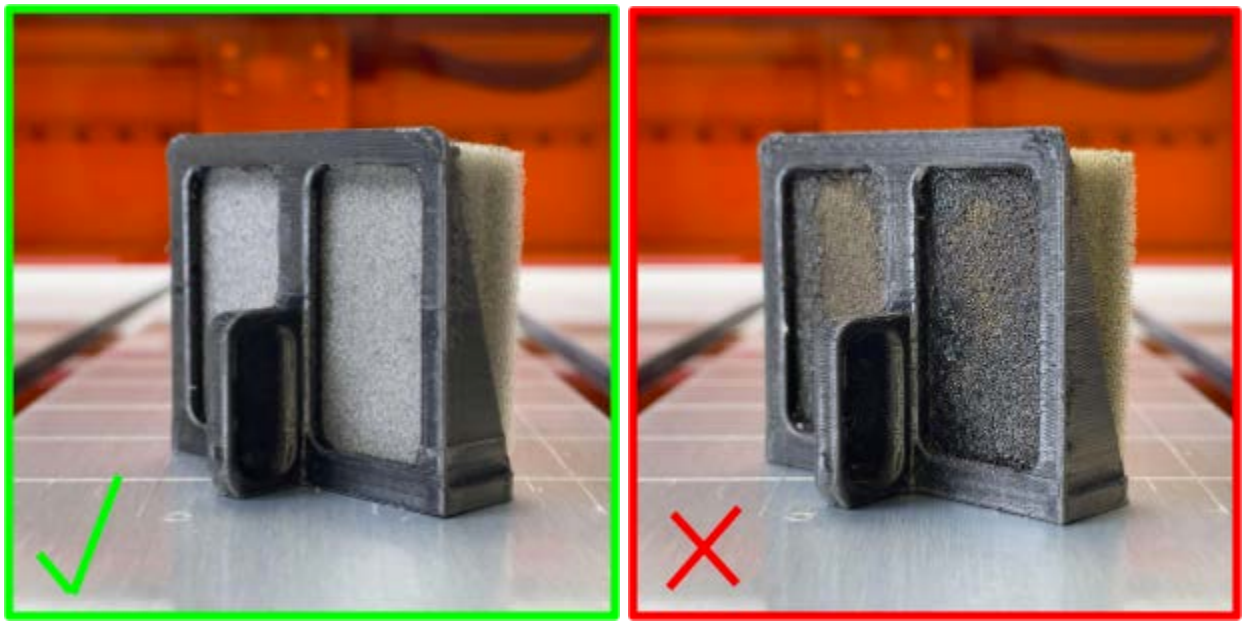
1. Remove the Pre-Filter from the Optic's Upper body. You will feel slight resistance from the magnet that holds it in place.



2. Wash the Pre-Filter under running water and scrub all the debris from the foam material.

 © 2024 Rendyr, Inc.

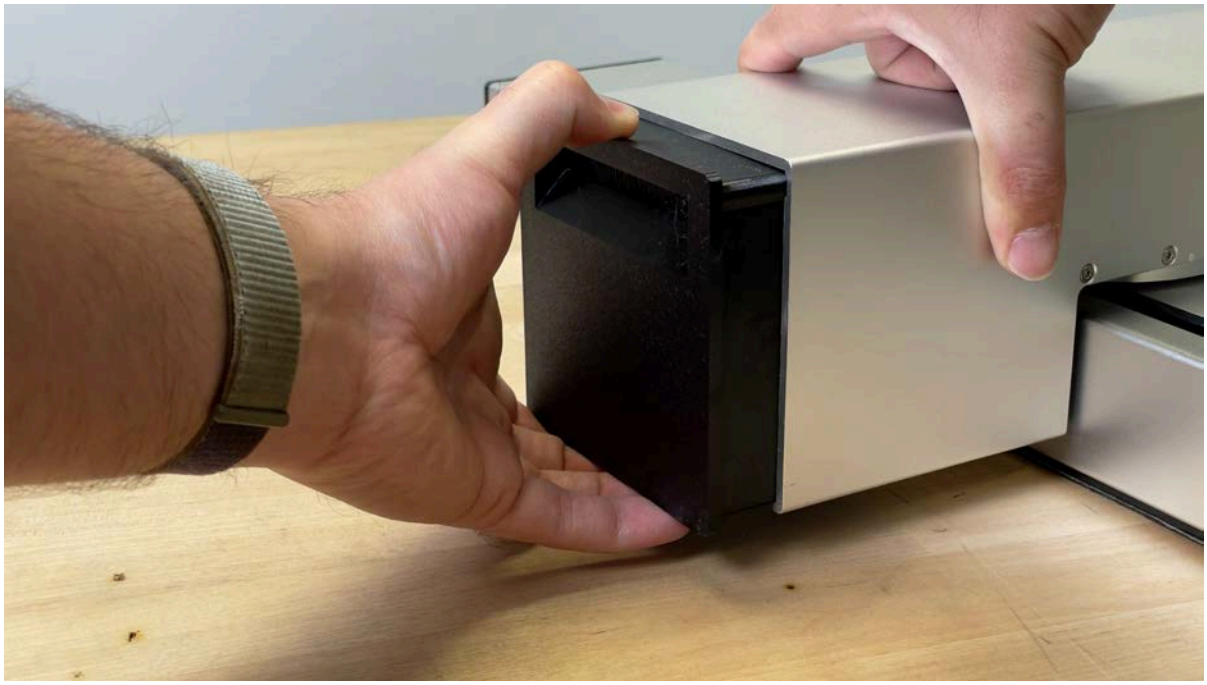
3. Using a paper towel, wipe any excess soot/debris from the foam before setting it down on a table to let it air dry completely.



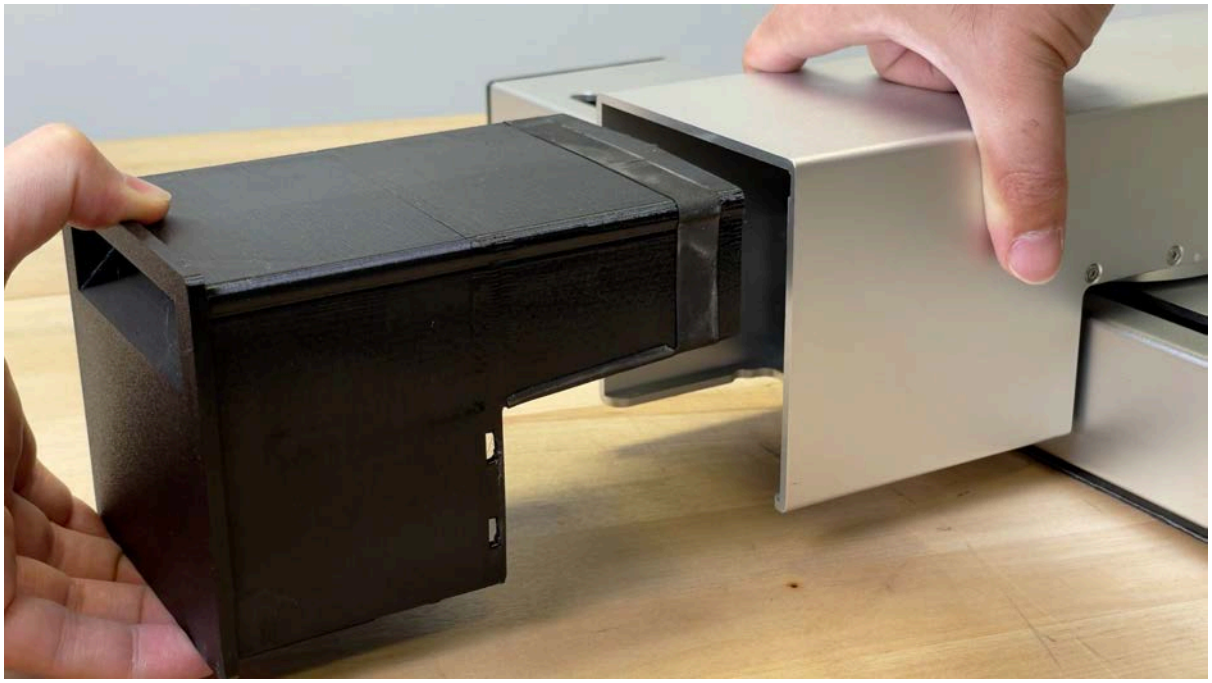
Your pre-filter should be clean as the top-left image above shows to have maximum filtration results.

© 2024 Rendyr, Inc.

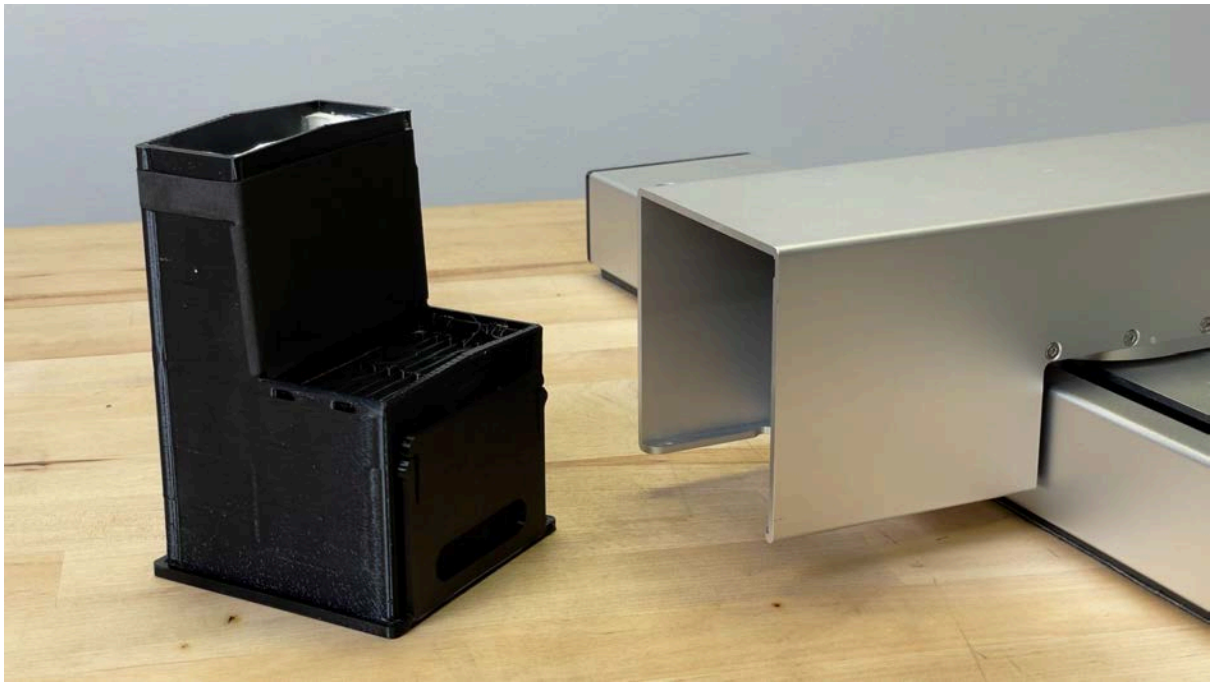
7.6. Replace Optic Filter

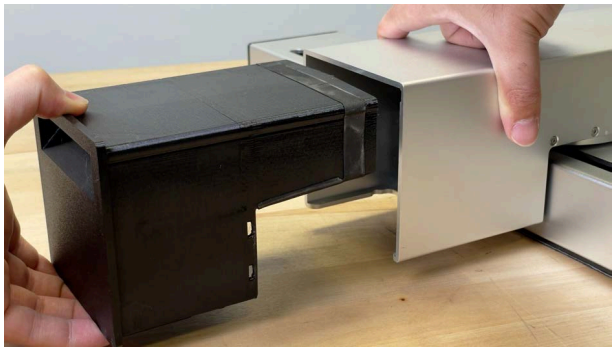


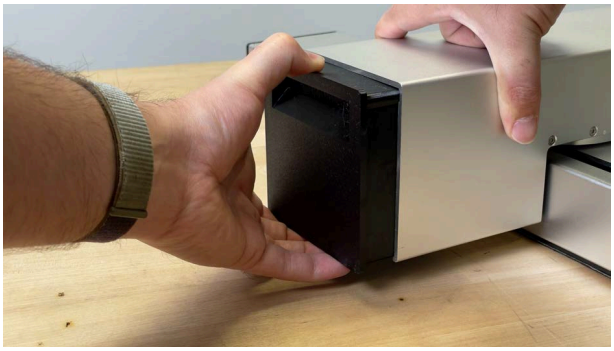
To replace the Filter grab the top and bottom with one hand and use your other hand to support the Optic. You will feel a lot of resistance when inserting and removing it from the Optic due to how tightly fitted it sits in the Optic.



 © 2024 Rendyr, Inc.



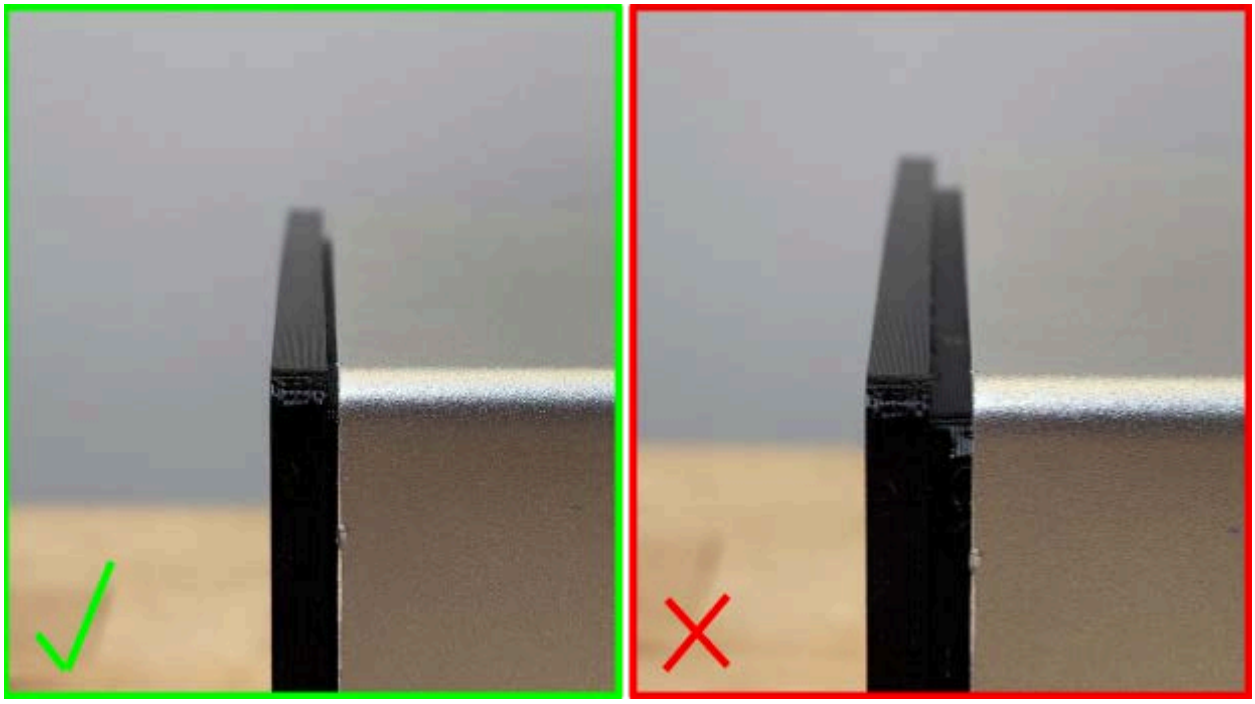




To replace the Filter reverse the steps above and insert the new Filter back into the Upper Body as shown above.

© 2024 Rendyr, Inc.

Align the Filter so it smoothly follows the groove into place.



Make sure your Filter is seated all the way into the Upper body for maximum fume capture.

© 2024 Rendyr, Inc.

Note: If the Filter is not seated correctly this can cause smoke and fumes to escape capture and flow outside of the Optic while in use.

© 2024 Rendyr, Inc.