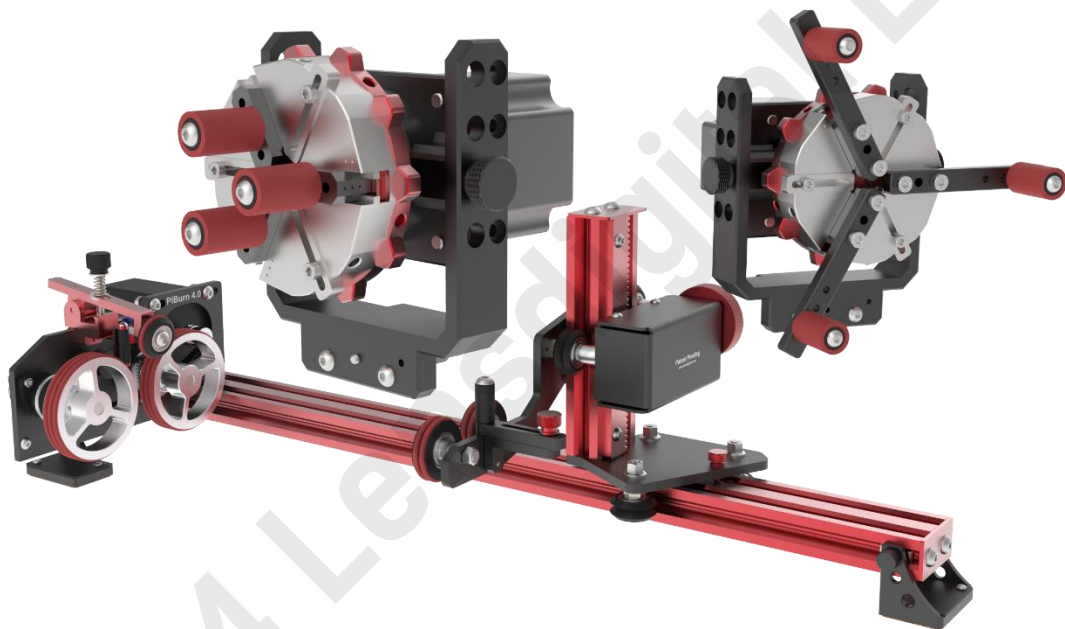


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# PIBURN GRIP

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## User Manual



Updated: December 21, 2023 ( get the latest version at: <http://piburn.info/manual> )

Note: PiBurn Grip is a chuck-style rotary attachment for laser cutters engravers that allows you to engrave cylindrical objects.

It's meant to replace your Y-Axis temporarily and will work with most Ruida-type controllers.

*Note: Due to constant improvements to the design, your PiBurn Grip might look slightly different from the one pictured in this guide.*

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## PiBurn Grip vs. PiBurn Roller

PiBurn “Roller” is a roller-style rotary attachment that relies on the friction of the drive wheels to keep objects rotating.

PiBurn “Grip” is a chuck-style rotary that holds engraving objects using a set of “jaws.”

The grip can be used as a standalone rotary or attached to the top of the existing PiBurn “Roller” for additional versatility.

The grip can be considered a different attachment to the rotary system. Grip and Classic share the same rail chassis, rear lift/support mechanism with wheels, back stopper system, and feet (either magnetic adjustable or standard fixed).

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## Main Diagram

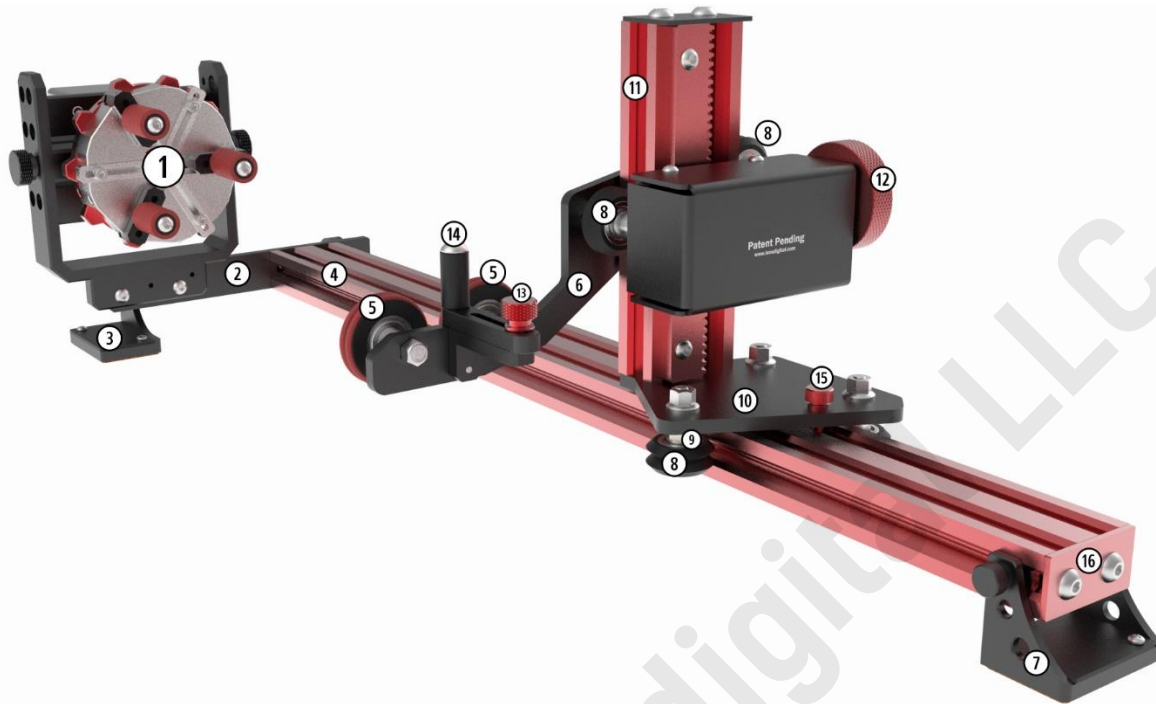


Figure 1. Front View Diagram

- 1. Grip Assembly
- 2. Grip the Headboard
- 3. Right Front Magnetic Foot
- 4. Main V-Slot Rail
- 5. Back Rollers
- 6. Footboard
- 7. Back Magnetic Foot
- 8. V-Wheels
- 9. Eccentric Spacer
- 10. Carriage

- 11. Vertical V-slot rail
- 12. Vertical Adjustment Hand Wheel
- 13. Back End-Stop Lock thumb screw (NOT Included, only available in OMNI Configuration)
- 14. Back End-stop Roller (NOT Included, only available in OMNI Configuration)
- 15. Carriage Lock Thumbscrew
- 16. V-slot rail Cover

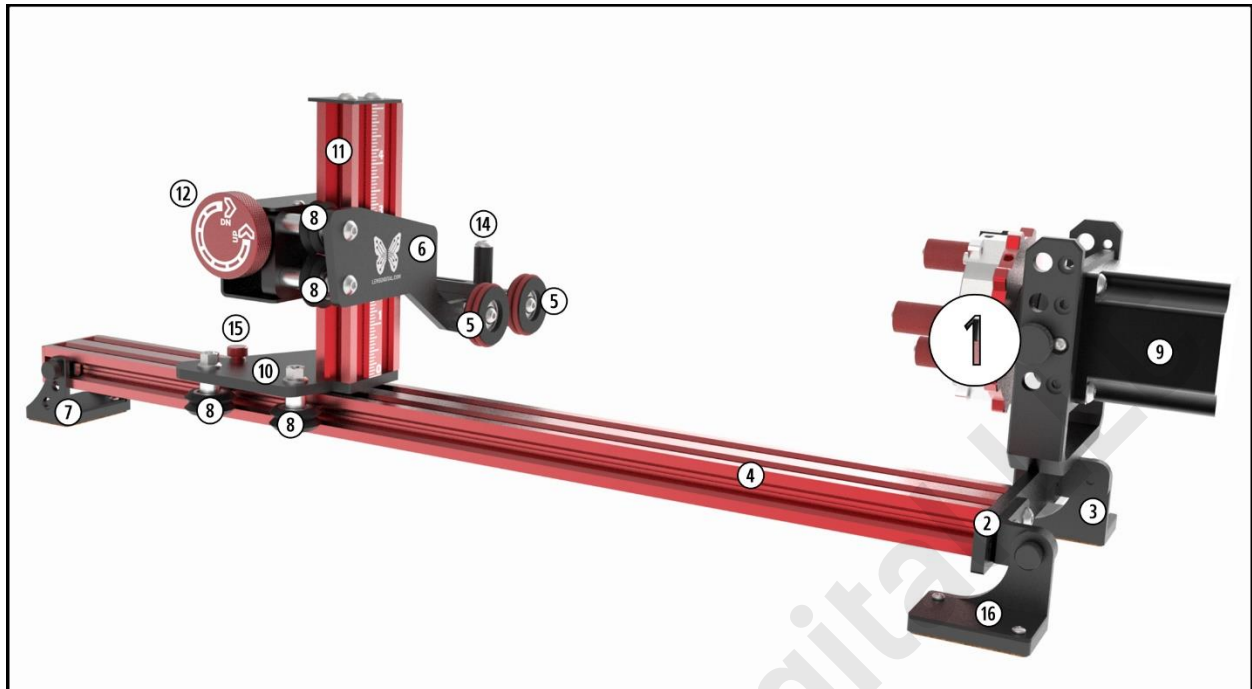


Figure 2. Side View

- |                              |   |
|------------------------------|---|
| 1. Grip Assembly             | 11. Vertical V-slot rail  |
| 2. Grip Headboard            | 12. Vertical Adjustment Hand Wheel  |
| 3. Right Front Magnetic Foot |   |
| 4. Main V-Slot Rail          | 14. Back End-stop Roller (NOT Included, only available in OMNI Configuration) |
| 5. Back Rollers              | 15. Carriage Lock Thumbscrew  |
| 6. Footboard                 | 16. Left Front magnetic Foot  |
| 7. Back Magnetic Foot        |   |
| 8. V-Wheels                  |   |
| 9. Motor                     |   |
| 10. Carriage                 |   |

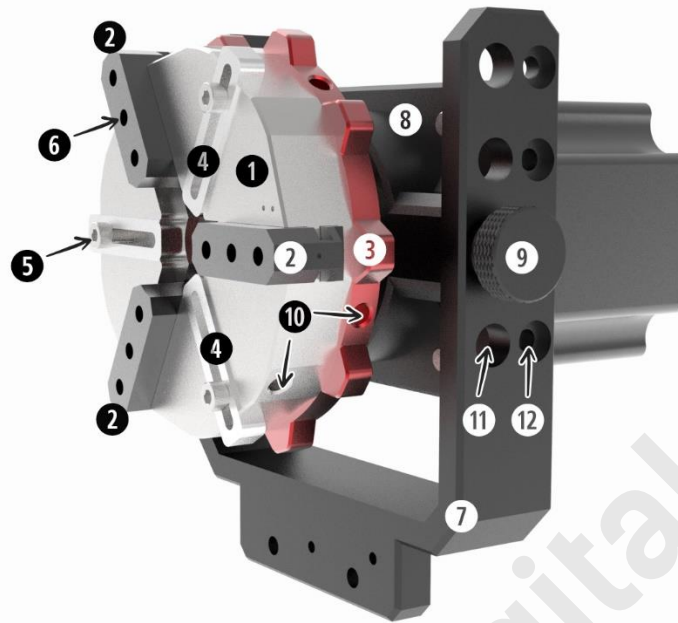


Figure 3. Main Grip Diagram

1. Grip Housing
2. Master Jaws
3. Scroll Wheel
4. Stopper Arms
5. Stopper Arm Screw
6. Jaw Mounting holes (3)
7. Universal Bracket
8. Motor Mount
9. Adjustment Thumb Screws (2)
10. Lever Holes
11. Adjustment Thumb Screw holes
12. Fixator screw holes

## Grip Add-On Parts List

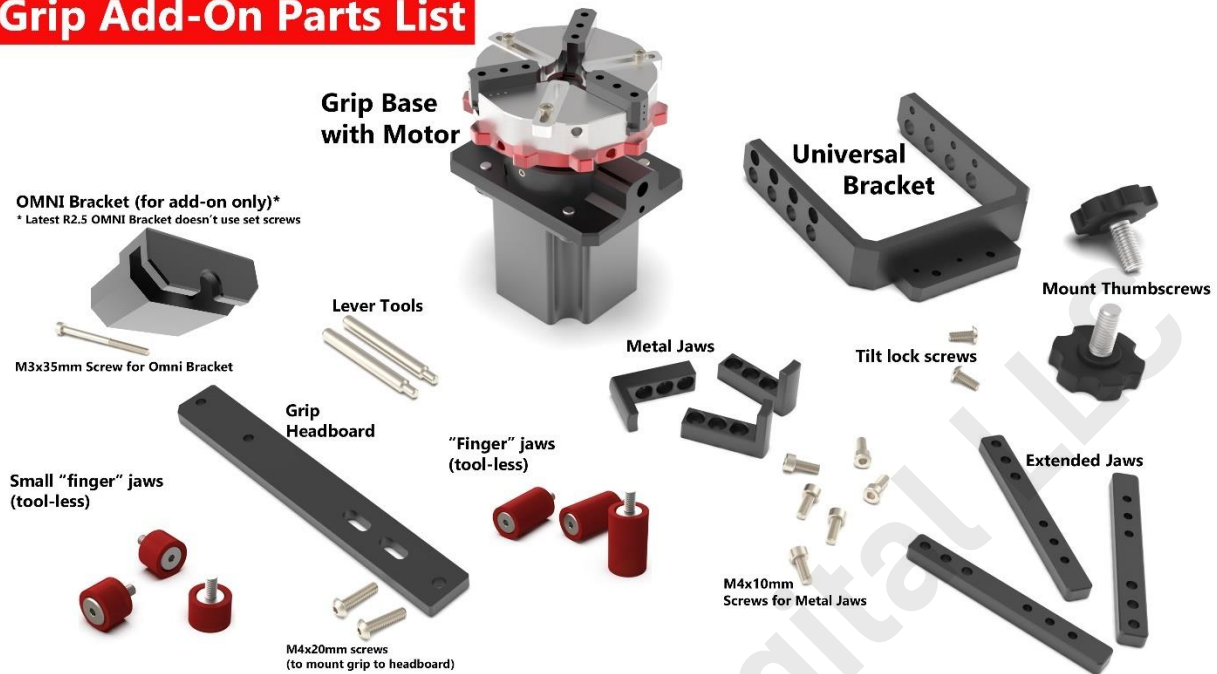


Figure 4. Parts List

Part	Description
Universal Bracket	Holds Grip Base and attaches either to PiBurn Headboard (add-on version) or directly to the rail via Grip Headboard.
Headboard	Attaches Grip to the rail. It also holds feet.
OMNI Bracket	To attach the Universal bracket to the existing PiBurn 3.0 or 4.0 headboard using an M3x35mm screw. New (R2.5) bracket doesn't use 2 extra set screws
Lever Tools	Used to tighten up objects in the Grip when extra holding torque required
Mount Thumbscrews	Main screws used to attach Grip Base to Universal bracket. It can be used to control the Tilt Angle of the Grip
Tilt Lock Screws	(2) M4x10mm screws used to lock Grip in a horizontal position (prevents Tilt)
"Finger" jaws	Primary jaws with rubber jackets are used to hold various objects. Now "tool-less", screw them into base jaws with your hands, no tools needed!
Small "finger" jaws	Smaller jaws. Work with tumblers with "inner rim."
Metal Jaws	Used to hold objects from outside. Now "tool-less", screw them into base jaws with your hands, no tools needed!
Extended Jaws	Sold separately. Work with "finger" jaws, used to hold large-diameter objects like dog bowls.

## Chapter 1: Initial Assembly

If you purchased PiBurn in Full or Stand-alone, everything is already assembled, and you are good to good. Just read the section about using the grip and swapping jaws.

If you purchased PiBurn Grip-Add, please follow these instructions on how to attach the grip to your existing PiBurn.



Figure 5. Choosing Configuration (for Add-On)



## Attaching PiBurn Grip on top of PiBurn headboard (OMNI Configuration)

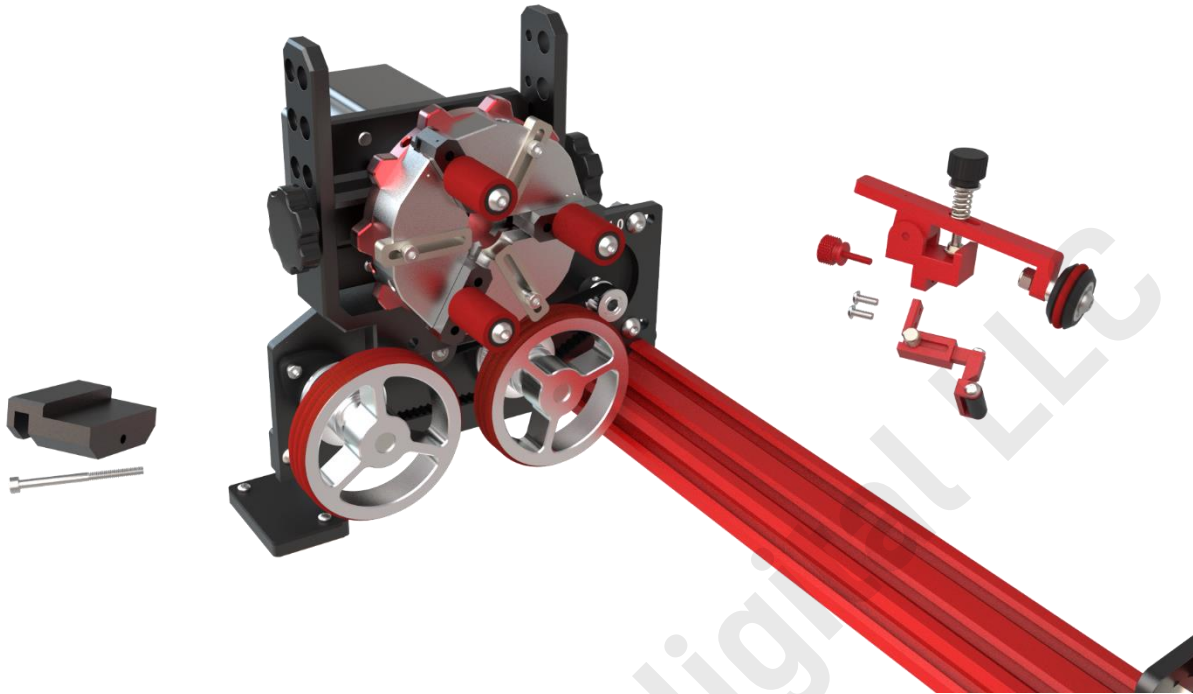


Figure 6. Omni Configuration

This is the fastest way to go from Roller to Grip and back!

Please note that this method might not work for older revisions of the PiBurn V3. Those with plastic clamps might be missing a hole to attach the mount adapter.

Also latest OMNI bracket has a slightly different look (it has large center hole in the middle and doesn't use two set screws that were in the previous version. You might find M3x40mm screw in your kit, it will work same as M3x35mm Screw

1. Remove your existing Clamp by unscrewing the red thumb screw behind the clamp. Also, if your rotary came with a separate front-end stopper, you would have to remove that as well by unscrewing two little M3x8mm button head screws using a 2mm hex Allen key
2. Slide in OMNI Bracket on top of the headboard and align the hole in the adapter with a hole in the headboard.
3. Insert a long M3x35mm Screw from the back of the headboard into the adapter, just not all the way, until it's flush with the exit hole.
4. Now place Grip Universal bracket on top of the adapter, align the holes, and screw in a long M3x35mm screw. Tighten it fully. Note head of the screw will go past the bracket and rest on the headboard (in the latest version)

Follow the steps in reverse to remove the Grip and re-install the clamp. You will not need Clamp and Front End stopper when using Grip!

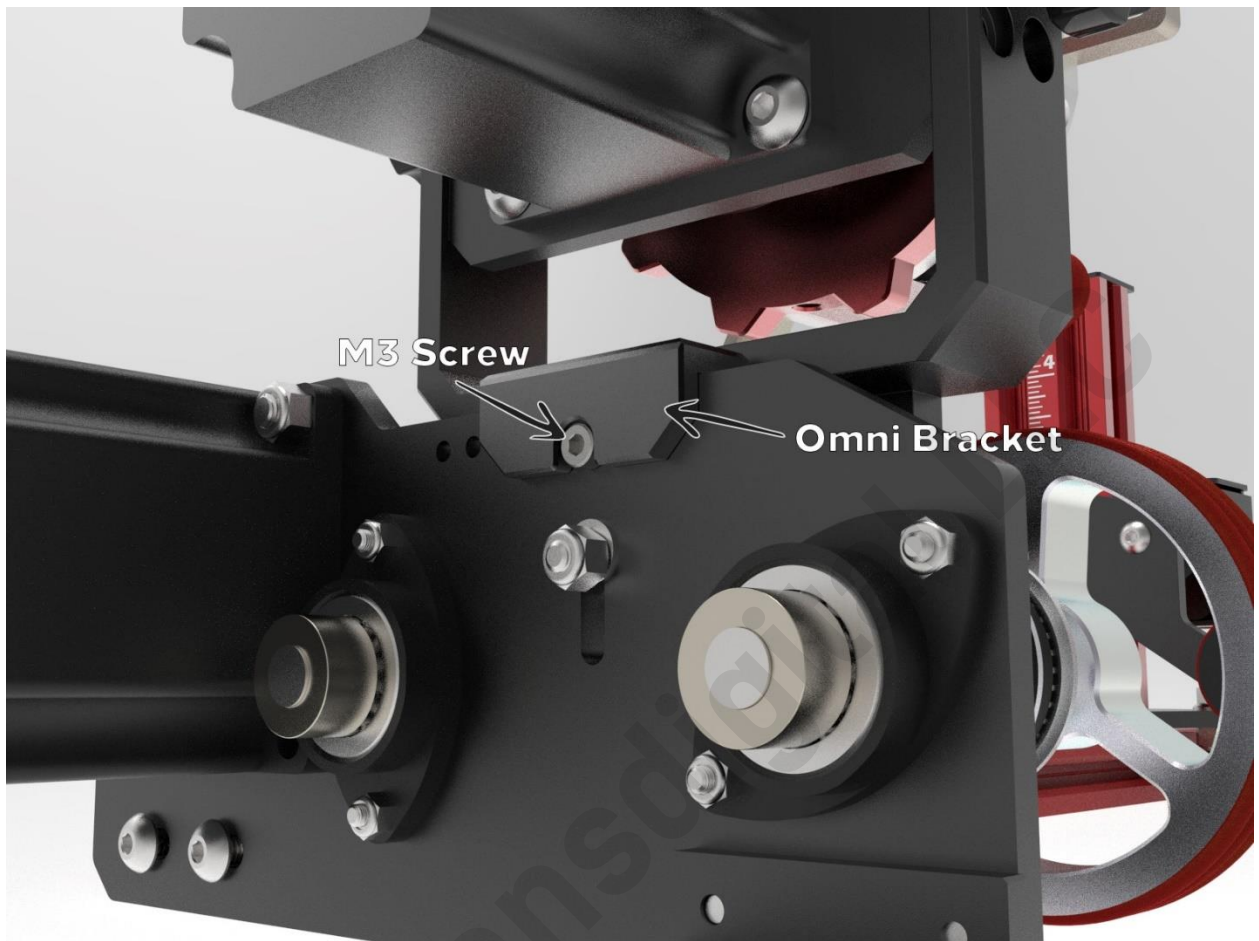


Figure 7. R2.5 Omni Bracket (installed)

## Attaching PiBurn Grip instead of roller head unit (Grip Stand-alone configuration)

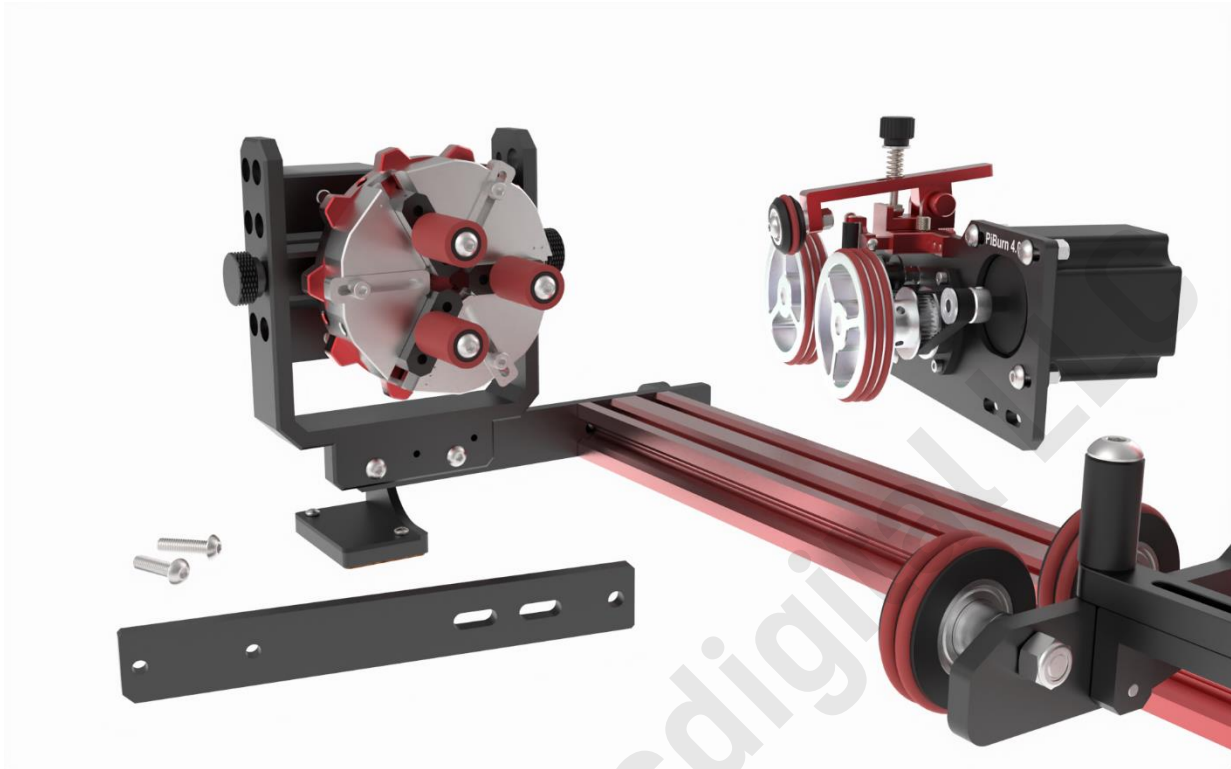


Figure 8. Stand-alone config

You can set up Grip in this configuration by removing the existing PiBurn roller head unit and feet and replacing it with Grip. This configuration will provide the lowest possible position, which is excellent for lasers that don't have much Z-axis travel!

**NOTE:** Procedure is slightly different if you have older V3 with Plastic Feet! We will describe both!

Let us know if you are missing longer M4x20mm (or M4x25mm) screws described below. If you can't source them locally, open a help desk ticket thru our website and we'll send you those.

## Magnetic Feet Version

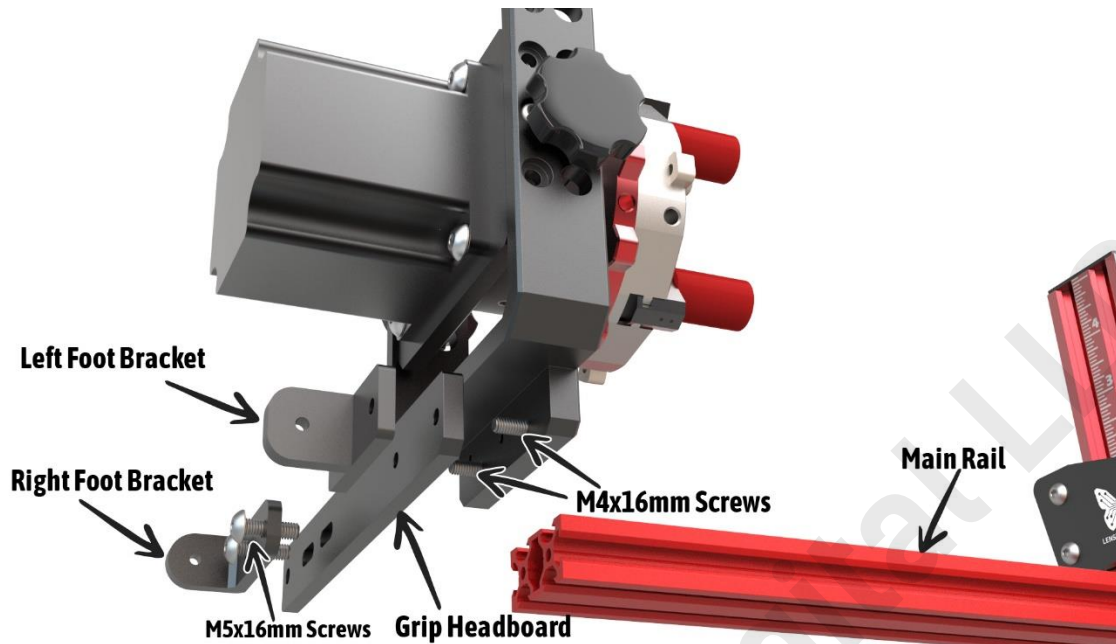


Figure 9. Magnetic Feet version

1. Loosen up thumb screws holding back foot, fold it up and tighten screws. (For Plastic feet loosen up M4 screws with 3mm hex key.
2. Remove the thumb screws holding the front feet and remove them. (For Plastic Feet remove M4 screws with 3mm hex key)
3. Unscrew the right foot base (one that's further from the main rail) and remove it, you will need this base later on, but you will use new longer screws to attach it to the grip bracket. If your foot is plastic it will also have two M4 Nylock nuts, save these as you will need them to reattach foot to the grip.
4. Unscrew the left foot base. This will remove your PiBurn roller head unit from the rail. Move it aside.
5. Attach the new Grip headboard to the rail. To do this:  
Put two M5x16mm screws (the same ones you removed in step 3) through the right foot bracket, the grip headboard, and the main rail. Tighten them just slightly; we'll be adjusting the headboard position later-on
6. This step will vary depending on type of feet you have (plastic vs metal)  
For **Metal Feet** take your grip and two M4x16mm screws that came with your add-on kit. Put screws thru unthreaded holes on the grip's universal bracket and insert them into the two holes on the headboard.  
For **Plastic Feet** use Longer M4x20mm (or M4x25mm) screws.
7. For **Metal Feet**, place the right foot base behind the headboard and thread these two M4x16mm screws into the foot base. Tighten fully.  
For **Plastic Feet**, place the right foot base behind the headboard, thru the M4x20mm (or M4x25mm) screws and secure with M4 nylock nuts take from step 3.

8. Align the center of the grip to the back wheels using alignment instructions in the next section.  
(or check video on how to do it: <https://youtu.be/Kz7z3ooR5s8>)
9. Finally, attach the front feet with thumb screws and unfold all feet.

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## Simple/Regular Feet Version

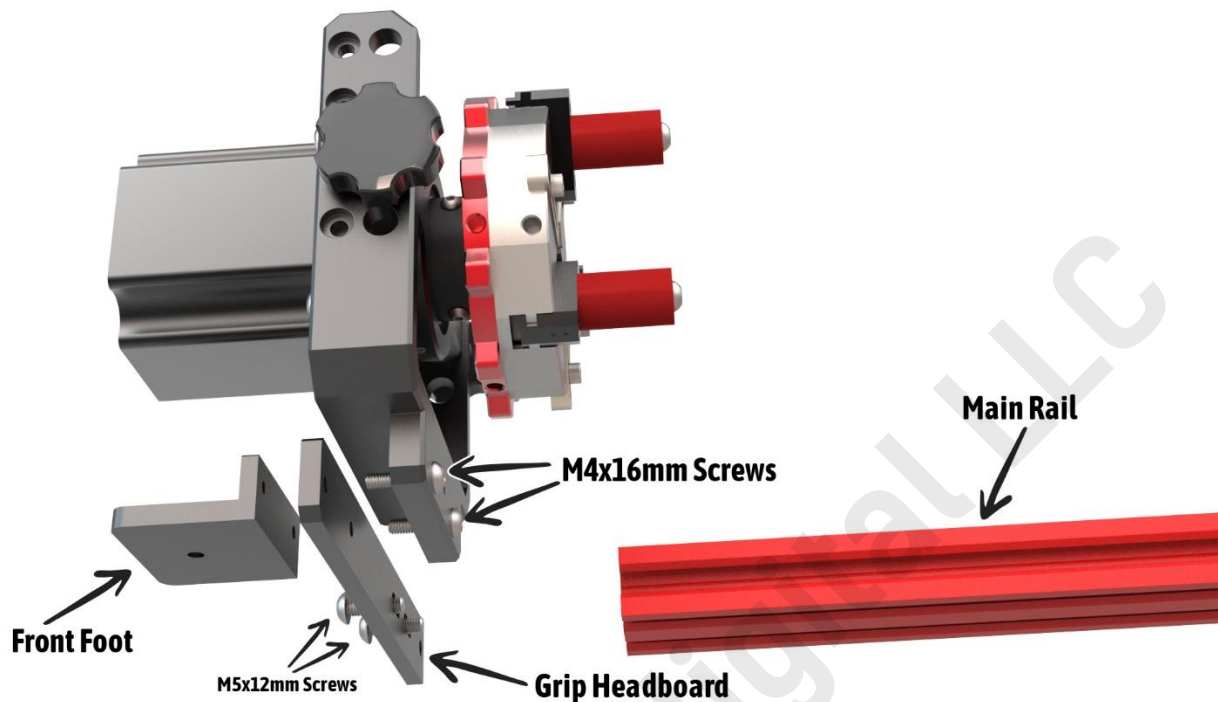


Figure 10. Simple Feet Version

1. Unscrew the front foot. For plastic version you will also have M4 nylock nuts, keep them for next steps!
2. Remove two M5x12mm screws holding the roller headboard to the rail. Save screws.
3. Attach the new Grip headboard to the rail using the same M5x12mm screws. Don't fully tighten yet.
4. Take your grip and two M4x16mm\* screws that came with your add-on kit. Put screws thru unthreaded holes on the grip's universal bracket and insert them into the two holes on the headboard.  
If you have plastic foot, use M4x20mm (or M4x25mm) screws instead!
5. For Metal Foot, place the front foot behind the headboard and thread these two M4x16mm screws into this foot. Tighten fully.  
For Plastic Foot, place the front foot behind the headboard and insert two M4x20mm (or M4x25mm) screws into this foot and screw in with M4 Nylock nuts from step 1. Tighten fully.
6. Align the center of the grip to the back wheels using alignment instructions in the next section.

## Aligning grip to the back wheels

You will want to align its center precisely between the back wheels when using Grip in a stand-alone configuration.

We have a short video that shows this process: <https://youtu.be/Kz7z3ooR5s8>

1. Remove any jaws attached to the base jaws. Do not remove base jaws!
2. Secure the plastic alignment tool between all three base jaws and hand-tighten them by turning the scroll wheel.

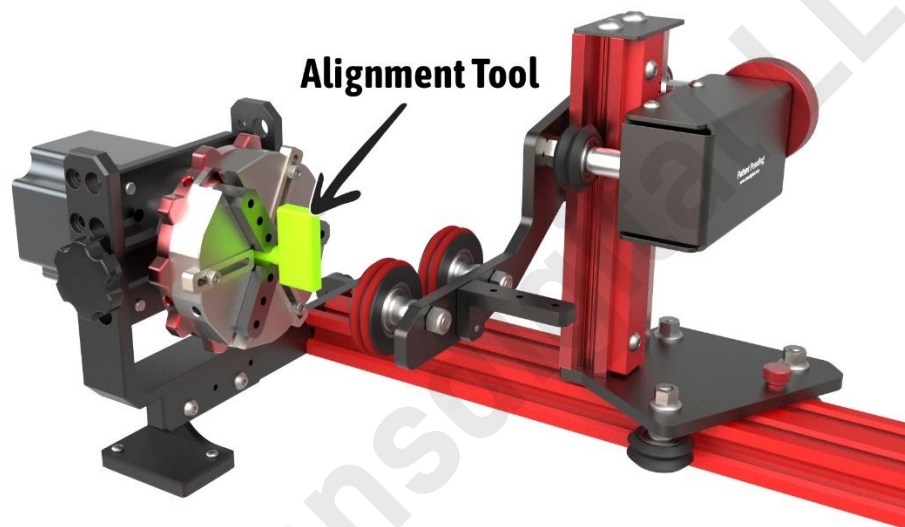


Figure 11. Alignment

3. Turn the grip's head so the alignment tool is in a vertical position.
4. Lower back wheels and move the carriage forward towards Grip.

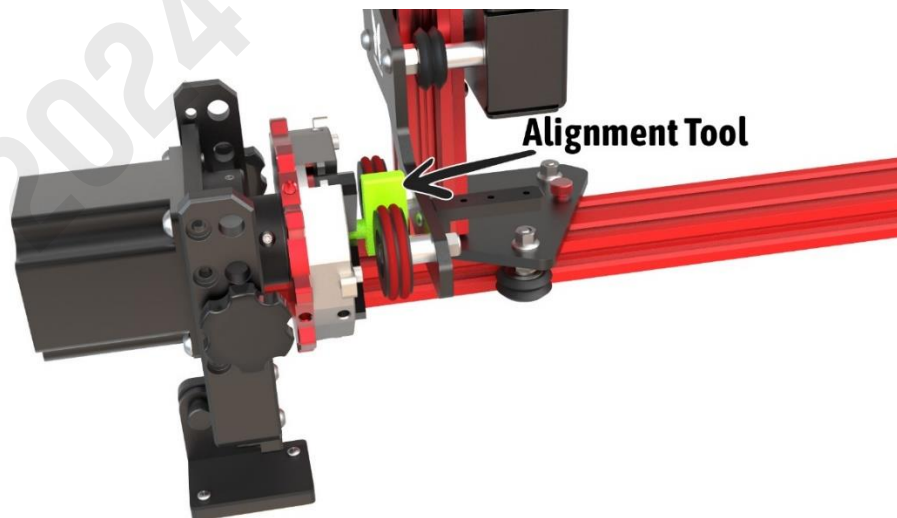


Figure 12. Alignment



5. Loosen up two screws holding the grip's headboard to the rail so you can move the whole thing left or right a little.
6. Start raising the footboard with wheels trying to get them to roll onto the alignment tool. Move the headboard left or right to get this right.

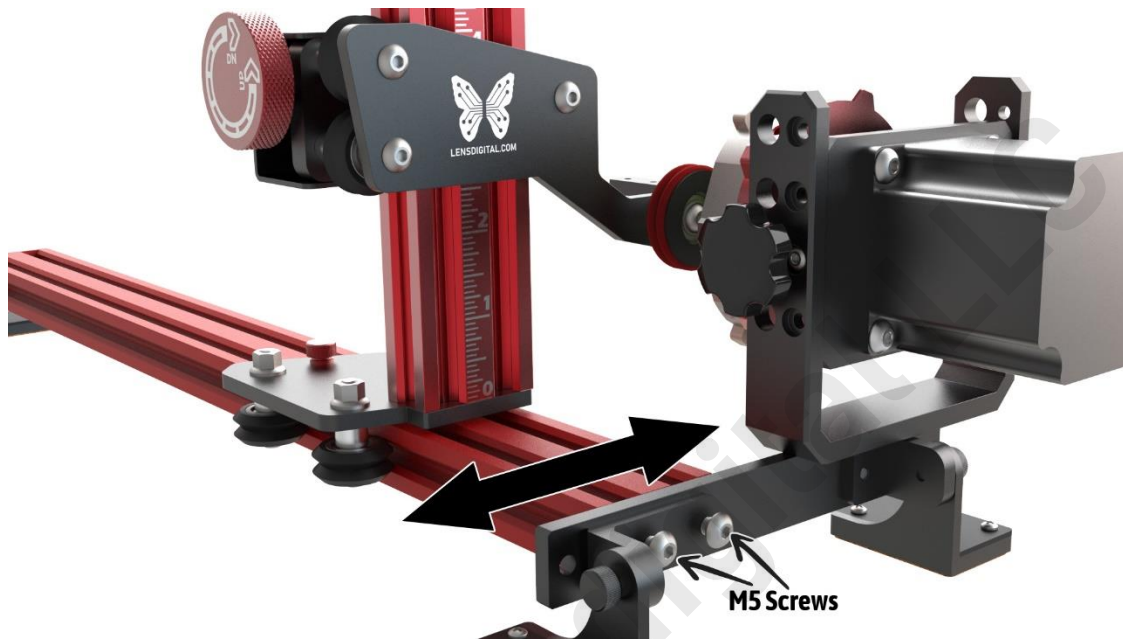


Figure 13. Alignment adjustment

7. Once both back rollers are hugging the alignment tool tight, start tightening two M5 screws holding the headboard to the rail.
8. Finally, lower the footboard until the wheel slides off the alignment tool and remove the tool from the grip's jaws.



## Chapter 2: Connecting to Laser (Hardware Setup)

NOTE: Different laser machines have different ways of connecting rotary attachments. Some (i.e., Boss Lasers made after 2020, Aeon Mira/Nova, Thunder laser) have dedicated rotary port and either a manual switch or automatic relay to enable it. In machines that don't have a dedicated rotary port (i.e., Boss Laser made before 2020, OMTech, and other generic), you will usually unplug your Y-axis motor and plug in the rotary instead.

**Whenever possible, Follow your Laser Manufacturer's instructions on connecting the rotary!**  
**This procedure will mostly be the same for ALL rotaries, including PiBurn Grip, except for actual steps per rotation settings, which will be different.**

*For Machines **without** a dedicated Rotary Port:*

1. Locate the Y-Axis plug. This is where your Y-motor is plugged in. Usually, it's located in the "work chamber" and easily accessible once you lift the main machine cover. On Boss Laser machines plug is located toward the back

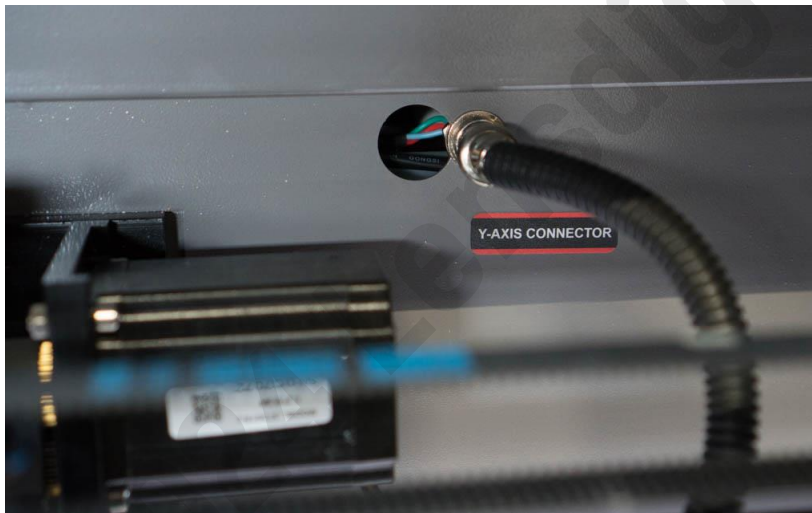


Figure 14. Y-Axis Connector

2. Lower your bed so PiBurn can easily fit under the laser nozzle
3. We also recommend that you move your laser head to the top right corner (or whenever your normal homing position is) via control panel arrows and save position (i.e. "Origin" button on the control panel) before turning the machine off. It's safer this way because the laser head tends to move very fast to the position it was in last before the machine was powered down. It can injure or surprise you when it does that.
4. Finally, power down the machine.

*For Machines with Dedicated Rotary Port:*

1. Power on your laser and let it auto home.

2. Place the rotary in the desired position, lower the table if needed and align the gantry over the rotary.
3. Locate the Rotary port (note on some machines (i.e., Aeon Mira). You might have to lower the z table to gain access to this port and plug in the Rotary
4. If your laser machine has a Rotary switch, switch it to the rotary position.

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## Install PiBurn Grip inside the machine

(See note for Thunder Laser)

When physically placing the PiBurn inside laser, you have three options:

1. Place it on top of the Honeycomb Table
2. Place it on the “knife blades.”
3. Place it directly on the laser floor

If you have enough headroom space, you can place PiBurn directly on the honeycomb table. For PiBurn with Magnetic Feet, it's best to use a honeycomb made out of ferrous metal (i.e., NOT aluminum). However, if you have an aluminum table, magnetic feet will still provide added benefit due to their cork pads.

You can also place PiBurn directly on its feet on top of your knife blades or honeycomb table. If you have magnetic feet and fold them for extra space, or if your blades are too wide to accommodate magnetic feet size, you will need to place it on some flat piece of material like plywood or acrylic. PiBurn with simple feet can also be screwed into the wooden surface for extra stability. You can even cut an exact-size plywood piece that can be placed against the edge of your laser machine, thus giving accurate alignment to the laser gantry. When engraving larger objects, and if your laser machine allows, you can remove knife blades and place the rotary directly on the laser bed. If your laser bed has sloping walls, you can adjust the angle of magnetic feet and attach them to those walls. Please clean your walls first, so your feet have more grip.

Plug in your rotary as described above.

Carefully arrange wire, PiBurn, and supporting platform, so it doesn't interfere with the laser bed going up or down. We don't want the wire to get pinched between moving parts.

Turn on your machine (if it wasn't on already).

## Homing Machine with Rotary Attachment

When you turn on your laser, it needs to perform a “homing” sequence so it knows its start position. This usually involves moving the gantry and laser head into the top right (or left on some machines) corner until it reaches the end-stop limit switch. Then laser will move a little away from the limit switch and back. Upon completion of the homing sequence laser head and gantry will want to move rapidly to the last know position where it was when you turned off the laser.

In many laser machines, when you plug in the rotary, you disable the Y gantry motor, so it won't be able to reach the limit switch. In cases like that, you must move the gantry by hand to simulate a typical homing sequence. But sometimes you can't move the gantry because its motor is still under power. In that case, you should only plug in the rotary after the machine finishes homing sequence.

To home gantry by hand, push the whole gantry back to trigger the Y-axis limit switch.

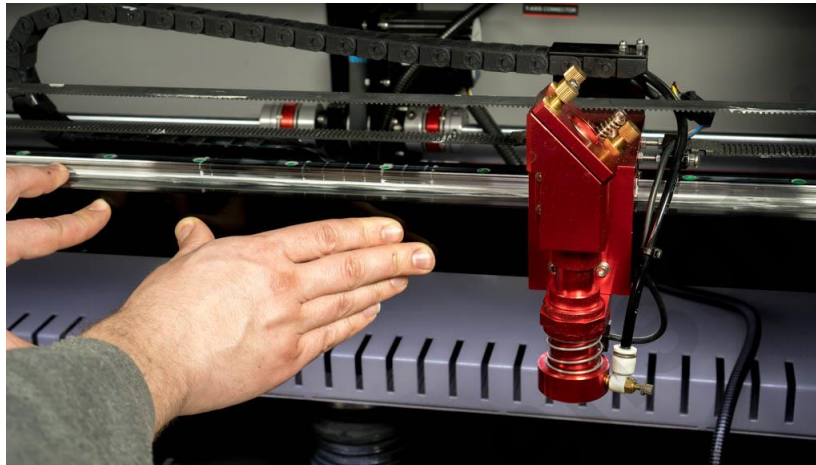


Figure 15. Pushing Gantry

- You'll notice that the Grip body on the Piburn will start rotating in the opposite direction after you reach the limit switch. That's because the laser wants to move the gantry back a little.
- Pull the gantry towards yourself just a bit, so it disengages the limit switch and finally pushes it all the way back again.

At this point, you manually finished performing the initialization process that the machine usually does automatically when Y-axis is plugged-in, and it should all be set to continue with the software setup part.

### **Note for Thunder Laser Owners (might apply to other lasers as well):**

**You will not be able to move your gantry by hand because the Y motor is always powered on. Thus, it would be best to position the gantry using the arrow keys above the rotary before turning it on or plugging it in.**

## Chapter 3: Connecting to Laser (Software Setup)

You will need to input two settings to configure your PiBurn Grip with a laser machine correctly.

The first setting is **Object diameter**. This is the **actual diameter** of the object you will be engraving. You'll have to measure your tumbler, cup, or bottle and write down this number.

Note that this differs from the diameter setting for a Roller type rotary!

The second setting is "**Steps Per Rotation** (a.k.a. **Circle Pulse**"). This number tells your laser machine how many pulses/steps it needs to send to the rotary's motor to perform a full 360-degree rotation. Or in practical terms, it controls how far your engraving object is rotated. If you set this number incorrectly, your engravings will squish or elongate. This number depends on how your laser engraver was set up at the factory.

Known "Steps Per Rotation" Values:

Laser Machine/Model	Steps per Rotation
<b>Boss Laser LS1420/1416</b>	2,400* or 3,200
<b>Boss Laser LS1630 and above</b>	5,000
<b>AEON Laser (before June 2023)</b>	10,000
<b>AEON Laser (after June 2023)</b>	12,800
<b>Thunder</b>	8,000**
<b>OMTech</b>	2,000* or 5,000
<b>AP Laser</b>	5,000

\*Most common steps setting

\*\* First few Thunder Grips shipped in December 2022 had steps set on the motor to 4000. We recommend changing it to 8000. You can do this by flipping switch 1 and 2 to UP position and 3 and 4 to down.

For all others, it must be determined by looking at Stepper Driver DIP switches, as described below. **DO NOT CHANGE THE DIP SWITCH POSITION!** Only note them.

## Find Out Steps per rotation for Unlisted/Unknown machine

### **WARNING!**

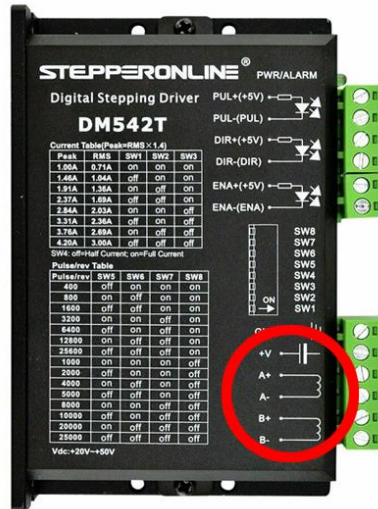
Your machine must be completely powered off, unplugged, and discharged because you must go inside the electronics compartment to inspect some switch settings visually.

1. Open the door that leads you to the internal electronics compartment. On the Boss 1630 series, it's located in the back of the machine.



Figure 16. Door to electronics

2. Locate Stepper Motor Driver that controls your Y motor. Stepper Driver looks similar one in the picture below.



2-phase driver





Here's what it looks like inside the Boss Laser LS-1630 machine (notice drivers are labeled):

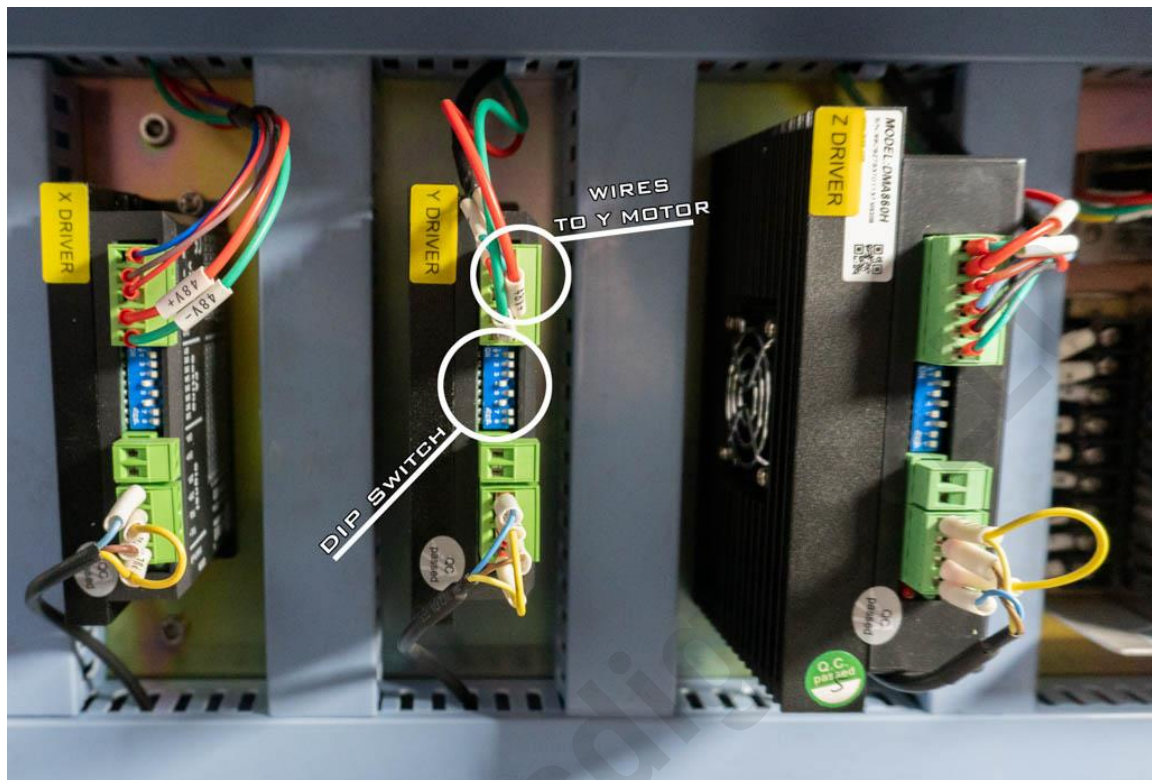


Figure 18. Stepper Drivers inside Boss Laser

4. If yours are not labeled, try tracing wires from the plug where your motor was plugged in (and where we now connected the PiBurn rotary).
5. Write down (or take a photo) of:
  - a. **Make and Model Number** of your **Stepper Driver**
  - b. Position of **"DIP" switches**. These are tiny switches on the back of the motor driver that can be flipped up or down. There are about 6-8 of them. Please refer to Figure 8. Stepper Drivers inside Boss Laser
6. Find out how many **"Pulse/Rev"** (Pulses per Revolution) is your Y driver set to.  
The position of **DIP switches** determines the **"Pulse/Rev"** setting.  
Many stepper drivers will have a **"Pulse/Rev"** table printed on them (see Figure 9. Close look at stepper driver). If yours doesn't, search online and download your stepper driver model manual. In the manual, find the **"Pulse/Rev"** table.



Let's look at the example below:

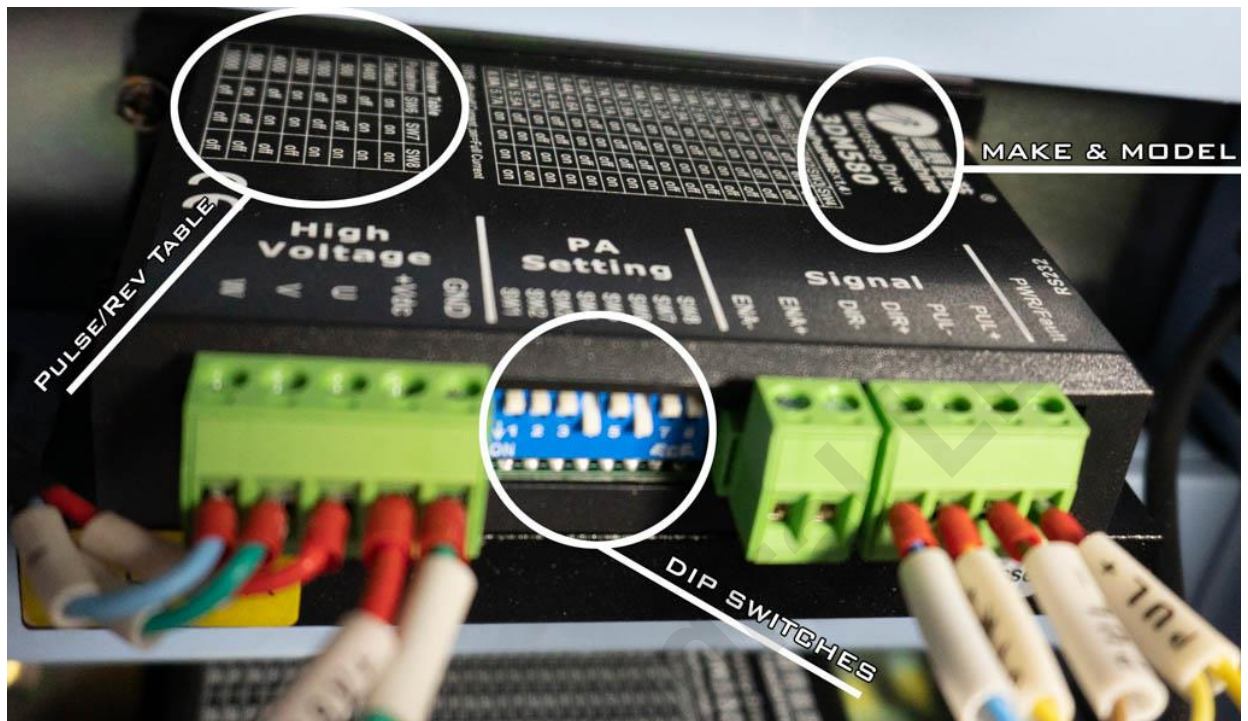


Figure 19. A close look at the stepper driver

There are 8 **DIP switches** on this driver, SW1 - SW8. Switches 4 (SW4) and 6 (SW6) are turned on (flipped down), while the rest are off (flipped up).

This driver has **Pulse/Rev** Table printed on it, so we don't need to know its manufacturer and model (no need to look at the manual).

The table refers only to SW6, SW7, and SW8 positions. In our case, **SW6** is **ON**, and **SW7** and **SW8** are **OFF**.

This combination shows that our **Pulse/rev** value is **5000**.

This is your **"Steps Per Rotation"** setting!

## Chapter 4: Configuring Software

Now that we know the Diameter and Steps Per Rotation values, let's use LightBurn to configure your laser to use PiBurn.

Note: Boss Laser HP Series machines cannot be configured via Lightburn. See the instructions at the end of this chapter.

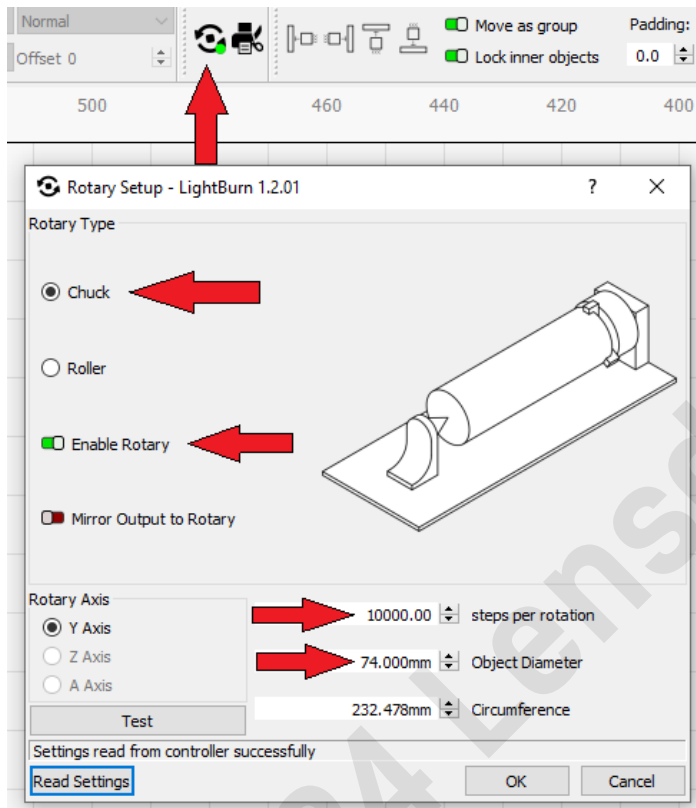


Figure 20. Lightburn Rotary Configuration

**IMPORTANT: Unlike “Roller” type rotary, “Chuck” type rotary’s Diameter setting is ACTUAL diameter of the object you are engraving! It will be different for every tumbler, cup, bottle, etc.!**

1. Following “Connecting PiBurn” instructions to position and plug in the rotary inside the laser machine, ensure the laser is on, the rotary is plugged in, and any required rotary switches are turned on.
2. In Lightburn, click on Rotary Icon or go to the Laser Tools menu and choose Rotary Setup (Ctrl+Shift+R on Windows)
3. Change Rotary Type to “Chuck.”
4. Click the “Enable Rotary” switch to make it green.
5. Rotary Axes should be set to “Y-axis” (for Thunder, it will be “A Axis”)
6. Change “Steps Per Rotation” to a value you determined from the previous chapter

7. Set “Object Diameter” to the diameter of your engraving object

Alternatively, these settings can be changed via Edit -> Machine Settings and then under Rotary Parameters. Your machine settings can be saved to a configuration file, which is very convenient when you want to switch between flat and rotary work and between different diameter objects without actually remembering any numbers! Some laser manufacturers will include settings files on a USB drive.

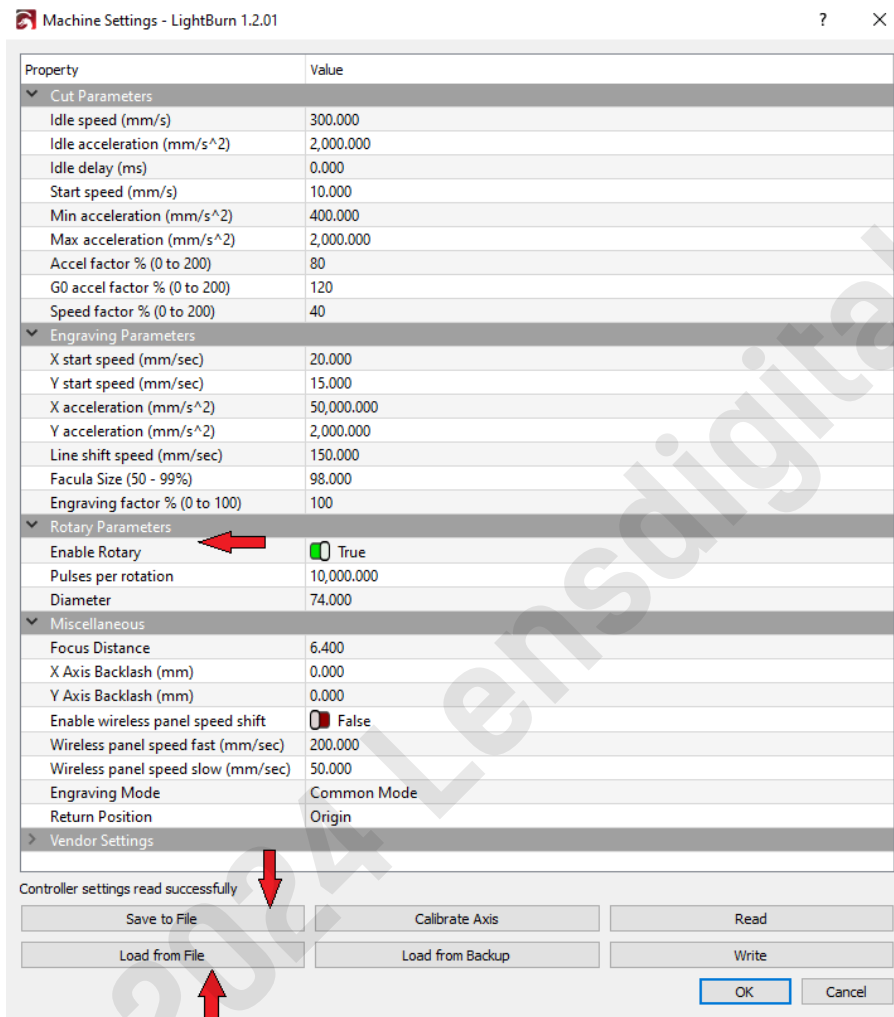


Figure 21. Machine Settings

## Boss HP machine setup

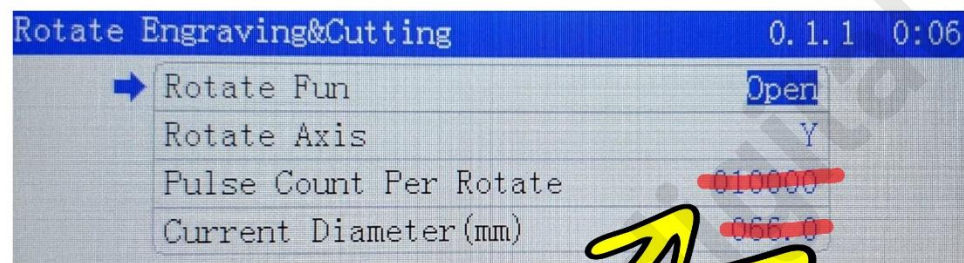
These lasers use a different controller. Lightburn is unable to change rotary settings on it, so it has to be done from the laser's control panel:

### Setting up in LaserCAD (HP Machines)

On the AWC Control Panel, press the **Menu** button, then go to:


**7. Common Parameter Settings > Press Enter > 4. Rotate Engraving&Cutting > Press Enter**

The following picture shows that **four parameters** that need to be adjusted



To use the **Roller Rotary**

- **Rotate Fun** – Open
- **Rotate Axis** – Y
- **Pulse Count Per Rotate** – 005000 (5000)
- **Current Diameter (mm)** – Actual Cup Diameter

 **NOTE:** You will need to **RESET** the machine (Turning off/on the machine or pressing the **RESET** button) after you've made changes!

To go back to the worktable, change the **Rotate Fun** to **"Close,"** then press the **Enter** button.  
Then **RESET** the machine to save changes to the machine.

Figure 22. Boss HP laser config

## Chapter 5: Basic Operations

### Adjusting Height and Tilt

#### Changing Grip Position

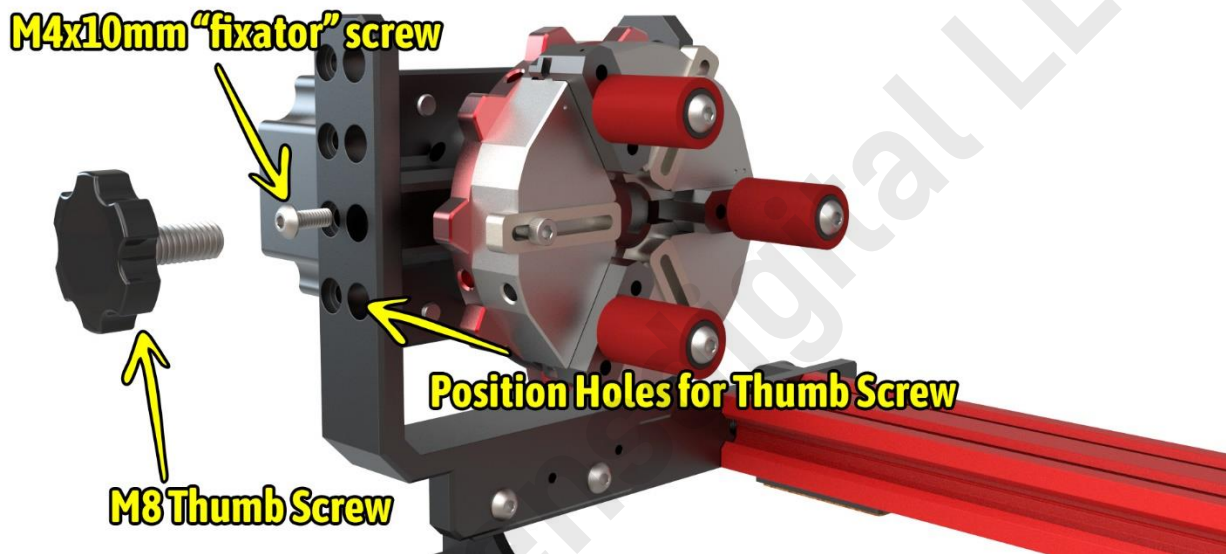


Figure 23. Adjusting Height

PiBurn Grip head unit can be raised or lowered in its Universal Bracket to accommodate various size objects.



Figure 24. Universal Bracket

The universal bracket has a set of holes (4) to secure the Grip. Note that there are two hole sizes. The large one is where you will insert a large M8 Thumb Screw to hold Grip in place. The smaller hole can be used optionally with an M4x10mm button head "fixator" screw to prevent the grip from tilting if desired. Note that if you decide to use a "fixator" screw, it must be installed before the big Thumb screw because it goes under it.

Your Grip will ship with fixator screws installed. If you desire to adjust the grip position, remove Thumb Screw on one side and remove the M4x10mm fixator screw, then repeat on the other, making sure you hold the



grip with your hand so it doesn't fall. Now lift or lower it desired position (make sure that the hole in the universal bracket and grip threaded hole align and install the Thumb Screw (or both the fixator screw and Thumb screw if desired).

To adjust the Tilt, remove both "fixator" screws first. Then loosen up the thumb screws, set the needed tilt angle and tighten them back.

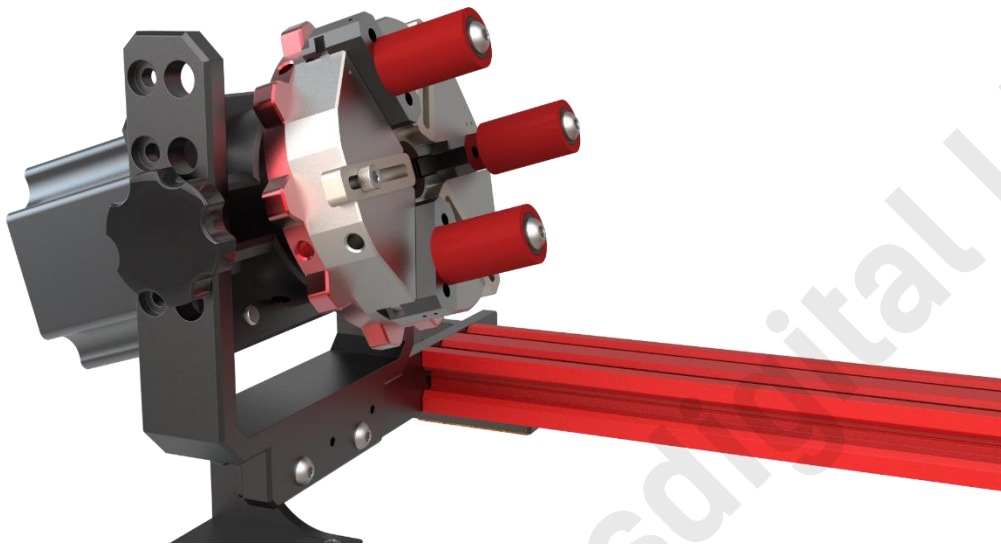


Figure 25. Adjusting Tilt

There's an excellent trick for doing it with the help of back wheels:

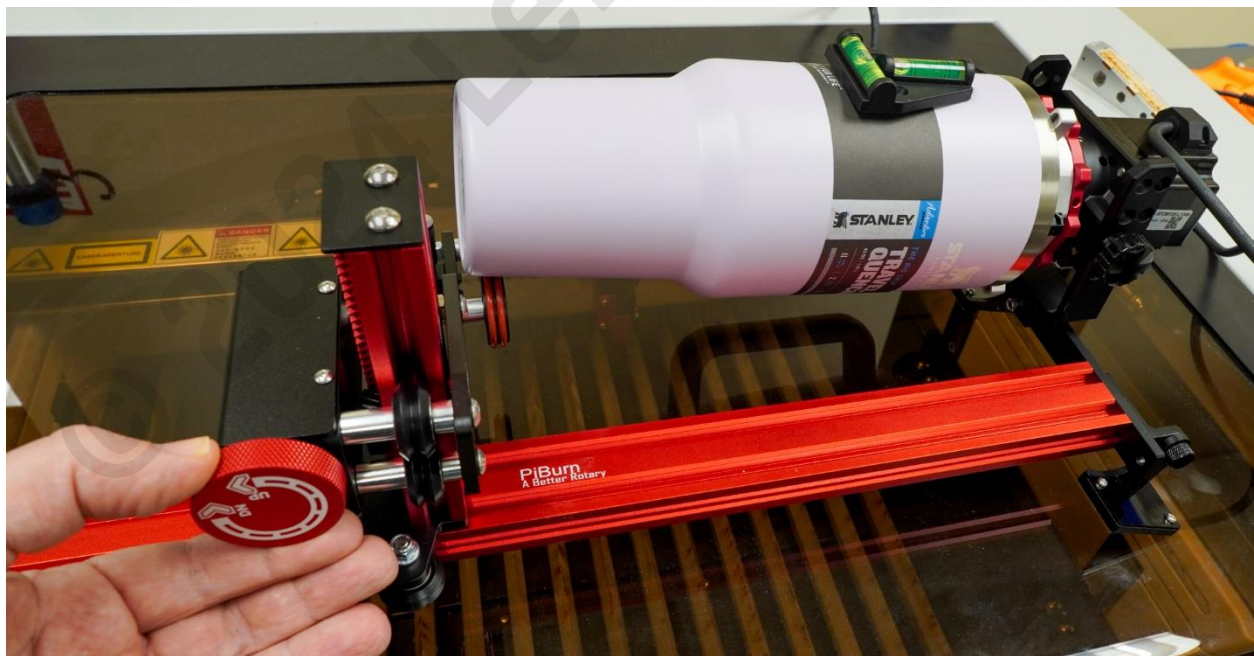


Figure 26. Leveling

1. Completely loosen up thumb screws so grip and swivel easily

2. Insert the object into the jaws and tighten them.
3. Place the other side of the object on the back wheels.
4. Place a bubble level on top of the cup and start raising the back wheels with the hand.
5. Once level, tighten the big thumb screws to secure the grip position.

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## Using Grip Jaws

Please check the video on how to use jaws for better understanding.

[https://youtu.be/\\_Puvsw5fdzY](https://youtu.be/_Puvsw5fdzY)

Your PiBurn Grip will come with several sets of “jaws” to hold round objects. There are so many combinations that can be used that we can’t list them all, but we’ll describe the most common setups. Feel free to find your new way of using these!

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## Base Jaws

### BASE JAWS

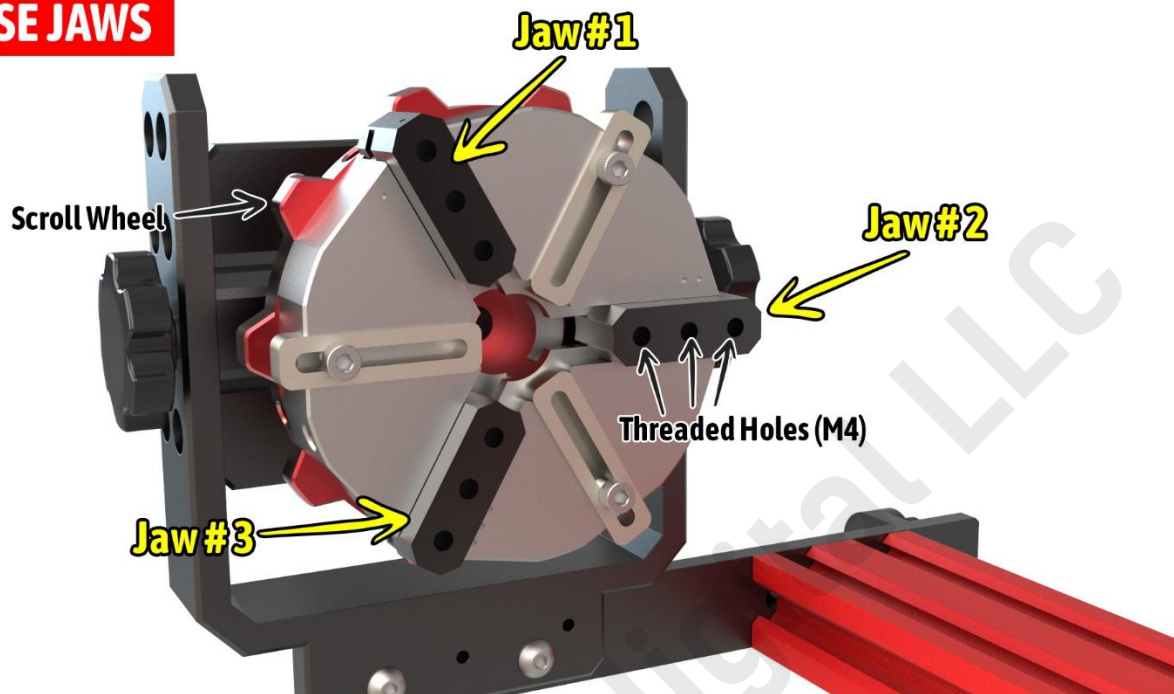


Figure 27. Base Jaws

These jaws are used as attachment points for all other (external) jaws on the grip. Each has three threaded M4 holes used for external jaw attachments. You will choose which holes to use based on the diameter of your engraving object.

Base jaws should not be removed from the grip housing; however, they are removable and can fall out if you open the grip too far. Don't worry; just like with any chuck, these can be easily inserted back.

Look at Grip's housing. It has a dot on top indicating which jaw goes into which groove. Each jaw has a corresponding set of dots from 1 to 3. It's essential to install these jaws in the correct order.

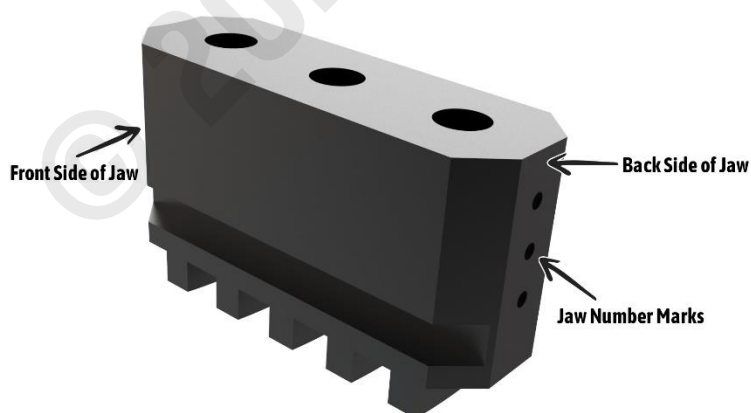


Figure 28. Base jaw closeup

Base jaws need to be installed in the correct direction. The back end of the base jaw has indicator dots, front does not! Always install them with the front end towards the center of the grip.

Refer to the installation video: <https://youtu.be/69tPfSy1xuc>

The scroll wheel has a groove on it. This is what grabs and moves jaws.

1. Let's start with the first jaw. Rotate the scroll wheel counterclockwise while looking into the first jaw's channel (marked with one dot). At some point, you will see the tip of the spiral groove.



Figure 29. Scroll Wheel

2. When you see it, rotate the wheel a little bit more until the end of the groove disappears. Insert the first jaw into the slot (make sure the marking dot is visible on the back end of the jaw) and start turning the scroll wheel clockwise. Groove will catch the jaw and start moving it forward.
3. Look at the second channel (marked with two dots), and turn the scroll wheel a little more until you see the tip of the spiral groove. Just like with 1<sup>st</sup> jaw, turn it back slightly until the tip of the groove disappears and insert jaw #2 (one with two dots). Turn the scroll wheel clockwise until the groove catches the second jaw.
4. Perform the same task with Base Jaw #3.
5. Keep turning the scroll wheel and make sure that all jaws move easily and evenly. They should meet in the middle at the same spot. If they don't, remove them, check if you inserted them correctly, and repeat the process.

Note: It's perfectly fine that these jaws feel loose. It doesn't affect the functionality of the grip.

## Finger Jaws

### FINGER JAWS

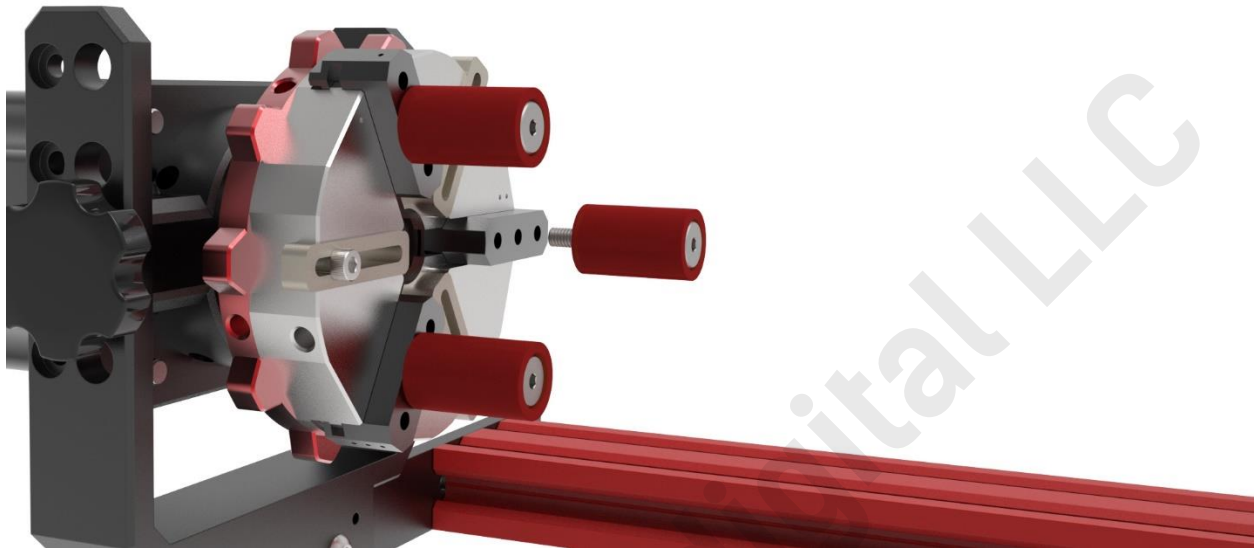


Figure 30. Finger Jaws

Finger jaws have silicone sleeves that provide excellent grip on most objects and are gentle on glass. They can be used for most of the objects you will be engraving; in most cases, you will be using them to hold round objects from the inside. These jaws can be used on the outside for objects that are not hollow inside, like baseball bats.

Finger jaws come in two lengths: Regular and Short.

Regular finger jaws are great for straight objects and can better hold heavier objects like glass beer mugs.

Short Finger Jaws are great for tapered objects and tumblers with an inner ridge that will prevent regular finger jaws from engaging. Great examples are 20 and 30-oz tumblers such as Polar Camel and Yeti.

Finger jaws screw into one of 3 holes in the base jaws. These jaws do not require any tools to install.

Whenever possible, use the middle hole to attach these for the most versatility.

Metal “L” jaws

## METAL JAWS

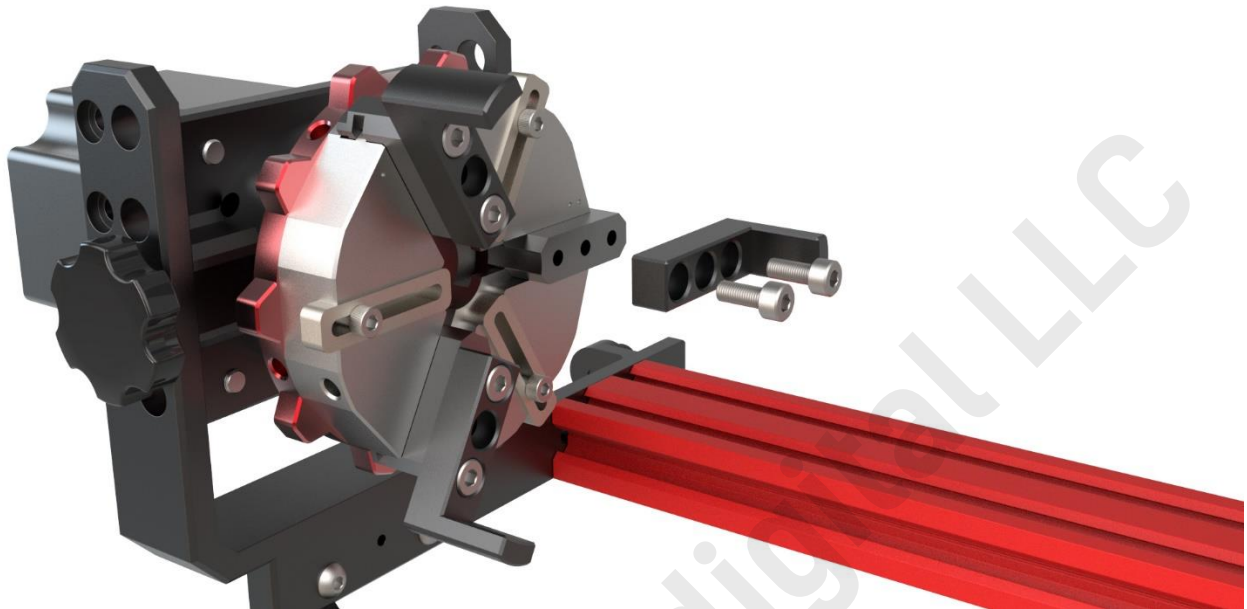


Figure 31. Metal jaws

These jaws resemble “classic” chuck jaws you might have seen on other chucks. We designed these with a few things in mind. In most cases, you will want to use them on the outside. The length of the part that grabs the tumbler is designed to fit just over the stainless “ring” portion of the tumbler, so you can still engrave most of the powder-coated surface. And the thickness of these is also made so most laser heads can pass over them and avoid collision because the laser head will need to move a little past the engraving area due to the inertia.

We tested these on 20 and 30-oz tumblers, and they work great! But they will hold many other objects! You can also flip them around to hold very small objects like pens.

Use 6 included M4x10mm socket cap screws to install these on the base jaws. You only need to use two holes out of 3.

Use a 3mm Hex Wrench or Screwdriver for these.

## Extended Jaws

### Extended Jaws

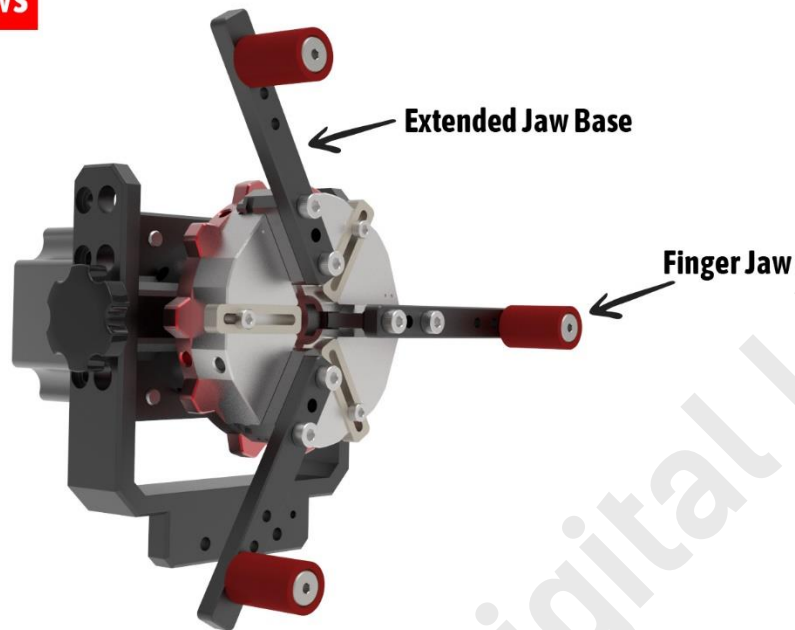


Figure 32. Extended jaws

These are special jaws never seen before on a rotary chuck! Also known as “dog bowl jaws,” they significantly increase the grip jaws’ reach to hold bowls and other large objects.

Take a closer look at these. You will see a set of holes on both ends. Some of these have threads of them; some are not threaded. You will attach these extended jaws to base jaws thru unthreaded holes. Use



included M4x10mm socket cap screws (2 per jaw) to attach them on the base jaws. Now you can install your finger jaws into one of the threaded holes on the opposite end. Use a hole that works best for your object.

You can even install L-Jaws on the extended bases!

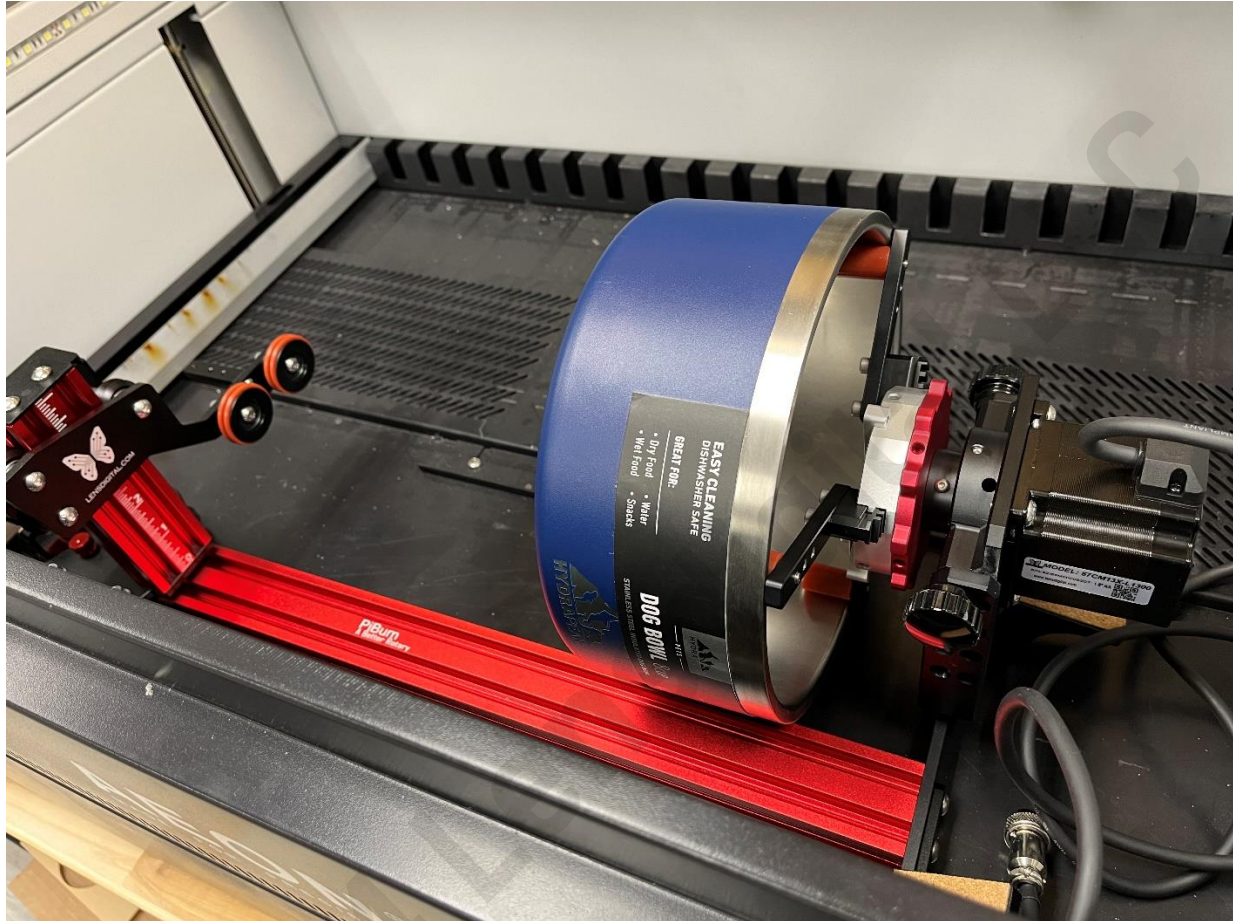


Figure 33. Dog Bowl in Extended Jaws

## Adjustable Cup Stoppers

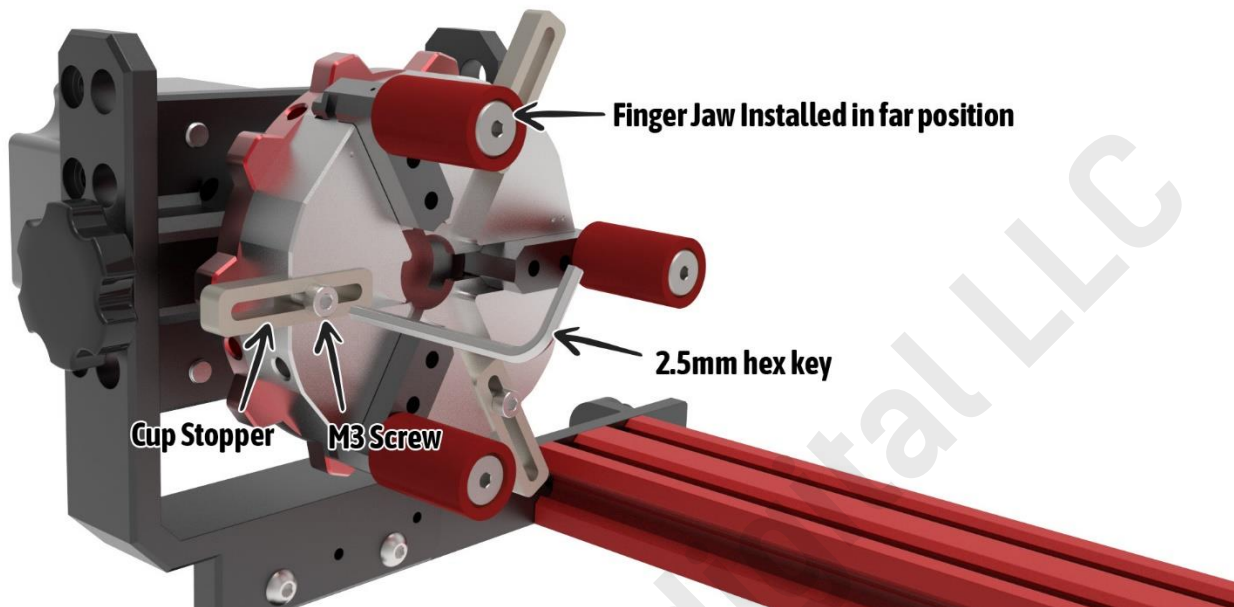


Figure 34. Cup Stoppers

When you install “finger” jaws in the outermost hole of the base jaws (i.e., when setting up for larger diameter tumblers), there won’t be enough of the edge of the base jaw to stop the tumbler from moving past them. It will be virtually impossible to align the tumbler to be parallel to the grip’s face. In this case, you can extend adjustable cup stoppers. You can move each stopper out of its slot by loosening up an M3 screw with a 2.5mm Allen wrench or hex screwdriver. Extend these so that the edge of the cup or tumbler can make complete contact with each of the three stoppers, and tighten the back M3 screw.

When not needed, retract all three stopper arms so the laser head won't collide with them. IMPORTANT: Don't retract them too far, or they will block Base jaws from moving all the way to the center.

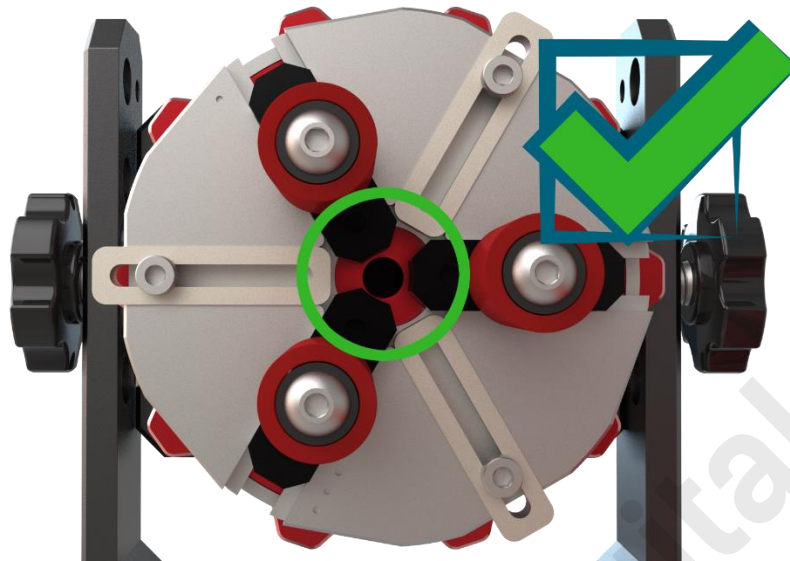


Figure 35. Stoppers Position

#### Using Levers

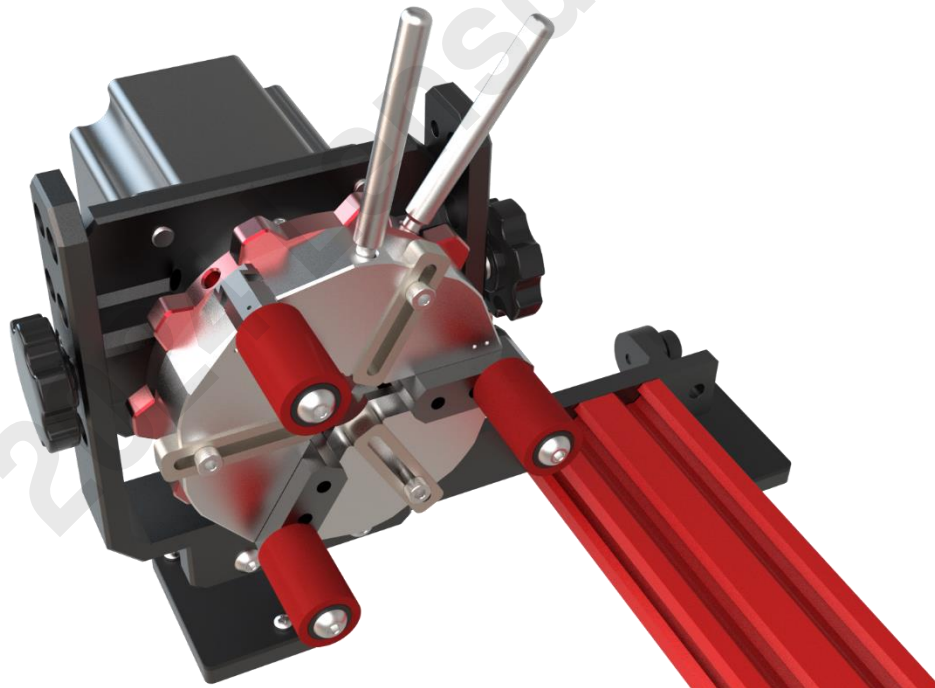


Figure 36. Levers

You can secure most objects by hand. However, in some cases where you might need extra tightening, you can use included Levers. Insert one into the hole on the grip body and the second one in the hole on the scroll wheel. Please do not use excessive force.



## Securing Object in Jaws

Decide which jaw set and position will work best for your object. Also, decide if you want to secure your object from inside or outside. Whenever possible secure it from the inside. Rotate the scroll wheel until the jaws are close to touching your cup or tumbler.

For these instructions, let's assume you are using your grip with the motor facing the right side.

When securing an object from the inside, you spread your jaws apart and turn the scroll wheel counterclockwise. To release the object, spin the wheel clockwise.

When securing an object from the outside, you move the jaws toward the center and turn the scroll wheel clockwise. To release an object, spin the wheel counterclockwise.

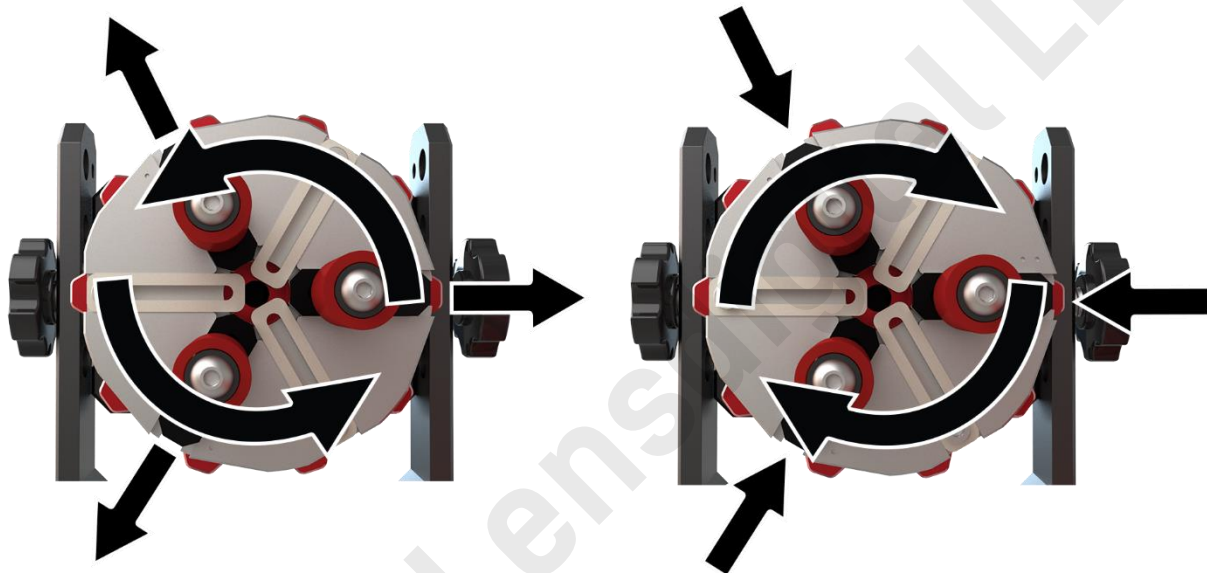


Figure 37. Clamping

If you want to secure your object (i.e., cup or tumbler from inside), look at the object's inner diameter and see the best jaw position. When using finger jaws in the middle hole position, insert your cup or tumbler on the grip and extend the jaws until your object's edge is evenly touching the surface of all three base jaws. If your finger jaws are installed in the last outer hole, extend stoppers and insert your object until its edge touches all three stoppers. Now start turning the scroll wheel away from you (counterclockwise) while firmly holding the cup or tumbler to the grip's base jaws (or stopper arms). You want the grip's silver housing to be stationary while turning the scroll wheel.



Figure 38. Securing Cup

This might take some practice; either hold it with the tips of fingers of your left hand or use your fingers on your right hand to turn both grip housing and scroll wheels in opposite directions. For example, push on the scroll wheel's protrusion with your thumb and pull the edge of the base jaw or stopper arm with your index finger in the opposite direction. Try it a few times, and you'll quickly find the best way to do this as your fingers develop "muscle memory." You might also find that levers help you accomplish the same task more naturally.

## Chapter 6: Getting Help

The best place to get a quick answer to your question is on our Official Support Facebook page, “PiBurn Labs.”



<https://www.facebook.com/groups/996618140714203>

To reach us, please open a helpdesk ticket by going to our website and either clicking on the Green "Help" icon on the bottom right corner of the page or clicking on the Contact Us link located on top of the web page (it's nested inside "About Us" menu). Please remember to specify your order number.

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