

RapiLaser

USER GUIDE



Design, control your machine and engrave — all from the browser.
For diode laser machines with GRBL 1.1 firmware.

Contents

1. Before you start
2. What RapiLaser is and what you need
3. Your first connection
4. The two screens
5. The Editor: designing
6. Layers: power, speed and passes
7. Text and images
8. Outline: the edge to cut the piece along
9. Vectorize: turning a photo into paths
10. The Personalizer: one design, many pieces
11. Files: saving, importing and exporting
12. From design to machine
13. Lining up the job with the material
14. Two aids so you do not engrave blind
15. Before starting a job: air and focus
16. Engraving
17. Rotary mode: engraving tumblers and cups
18. When something goes wrong
19. Your access code
20. Support
21. Legal notices

Before you start

This guide takes you from turning the machine on for the first time all the way to engraving a tumbler. It is written for people who have never used a laser: if something seems obvious to you, skip it. RapiLaser can be used in English or in Spanish, and this guide writes button and menu names exactly as the application shows them in English. To switch languages, use the flags in the top bar (see “The two screens”).

But do not skip this first page.



A diode laser cuts, burns and can blind you

This is not a formality. The beam that engraves a board also goes straight through an eye, and the damage is permanent and instantaneous. Blinking will not protect you.

- ALWAYS wear the safety glasses that came with your machine whenever it is switched on, even if you only want to ‘see where it points’. Sunglasses do not work.
- Never leave a job running unattended. Engraving can set the material on fire, and it happens in seconds.
- Ventilate. The smoke from some materials is toxic — PVC, for one, releases chlorine and also corrodes your machine.
- Keep a fire extinguisher at hand. Not under a piece of furniture: at hand.
- Never engrave materials you do not know. If you do not know what it is made of, do not put it in.

The first time you open RapiLaser you will see a screen titled “Before you start: laser safety”, and you will have to tap “I understand and accept” to continue. It is not a formality: read it.

Unplugging the cable does NOT stop the machine

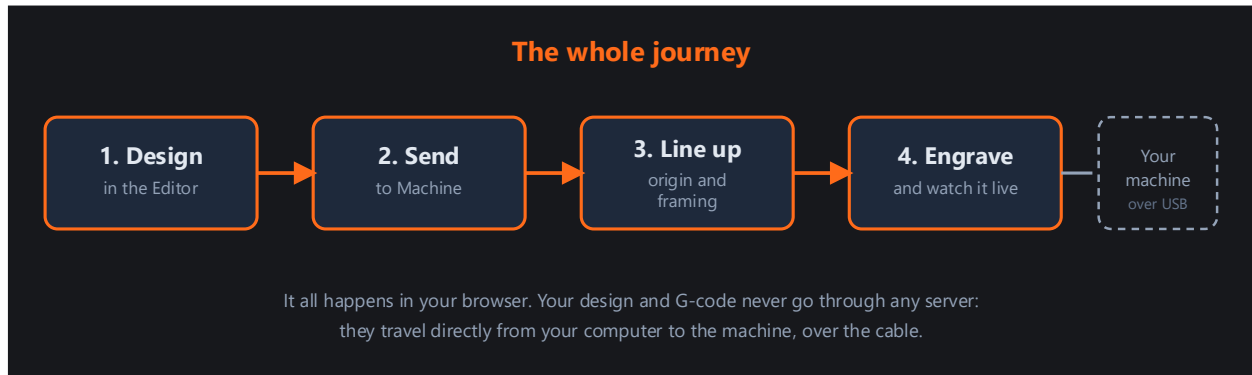
This surprises everyone, so it is better to know it before than during. Your machine stores ahead of time the commands it is about to run. If you disconnect the USB in the middle of a job, it keeps moving and burning with what it already has stored — on modern boards that can be more than a minute.

The only real stop is RapiLaser's STOP button, and it needs the connection to still be alive. Find it now: it is always at the top, in red, on every screen, and it stays there even when you scroll the page.

If the application stops responding with the laser on, switch the machine off with its own power switch.

What RapiLaser is and what you need

RapiLaser is a program that runs inside your browser. Nothing gets installed: there is no program to download, no app from a store and no extension. With it you design what you want to engrave, and from that same place you control your laser machine and run the job.



Your design never leaves your computer

It is worth knowing because it changes what you can expect. All the heavy work —drawing, calculating the toolpath, sending the commands— happens in your browser. Your design and the file the machine runs travel directly from your computer to the laser, over the cable. They do not go through any server.

That has two practical consequences. The good one: if the internet drops in the middle of a job, your engraving keeps going. The other one: your projects are saved inside the browser on THAT computer, so they do not show up on another one by themselves. To take them with you, you export them to a file.

Which machines work

Diode laser machines with GRBL 1.1 firmware, which are the vast majority of those sold for home and workshop use: Atomstack, Sculpfun, Ortur, Creality Falcon, TwoTrees, Longer, NEJE, Comgrow and about a dozen more.

The newer xTool models and LaserPecker do not work: they use a closed protocol of their own.

⚠ The connection is ALWAYS through a USB cable. There is no WiFi, no local network and no Bluetooth.

Which browser and which device

Can your device talk to the machine?
Check it on the Diagnostic page before anything else. It is public: no code needed.

Works	Does not work	The most common failure
Chrome or Edge on Windows, Mac or Linux	Firefox · Safari iPhone · iPad	The CHARGE-ONLY OTG cable
-----	-----	It looks the same, costs less and carries no data: the phone sees nothing and it looks like the app is broken.
Chrome on Android with a DATA OTG cable	Not our choice: those browsers do not allow USB.	

If you cannot connect on an iPhone, you can still design:
prepare the job there and run it from a computer or an Android phone. The design is saved in each device's browser.

Before buying or setting up anything, open the Diagnostic page. It is public, it does not need an access code, and in a few seconds it tells you whether your device can talk to your machine. On rapilaser.com there is a button that takes you there: “Check if my device is compatible”.

The answer is at the very top and spelled out: “Good news — your device works with RapiLaser!” in green, or “Sorry, your device does not work with RapiLaser” in red, with the reason underneath. If the reason is that you came in through an address without the padlock, it says so: in that case the problem is not your device, it is the address.

There you will see the “What this browser supports” panel, with seven rows. The ones that decide are “Web Serial (serial port)” on a computer, “WebUSB (USB port on Android)” on a phone, and “Secure context (HTTPS)”. Below, “Chosen medium” tells you which one the application will use.

⚠ On iPhone and iPad it is not possible to connect the machine, and switching browsers does not help: Chrome and Firefox on iOS use the same engine as Safari. It is a restriction imposed by Apple. You can design on the iPhone and run the job from another device.

Tip • The diagnostic also reports “Project storage”. If it says “ERASED when you close the window”, you are in incognito mode or almost out of space: export anything you do not want to lose.

Your first connection

Step 1 — Turn the machine on BEFORE connecting

⚠ This order matters and almost nobody knows it. On most of these machines the USB chip is powered by the machine's own power supply: if the machine is off, your computer does not even see the port. If you turn it on afterwards, you have to try connecting again.

Step 2 — Plug in the cable

Use the USB cable that came with the machine. On Android, an OTG adapter.

⚠ THE CABLE IS FAILURE NUMBER ONE. Many USB cables and many OTG adapters only CHARGE and do not carry data. They look identical and cost less. With one of those, the browser's list comes up empty and no error explains why. Before you think something is broken, try another cable.

Step 3 — Tap “Connect”, the green plug

On the Machine screen, if your browser is compatible, you will see the “Connect your machine in 4 steps” assistant, which walks you through it. The steps get ticked off by themselves based on what the machine actually reports, not on your clicks: if something fails, the step is not ticked.

“Connect” is the green plug button in the top bar, next to the sun; its name shows when you hover over it. When you tap it, the BROWSER shows you its own list of devices. Pick yours — it usually shows up as “USB Serial” or with the name of the chip, normally CH340. That permission is granted by the browser, not by us, and it is only asked for once per computer.

If the list comes up empty: check the cable, check that the machine is on, and on Windows check that you have the CH340 driver installed. You have to get that driver separately; RapiLaser mentions it but does not install it.

⚠ THE LASER HEAD MAY MOVE BY ITSELF WHEN YOU CONNECT. As soon as you tap “Connect”, a seven-second notice appears that says “⚠ The machine is restarting for safety: the head CAN MOVE BY ITSELF to the corner. Keep your hands away until it stops.” It is true and it is not a fault: the first thing we do when connecting is clear the machine's memory, and several brands respond to that by sending the head to its corner. We do not order that; their firmware does it. The notice also appears when the connection comes back by itself after the cable gets tugged, and on the Diagnostic page. It does not cover the STOP and it can be closed.

Step 4 — Let it identify itself

RapiLaser asks the machine who it is and how it is configured. You will see these states go by: "Opening the port...", "Identifying the machine...", "Reading its settings..." and finally "Connected and ready".

From then on, an indicator tells you at every moment what the machine is doing — "Idle", "Running", "Paused", "Locked for safety", "Lid open"... — and each one comes with a sentence that explains what it means.

The safety check

When you connect, we check a setting on your machine called laser mode. If it is off, your machine would fire the beam while moving without engraving: it would burn lines where it was only supposed to travel. If we find it off you will see "Safety check" with the button "Turn on laser mode (\$32=1)".

⚠ Without that setting no job runs. That is deliberate.

Tip • It is the only setting on your machine that RapiLaser touches, and only if you ask for it with that button. We never change anything on our own.

The access code

The Editor and the Machine screen ask for your license code, in the form RAPI-XXXX-XXXX, on the "Enter RapiLaser" screen. The diagnostic does NOT ask for it, on purpose: anyone must be able to check compatibility before anything else. To leave, "Sign out" is in the top bar.

The two screens



The whole application is two screens, and you move between them with the top bar. That bar stays fixed at the top even when you scroll the page, on a computer and on a phone, so the STOP is always in sight. The application is in English and in Spanish. It opens in your browser's language—in English if your browser is in English, in Spanish otherwise—and you switch it with the flags in the top bar, next to the tabs: the flag of Mexico for Español and the flag of the United States for English. Except on very wide screens (1536 pixels or more), and also on a phone, only the flag of the other language shows: the one that switches it. The choice is remembered in that browser. Switching languages does NOT translate what is already inside a design: the names of your layers, the labels of a material test card created in Spanish and any text you typed stay as they were created, and the comments inside the G-code are always in Spanish, whatever the language on screen.

In the EDITOR you draw and decide what gets engraved and how. In MACHINE you control the device and run the job. Several important controls—connecting, the origin, the Pointer, the Head tracker, Rotary mode, and the Start, Pause and Resume buttons—are on both, so you do not have to go back and forth.

In the Editor those machine controls appear in the toolbar when the machine is connected, and they come in the order you use them: “Origin 0,0”, “Set origin here”, the “Head tracker” and the “Pointer”, and behind them the “Rotary”. The first four are the sequence for lining up the material—I set the zero, I correct it while looking at the design, I see where the head goes, I see where the beam points—the Rotary is not part of that series, it is a machine mode you turn on once, when you mount the accessory.

The bar also has “User Guide”, which opens this guide in a new tab, with its contents and its search (rapilaser.com/en/guide); right next to it, “PDF” downloads it so you can print it or carry it offline. And at the end, “Sign out”, which on a phone and on medium-sized screens is only the icon of a door with an arrow; its name appears when you hover over it. The Diagnostic is NOT a tab: it is a separate, public page, at app.rapilaser.com/diagnostics, which the button on the rapilaser.com home page also takes you to.

To write to us there is “Problem or suggestion?”, with a speech bubble and a question mark. It lives ALWAYS in the top bar, between the Guide’s “PDF” and “Sign out”, so it is the same in the Editor and in Machine. On a phone and on medium-sized screens only the bubble stays, and the name appears when you hover over it. When you tap it, it offers two options, “Report a problem” and “Request an improvement”. With your license active, each one opens a form at the bottom of the screen, which does not cover the STOP, with an Español / English selector. You write what happened or what you would like, and, if you want, a contact email. When you report a problem, the version, the screen, your device and your machine’s data at that moment are attached, with the last lines it ANSWERED; when you request an improvement, only the version, the screen and your device. Your design, your images, your G-code and what the application sends to the machine are never sent, and before sending, the checkbox you tick to agree tells you point by point what gets attached; the full detail is in the privacy notice, linked right there. When you send it you get a reference number and, if we have an email for you, a confirmation arrives in the language you chose. You can send up to three reports every 24 hours. Without a license, on the Diagnostic page, or if sending fails, it opens your email program with a message addressed to rapilaser@rapilaser.com, with the subject filled in and a few questions to answer.

The CONSOLE —what gets sent to the machine and what it answers— is on the Machine screen, at the bottom. That is where you see the firmware’s errors in its own words.

Sound

RapiLaser uses sounds to tell you what happens while you are not looking: that the machine connected, that the job finished, that it paused or resumed, that it went into alarm, that it rejected a command, and that you just closed a shape. An engraving lasts twenty minutes and almost nobody stays watching it.

The speaker button turns them off and on. In the Editor it is in the toolbar, near the zoom button; in Machine, in the “Job” panel, next to “Laser enabled” and “Head tracker”. It is on by default. When muted, NOTHING sounds, not even the alarm.

The Editor: designing

The toolbar

First come the DRAWING tools: "Hand", "Rectangle", "Ellipse", "Polygon", "Line", "Curve", "Pencil" and "Text". You tap the tool and then drag on the canvas to draw at whatever size you want. When you let go, it goes back to selection mode by itself.

The "Hand" is the exception: it does not draw, it drags the view. It exists because on a trackpad there is no comfortable middle or right button, and without it there was no obvious way to move around.

At the end of that SAME row, right after "Text", is the paint bucket; its tooltip calls it "Fill bucket". It does not draw: it stays on, and the next tap on a shape adds or removes its fill. Look for it there, among the drawing tools, and not among the buttons that come afterwards.

Tip • With the bucket on, the cursor changes to an arrow with a drop. The TIP of that arrow is the exact point that will be filled: the bucket does not fill the shape you touch, it fills the closed area around that point.

⚠ CONFUSION NUMBER ONE: with a drawing tool armed, a click does not select: it places. But only once — when you place the shape the tool switches itself off and you are back to selecting. The ones that do NOT switch off by themselves are the "Hand" and the paint bucket: they stay on until you tap them again. If you feel the canvas 'does not respond', look at the bar: the tool that is on shows in orange. Escape switches off whichever it is.

The ARROW, at the start of the row, is the selection tool, and it is the one the editor switches back to by itself when you finish drawing. You can also get there by tapping it. The "Polygon" comes with two buttons, "One more side" and "One less side", to choose the number of sides BEFORE drawing; it can also be a star. The "Curve" is a simple arc: you mark the start and the end, and then drag the handle to give it its curvature.

THE POLYGON BECOMES FIXED WHEN YOU LET IT GO. While it is still selected right after drawing it, you can change its sides, make it a star and adjust its radius, and it has four handles at the corners to scale it without distorting it. As soon as you deselect it, it turns into a fixed shape: you can no longer change its sides, but in exchange it gets all eight handles—including the middle ones—and you can stretch it wider or taller like any other shape.

Tip • If you let it go too early, Ctrl+Z gives you back the polygon with its sides again.

After that come the buttons that WORK ON what you already drew, in this order: "Undo", "Redo" and "Delete the selection"; then, after a thin divider, "Copy", "Center horizontally", "Center vertically", "Mirror horizontally", "Mirror vertically", "Group", "Ungroup", "Arrange"—which opens a menu with the four ways to change what sits on top—, "Outline for cutting", "Vectorize image", "Cut out piece",

"Merge shapes", the "Material test" and the "Personalizer". Almost all of them are disabled when using them makes no sense, and their explanation appears when you leave the cursor over them.

Picking what you want, and only that

With the arrow on, a click picks the object on TOP. If what you were after is underneath, click again ON THE SAME SPOT: each click goes down one more, and when it reaches the bottom it starts again from the top. It is the way to get to a covered shape without moving the one on top.

- Ctrl and a click ADD to what you already had selected (on a Mac, Cmd). Shift does the same.
- With the Z key held down, a click REMOVES from the selection; on something that was not selected it does nothing. It is useful for building a large selection and then taking one piece out of it.
- Dragging over empty space draws a box, and it takes whatever lies ENTIRELY inside. Anything it only touches does not get in, so you can enclose a piece tucked in between others.

Tip · While you hold the Z key down you cannot type into a selected text: let go of it and you are done. It is the price of having 'remove' on a single key.

Freehand drawing

The "Pencil" tool draws freehand: you drag and the path stays. Your hand's shake is not stored point by point — the path simplifies itself, keeping the points that really describe the shape.

The pencil does NOT snap to the grid, on purpose: doing so would mean fighting your hand. And if you finish the path close to where you started it, the shape starts out already closed.

The canvas

The canvas represents your machine's work area in real millimeters. The rulers along the edges tell you where everything is.

- Mouse wheel: zooms in and out. The point under the cursor is brought to the center of the screen.
- Middle button or right button, dragging: moves the view.
- On a touch screen: pinch with two fingers.
- The "Hand" tool drags the view with any pointer, including your finger and the trackpad.
- You can move the view until the far corner of the work area sits under the rulers — handy for working comfortably on something close to the bottom or right edge. On the origin side it does not move: no gap ever opens between the corner of the work area and the rulers.
- The button that shows the percentage brings the view back to fit everything. If you overshoot while moving around and the work area leaves the view, that button brings you back.

- An object that goes outside the work area is marked in red and the notice “N outside the area” appears.

The canvas color

At the end of the top row, after “Send to Machine”, there are four little squares with a sample of each background: “Black canvas, as always”, “Light wood, balsa-like”, “MDF wood, darker” and “Pearl white”. They let you see how your design would look on the material. It is only a view: it does not change anything that gets engraved.

- On black, each layer shows in ITS own color, as always.
- On balsa, what you draw shows in midnight blue; on MDF, in black; and on pearl white, in lamp black. It is the ink that reads best on each material.
- The layers of a VECTORIZED image do not change with the background: they stay in their gray, because that gray is what tells you how dark each tone will come out.

Tip • On the three light backgrounds, the selection is marked in orange instead of light blue, which would not show there. For the same reason, what you are still drawing —the shape while you drag it, the pencil path, the dotted line when you move an end and the crop frame— comes out in midnight blue, almost black, and the big numbers that appear when you change the size come out in dark gray. And the background you choose stays set the next time you open the application on that computer.

Selecting and moving

- Click to select. Shift and click to add to the selection.
- Drag over an empty area to draw a marquee and select several.
- A design with a huge number of paths —a vectorized logo, for example— drags just as smoothly. While you drag it the selection box is not shown, and it comes back when you let go; and when you let go “Placing the design...” may appear for a few seconds while each path settles in.
- While you drag, rotate or scale something, Ctrl+Z, the keyboard arrows and the mouse wheel do nothing: they count again as soon as you let go. What you see when you let go is what stays; if you did not like it, let go and press Ctrl+Z, which undoes the whole move.
- Ctrl+A selects everything on VISIBLE layers. Anything on a layer with its eye turned off is left out.
- The keyboard arrows move the selection 1 mm. With Shift, 10 mm. With Alt, a tenth of a millimeter.
- Ctrl+C copies, Ctrl+X cuts and Ctrl+V pastes — also from one project to another.
- The “Copy” button in the bar leaves the copy already placed, shifted a little and selected, ready to drag. The Delete key removes it.
- Ctrl+D does the same as the “Copy” button.
- Ctrl+Z undoes and Ctrl+Shift+Z redoes, up to a hundred steps back.

⚠ On a phone there is no Ctrl+V, so you cannot paste from one project to another; you can duplicate with the “Copy” button, which is the common case.

⚠ There is no line width: the thickness you see on screen is only there so you can see it, and it does not change what the machine engraves.

Centering and grouping

“Center horizontally” and “Center vertically” line objects up WITH EACH OTHER, not against the work area, and they need two or more. The adverb names the direction they move in: “Center horizontally” shifts them left and right.

They are centered against the rectangle that encloses all of them —their bounding box—, which is what solves the real-world case: with a big panel and a small opening inside it, the bounding box IS the panel, so the panel does not move and the opening lands right in its center.

“Group” makes several objects get selected and move as one; “Ungroup” lets them go. An outline that closes groups itself, without you having to remember.

“Merge shapes” is something else, and it is best not to confuse it with grouping: it takes two or more closed shapes that touch and fuses them into ONE, with a single outline on the outside. Grouping keeps them separate and only moves them together; merging changes the geometry, and that is why the cut goes around the outside and not along the line where they touched. The holes that no shape covers are kept.

Also with Ctrl+G to group and Ctrl+Shift+G to ungroup.

What sits on top: the order

When two shapes overlap, one sits ON TOP of the other. The “Arrange” button in the bar changes that order for whatever you have selected: tapping it opens a menu with four options, from top to bottom: “Bring to front” puts it above everything, “Bring forward” moves it up one, “Send backward” moves it down one and “Send to back” leaves it below everything.

- An option that does not apply shows as disabled and tells you why when you leave the cursor over it: something already on top of everything cannot go any higher. If there is nothing to arrange, the whole button is disabled.
- The menu closes when you choose, when you tap outside it or with Escape.
- With the keyboard, without opening the menu: Ctrl+} to the front, Ctrl+] up one, Ctrl+[down one and Ctrl+{ to the back. Each shortcut also appears in gray to the right of its option. Each change is ONE undo step.

The order applies WITHIN EACH LAYER: what is at the back gets engraved first and what is at the front, last. It does not change the order of the layers, which is still set by the “Layers” panel.

Mirror

The two mirror buttons flip the selection: one left to right and the other top to bottom, WITHOUT changing its size. The axis goes through the center of the whole selection, so a drawing made of several pieces is flipped as a whole and not piece by piece in place.

Also with Ctrl+Shift+H and Ctrl+Shift+V.

IMAGES get flipped too, and they get flipped for real: what you see on the canvas is what the machine will engrave, and the same goes for their outline, their crop and the SVG file you export. A flipped photo does not move or change size.

⚠ Only TEXT stays as it is, and the notice tells you how many were left unflipped: its letters cannot be mirrored without ceasing to be letters.

The Properties panel

It is to the right of the canvas, above the "Layers" panel. On a phone both of them sit below the drawing, so you have to scroll down a little to see them.

With an object selected, the fields specific to its type appear at the top, and at the bottom the same ones always appear: "X" and "Y" —where it is—, "Rotation" in degrees, the "Snap to grid" checkbox, the "Layer" selector and the "Delete" button.

And what is specific to each type is this:

- Rectangle and ellipse: "Width", "Height" and the "Fill" checkbox. If the width and the height do not match, there is also "Make square (height = width)" —or "Make circle (height = width)" on the ellipse—, which makes them equal with one tap. It is the keyboard-free way: on a phone there is no Shift key to hold while you draw.
- Polygon: "Sides", with two buttons to remove and add sides; "Radius"; the "Star" checkbox; if you turn it on, "Inner radius"; and its "Fill" checkbox.
- Line: "ΔX" and "ΔY". That Δ is a Greek letter that here means 'how far it goes': how far the line runs across and up or down from where it starts.
- Curve: the same "ΔX" and "ΔY", plus "Curve X" and "Curve Y", which are the point the bulge of the curve GOES THROUGH.
- Loose path —the pencil's, the one that comes from an imported file, or a polygon that has already become fixed—: it tells you how many points it is made of, and it has its "Fill" checkbox.
- Image: "Width", "Height", the "Dithering" —with a note underneath about which one suits each material—, the "Crop" button, the "Image adjustments" section and the "Engrave preview" checkbox. "Remove crop" appears next to "Crop" only when that photo is already cropped.
- Text: the "Text" itself, the "Font" with its "From computer..." and "File..." buttons, the "Size", the "Alignment" and "Fill".

With SEVERAL objects selected the panel shows no numbers: only how many there are, “Snap to grid”, “Layer” and “Delete”.

And with nothing selected it does not stay empty either: it keeps the “Snap to grid” checkbox, which governs the next thing you draw, and reminds you of your machine's work area in millimeters.

Tip • A change is applied when you leave the field or press Enter — and each one counts as ONE undo step, so that Ctrl+Z does not erase your word letter by letter. And if you change your mind before confirming, Escape puts the field back to its previous value.

Resizing without distorting

The CORNER handles keep the proportions: the shape grows and shrinks without distorting. The MIDDLE ones stretch along a single axis, their own. It is the convention of any drawing program, and there is nothing to turn on.

If you really want to distort from a corner, hold Shift while you drag.

While you drag you will see TWO BIG NUMBERS on the canvas with the percentage on each axis relative to the size it had when you started. They help you land on 100%,100% when you did not want to change it, or on 50%,50% when you want exactly half. Under each percentage, in smaller type, the measurement in millimeters appears —the width under the X and the height under the Y—, which is what will end up in “Width” and “Height” when you let go.

Snap to grid

The “Snap to grid” checkbox makes what you draw and move stick to the lines of the grid. Since the grid adapts to the zoom, the magnet gets finer the closer you zoom in.

It lives in the Properties panel, and it is ALWAYS there, also when you have nothing selected: it governs the next thing you draw, not only what is already there. It comes turned on, and it remembers what you choose — if you turn it off, it is still off the next time you open the application on that computer.

Editing a line by its ends

Select a line or a curve and you will see a ring at each end. Drag a ring and that end moves while the other one stays still. That is stretching, trimming and rotating all at once: when drawing they are the same thing, moving an end.

While you drag, the original line stays in place and a dotted line shows you how it is going to look. The rings are see-through on purpose, so you can see the path underneath — which is exactly what you need to look at to line things up.

Joining ends and closing shapes

If you bring the end of a path within 1.56 mm of the end of another, they snap together by themselves and you will see the notice “The paths were joined”. While you drag, a green ring

appears over the point it is going to snap to, so you know what is going to happen before you let go.

The magnet OVERRIDES the grid: if there is an end nearby, the point goes there even if snapping to the grid would have taken it somewhere else.

Joining is not cosmetic: when the file is generated those two paths come out as one continuous route, without turning the laser off in between. When cutting, it is the difference between a whole piece and a weak spot.

And from the moment they join they move TOGETHER: you grab either of the two and both go. A Ctrl+Z undoes the join.

Tip • If you tap the notice while it is on screen, you undo that join without losing the path.

When the shape closes

When the join CLOSES the outline, a new shape is created. You will notice it by three things at once: a short tone sounds, the green notice “Closed shape: it is now one object and can be filled” appears, and the whole outline ends up selected.

- From that moment it moves as a WHOLE: you grab any of its paths and they all go together.
- And it can be filled like a circle or a square. Turn on the paint bucket and tap INSIDE the shape: the paths fuse into ONE filled shape.
- A Ctrl+Z undoes the whole closing, or gives you back the loose paths if you had already fused them.

Cutting out a piece and taking it with you

Select a CLOSED outline —a shape, a closed freehand path, or the paths that make up a shape— and tap “Cut out piece”. From every other shape, the part that was inside it is SEPARATED —like lifting a piece out of a jigsaw puzzle— and the shape you used as the cutter is used up, like a cookie cutter: it disappears from where it was.

Its SHAPE, on the other hand, goes with the lifted piece: what gets separated is a piece closed by that outline, not loose bits. The piece is also moved aside a couple of millimeters and left selected, ready for you to drag wherever you want it.

- The separated piece is shifted a couple of millimeters so you can see it, and it stays SELECTED: drag it wherever you want, or delete it with Delete.
- Texts and images are skipped, and the notice tells you how many. A text would have to stop being text to be cut; an image already has its own “Crop” in Properties.
- What survives are OUTLINES. If the shape that got cut had a fill, the part that is left no longer fills by itself: it is almost never a closed region.
- It works with anything: a loose line gets cut just like a circle.

⚠ Everything the shape covers gets cut, whether it is in front of or behind it in the drawing. A Ctrl+Z brings everything back at once.

Layers: power, speed and passes

Layers: a set of laser parameters

One drawing, two layers



outline = CUT letter = ENGRAVE

high power, slow, several passes low power, fast, one pass

What you decide on each layer

Power	how hard it burns (0 % = no mark)
Speed	slower = burns more
Passes	repeat the path, to cut
Line interval	line spacing when filling
Mode	engrave or cut

Layers run IN ORDER, top to bottom. Put the cut last: if you cut first, the piece comes loose and the rest comes out shifted.

A layer is a set of laser parameters. Everything you put on the same layer gets engraved the same way. The “Layers” panel is on the right, just below the Properties panel, with “+ Layer” to add one.

The typical case: one layer to engrave the drawing at low power and high speed, and another to cut the outline at high power, low speed, in several passes.

Which layer what you draw lands on, and how to change layers

In the “Layers” list there is always one layer marked: its background looks lighter, and it is the one whose parameters appear below the list. Everything you draw goes onto THAT layer. To change which one it is, tap its row before drawing.

To move something you have ALREADY drawn, select it and use the “Layer” selector in the Properties panel. That selector is the only way to change an object's layer: you do not drag them from one list to another, and there is no ‘move to’ button.

Tip • It works for several at once: select them all and choose the layer just once. If what you have selected is spread across different layers, the selector shows “—”; as soon as you choose one, they all go to it.

⚠ If something comes out engraved with a power or a speed you did not expect, first check which layer it ended up on. It was drawn on whichever layer was marked, which is not always the one you think.

What you decide on each layer

- “Mode”: engrave or cut.
- “Power”, as a percentage. At 0 % the path is traced without turning the laser on, which is useful for testing.

- “Speed”, in millimeters per minute. Slower burns more.
- “Passes”: how many times to repeat the path. It is what you use to cut thick material.
- “Line interval”: how close together the lines are when filling. Closer together is slower and darker.
- “Air assist”: whether the air pump should blow while this layer is engraved. The air pushes away the smoke—which, if it stays on top, absorbs part of the beam—and cools the material: less charring around the cut and cleaner edges. New layers start with the air turned ON.

⚠ Air from the application only works if your pump is connected to the machine's board. If you turn it on by hand with its own switch, this checkbox changes nothing. To find out, on the Machine screen there is the “Test air” button: it turns the pump on for four seconds and then asks you whether you heard it blowing. Check it BEFORE doing a material test with the air as an axis — if your pump does not obey, the with-air and without-air columns come out identical and you end up blaming the wood.

⚠ Sometimes you will see “(inherits)” in amber next to the name: it shows up in projects saved before this checkbox existed, and also on the layers that arrive when you import a LightBurn project. It means that layer says nothing about the air: the machine stays as it was, blowing or quiet, depending on what the previous layer left. One tap turns the air on for that layer; a second tap turns it off, and then it is an explicit ‘no’, which will switch the pump off when it gets there.

Tip • Decimals are written with a point: 1.5 is one and a half. You can separate thousands with a comma or not: 1,500 and 1500 are the same, fifteen hundred. Anything that can be read two ways is NOT accepted —1.500, which is fifteen hundred in Spain and one and a half here, or 1,50—, and neither is a number outside what is allowed, such as a power above 100 % or a speed above 100 000 mm/min: the field goes back to the value it had and tells you why. It works the same on layers, in Properties, in the material test, in the Personalizer and in Rotary mode.

Each layer also has a color—only so you can tell them apart on screen—and an eye to show or hide it. You change the color by tapping the circle, which opens eight colors to choose from; the name, by double-clicking on it.

Tip • If you hide the active layer, the active one moves to the nearest visible layer, so that what you draw can be seen. A hidden layer is not made active with a click while another one is visible: show it first with its eye.

⚠ ENGRAVING layers always run before CUTTING layers, wherever they sit in the list: if you cut first, the piece comes loose from the material and everything that comes after it ends up

shifted. Within the engraving, and within the cutting, the top-to-bottom order is respected, and you change it with “Move layer up” and “Move layer down”.

Tip • That is why you no longer have to remember to put the cut at the end of the list: RapiLaser orders it by itself when it sends the job.

⚠ “Delete layer” ALSO deletes all its objects. If it has objects we ask you to confirm; if it is empty, it is deleted without asking. Ctrl+Z brings it back, but only as long as you do not close the tab.

⚠ A HIDDEN layer is not drawn on screen and it is not engraved either: nothing of it goes into the file, even though it is still there. And if you hide ALL the layers that have something on them, “Send to Machine” is disabled, because for the application there is nothing left to engrave. If the button is gray and you do not understand why, check the layers' eyes. That is why nothing new stays tucked away on a hidden layer: if you paste, import or move something onto it, it becomes visible.

Fill

Rectangles, ellipses, polygons and texts can be filled. Turn on the paint bucket in the bar and tap a shape: it gets filled, or emptied if it was already filled. Escape switches it off. There is also a “Fill” checkbox in Properties.

With an outline made of loose paths —lines or curves joined by their ends— tap INSIDE the gap, as you would with any bucket. The paths fuse into a single filled shape, and a Ctrl+Z gives them back loose.

It also works if the outline MIXES a freehand path that closed by itself with straight lines hanging from its two ends —the scribble on top, the straight lines below—. Even if the scribble was already a closed shape, tap inside the lower part and the WHOLE body gets filled, just as you see it: the invisible line that closed the scribble does not split it in two.

Tip • The bucket fills the CONTIGUOUS space you tap: the tightest shape around the point and, with it, the shapes right inside it, which stay as holes. Tapping between a circle and the rectangle around it gives a donut; tapping inside the circle, only the circle.

That is how you check a design vectorized for cutting: tap the material and the whole piece gets filled, with its holes empty. Whatever does not get filled is a loose piece, which would fall out when cutting.

⚠ On a CUT layer, anything filled is also engraved, and at cutting power. If you filled only to check, tap again with the bucket to remove the fill before cutting; the bucket reminds you with a notice.

There is a detail people use a lot: a filled shape inside another filled shape, on the same layer, leaves a hole. A circle inside another circle is a donut. That is how you make holes without complicated tools.

The material test: where the numbers come from

The question ‘what power and what speed do I use on THIS material?’ does not have an answer that can be written in a manual. It depends on your machine, your diode, the wood you bought and even the humidity. That is why there is a button that answers it for you: “Material test”.

It generates a card where each cell is engraved with different settings. You engrave it, look at it, pick the cell that came out best and use those numbers in your design.

1. Choose whether you are going to test ENGRAVING (with fill) or CUTTING.
2. Choose TWO things that change —speed, power, line interval, passes or air—: one across the columns and another down the rows, each with its range.
3. Say what size you want the whole card to be.
4. Tap “Create the test”. The card comes out already labeled, and from there it is sent to the machine like any other design.

Before creating it, look at the “Replace the whole canvas” checkbox. It comes TURNED ON, which means the card replaces everything on the canvas. Turn it off if you would rather the card be ADDED to what you already have: then nothing gets deleted, your layers stay where they were and your project keeps its name. In both cases, a Ctrl+Z brings everything back.

In step 2, each axis takes one row. It starts by saying whether it is “Columns” or “Rows”, then what is going to change, and then come the three numbers: from how much, “to” how much and “in” how many steps. On the right, in gray, is the allowed range; for speed that limit is set by YOUR machine when it is connected, and it says so with “(from your machine)”.

Two of the five do not take the three numbers. If you choose “Air” as an axis there is no range to type: there are two states, so it tests with air and without air. And if you choose “Passes”, the steps are not typed: they come out of the range by themselves, because a pass and a half does not exist.

Tip · “Geometric steps” concentrates the samples at the low end of the range, which is where the material really changes. From 100 to 3 000 it gives 100 · 234 · 548 · 1 282 · 3 000 instead of spreading them out evenly.

Below the axes there is a block titled “Constant parameters during the test”. There you find the parameters you did NOT choose as an axis, and they are used THE SAME in every cell: if in an engraving you test speed against power, that is where you decide the line interval, the passes and the air. It is the fixed baseline you compare against, and that is why the card repeats it afterwards: the numbers in the header and the air in the bottom corner.

⚠ **Check that block before creating the card. A value out of range gets trimmed by itself, and then the test is not engraved with what you asked for without anything telling you. That is why every field you type into has the allowed range next to it, in gray.**

⚠ **With that checkbox on, which is how it comes, the card REPLACES whatever you have on the canvas WITHOUT asking: no confirmation window appears. Ctrl+Z brings it back whole, so nothing is lost — but save your design first if it gives you peace of mind.**

The window stays open after the card is created, and the notice “Done: the test is in the editor.” appears. That is on purpose: it almost never comes out right the first time, and this way you change a range and generate again without having to open it again. Close it with the X when you are done.

The card comes out labeled with everything you need to read it months later: the header lists the settings used for everything that does not vary, the two axes are named with their values, and in the bottom-left corner the word “Engrave” or “Cut” appears together with whether the air was on. That corner is the gap where the two axes cross and it takes no space from anything.

ON THE CANVAS, the card is shown in grays on a white sheet of its exact size: each cell in the gray of the ENERGY it is going to deposit. The one that burns most —more power, more passes, less speed, less spacing between lines— looks almost black, and the one that burns least, almost white. That way you see at a glance which corner the card leans toward before you spend any wood. And all its labels stay at least 3 mm from the edge, so that cutting it out along its frame does not take any of them away.

Tip • Do not be surprised if many cells look similarly light: that is faithful to what is going to happen. Energy is not spread evenly, and finding which corner of the range holds the useful band is exactly what the card is for.

Tip • The Material test window is dragged by its title bar, just like the Personalizer's, in case it covers what you want to look at.

At the bottom of the window, next to “Cancel” and “Create the test”, there are five numbered “Memories”, like the station buttons on a radio.

- An empty memory looks like a dimmed outline. Tap it: it asks you for a name and, when you confirm with “Save”, what you have set right now goes inside it. The name is shown under the button.
- A full memory is shown in color: one tap LOADS the whole of it — the mode, the two axes with their ranges, the geometric steps, everything else and the size.
- To overwrite a full memory, press and hold it for a moment. That is also where “Clear” appears, in case you would rather free it up.

Tip • Even if you save nothing, the window opens again with the last thing you created, so changing a range and testing again does not mean redoing everything. The memories live in this browser, like the projects: they do not travel to another computer.

The labels are engraved with a simple single-stroke lettering, not with the outline of a typeface. It reads just as well and takes a fraction of the time: labeling a card goes from a minute and a half to a few seconds, and that time is yours.

Text and images

Text

With the "Text" tool, tap the canvas and type. To edit a text that already exists, double-click on it, or simply start typing with the text selected.

Six typefaces come included: Inter, Inter Fina, Lora, Pacifico, Bungee and JetBrains Mono. If you want another one, the Properties panel has two ways. "From computer..." lets you choose among the fonts installed on your computer, and it only appears there: on a phone that button does not show up. "File..." accepts a .ttf, .otf or .woff file, and it is the way that does work on a phone.

⚠ A .woff2 file cannot be used yet: when you choose it you will see the notice "That file is .woff2 and we cannot read it yet." Get the same font as .ttf, .otf or .woff.

Tip • The font you choose is copied into your project. If you give the .rpl to someone else, the text looks the same for them even if they do not have that typeface installed.

Images and photos

Images come in through the formats bar, with the "JPG ↓" button — it accepts PNG, JPG and WebP. Once placed, it moves, rotates and scales like any other shape.

In Properties you choose the "Dithering", that is, how the photo is turned into burned dots. There are four; if you do not know which one, try Atkinson, which usually works best on wood with a diode laser.

- Transparent areas are NOT engraved. They stay as the material.
- With "Crop" you choose which part gets engraved. It can be undone: "Remove crop" gives you back the whole photo, with no loss.

In "Image adjustments" you correct the photo without leaving the program: "Negative", "Auto balance", "Brightness", "Contrast" and "Gamma". What you adjust is shown on the canvas, gets engraved, gets exported, and it is the photo that "Outline for cutting" and "Vectorize image" use. "Reset" puts it back as it came, and each slider is undone in a single step. As soon as you change something two buttons appear: "Done" accepts the adjustments and clears the selection, and "Cancel" returns the photo to the tone it had before you started adjusting it.

- "Auto balance" only looks at the part that is visible: if you cropped the photo, it stretches the grays of what you kept, not those of the whole file.

Tip • Tick "Engrave preview" to see on the canvas the dots the laser is going to burn, with the "Dithering", the layer's "Line interval" and your adjustments. The gray of each dot is the layer's "Power": at 100 % it looks black and at 40 % light gray, just as a layer at that power is painted. It is only a view: it does not change what gets engraved. The checkbox is remembered in that browser,

so the next time you open the editor it is still as you left it. With a very large image and a very fine line interval it is shown with its adjustments but without dithering, and the panel tells you so.

⚠ A photo with detail generates hundreds of thousands of lines and can take hours. The setting that matters is the layer's "Line interval": raising it from 0.1 to 0.2 mm cuts the time in half.

Outline: the edge to cut the piece along

If you are going to CUT OUT what you engraved —a keychain, a tag, an ornament— you need a line around the outside of the drawing for the cut to follow. Drawing it by hand, segment by segment, is what everyone did until now, and it has two problems: it takes effort, and when you want to change the spacing you have to redo it entirely.

“Outline for cutting” makes it by itself, and leaves it LINKED to your drawing: the spacing can be adjusted whenever you want and the edge redoes itself.

How to use it

1. Select what you want to wrap. It can be a shape, several, a text, a photo, or all of them together.
2. Tap “Outline for cutting”. The edge appears and, next to the piece, a small window titled “Outline spacing”.
3. Move the slider and watch the edge change on the canvas. You can also type the exact number in the field on the left.
4. When you like it, tap “Done” or simply click outside. The outline stays fixed. If you were not convinced, tap “Cancel”: the outline goes away and your drawing is left as it was.

Tip • The small window places itself to one side of your piece and does NOT cover it. If it does not fit on the right, it moves to the left by itself; and if the piece is so wide that there is no room on either side, it goes underneath.

Out of the box, the outline is created on ITS OWN layer, a cutting one, and not on the active layer: you no longer have to remember to prepare a cutting layer before creating it. Two checkboxes in the small window govern it, and they are explained in the next section; if you turn them off, the outline falls on the active layer again.

It is GROUPED with what it wraps, so moving or rotating it takes everything along together, without getting out of place.

⚠ The spacing is the distance to the DRAWING, not an adjustment for the width of the cut. The beam removes a few tenths of a millimeter (the kerf) on each side; if you need the piece to come out at an exact size, do a test first.

The outline layer

Below the slider, the small window has two checkboxes. Both are born turned on, and they stay as you leave them the next time you open the program too: there is nothing to confirm.

- “Put the outline on its own layer”: the outline goes to a new layer, with its own power and its own speed. If you turn it off, it falls on the active layer and inherits its settings, which is how it used to work.
- “Cut”: that new layer is a cutting one. If you turn it off, it is an engraving one. It only means something with the first one turned on, so it is not shown while the first one is off.

⚠ The cutting layer is placed AT THE END of the list, after all the engraving. Even if you moved it, it would still be cut at the end, because cuts always go after the engraving: there it only makes the list read in the order things get engraved. The engraving one, on the other hand, is placed right next to your drawing's layer.

The power and the speed of the new layer are copied from the layer of that same mode you were already working with in this design, as long as you typed its numbers yourself since you opened the program: a layer that arrives ready-made —wherever you open it from, or created for you by a tool— does not count until you type its power and its speed into it; if you then undo that change it stops counting again, and numbers you typed for cutting do not count either if you later switch that layer to engraving. If there is none, they are copied from the last one you touched in this browser, even if it was in another project.

⚠ And if there is none of those either, some factory values are used, and they are a GUESS because nobody has tried them on your machine or on your material; that is why the small window always reminds you, in amber, to set the power and speed of the new layer for your material. Check them before engraving or cutting and, if you do not know your material, run a “Material test” first.

The layer is called “Outline”, with a number after it: 1 for the first one, 2 for the next. Every outline you make gets a brand new one, so you can give each of them its own power; adjusting the spacing of an outline you already made reuses its layer and does not create another.

Tip • A single Ctrl+Z undoes the outline and its layer at the same time. And if you turn the checkbox off, the outline goes back to your drawing's layer and the layer that was left empty goes with it, so that loose layers do not pile up on you.

The two checkboxes only show up with a FRESHLY made outline. If you select an outline you already accepted and tap “Outline for cutting” again to change its spacing, they do not appear: its layer is by now a layer like any other, which you may have moved or renamed, and it is governed from the “Layers” panel. They do not appear either if you move the outline to another layer with the “Properties” dropdown: from that moment on you are in charge, and the checkboxes are not going to touch a layer of yours.

Wrapping a single thing or wrapping everything

With several pieces selected you get ONE single outline that takes all of them in, not one per piece. And if they are so close that their edges touch, they merge into a single silhouette: that is correct, because cutting there would be cutting the same line twice.

Raise the spacing and you will see several loose pieces join into a single shape; lower it and they separate again. It is the fastest way to decide whether you want separate cutouts or a single plate.

INNER holes do not get an outline: the hole of an O or the middle of a donut do not get a cutting edge, because the outline is where the piece separates from the material, and that hole does not separate.

With photos and images

When you outline an image, the small window offers two more buttons:

- “Rectangle” wraps the photo along its edge, as it is. It is what you want for cutting a rectangular plate with the photo inside.
- “Silhouette” follows the SHAPE of what is inside the photo. It is what you want for cutting out the figure and throwing away the background.

If the image is a PNG with transparency, the silhouette comes from the file itself and is exact. If it is a JPG—which has no transparency—RapiLaser has to DEDUCE where the drawing ends, and for that a second slider appears, “How much is drawing”: move it until the edge hugs what you want and leaves out what you do not.

Tip • That slider spreads its whole travel over the tones YOUR photo really uses, so both ends always do something and the change is even from one end to the other.

If you gave the photo a CROP, the outline respects what is visible: it wraps the cropped part, not the whole file.

⚠ With a photo that has a busy background or little contrast, the silhouette is not going to come out well however much you move the slider. In that case it is better to crop the photo first, or to use “Rectangle”.

With text

Text can be outlined too, both the text you type in the application and the text that comes in an SVG. The letters are converted to their real shape—the same one they will be engraved with, and with the same spacing between letters you see on the canvas—and the edge wraps them.

Tip • With low spacing, each letter gets its own edge; raising it, the letters join until they end up as a single tag around the word. Try 2 and 8 millimeters and you will see both things.

If you used a font of your own and for some reason it cannot be read, that text is left out of the outline and we tell you: everything else gets outlined, instead of doing nothing.

Changing your mind

While the small window is open, Escape cancels the whole outline and leaves your drawing as it was, just like the “Cancel” button. If you regret having canceled, Ctrl+Y brings it back. “Cancel” is disabled if in the meantime you changed something outside the small window—you moved the piece, you undid something—, because restoring your drawing would take that change away too. The same goes for the Vectorize window. In “Image adjustments”, on the other hand, Escape only clears the selection: the only thing that reverts the adjustments is its “Cancel” button. If you already accepted it and later want a different spacing, select it and tap “Outline for cutting” again.

If you delete the shape it wrapped, the outline does NOT disappear: it stays as a loose path, in case you wanted it that way.

Vectorize: turning a photo into paths

A photo is engraved dot by dot, like a printer. Vectorizing is something else: it turns the photo into PATHS —lines the laser follows— and with them you can engrave by gray levels, cut the silhouette, or both. It is what you need to turn a logo into a cut-out piece.

How to use it

1. Select the image and tap "Vectorize image". A small window opens next to the piece.
2. Choose what for: "Engrave", "Cut" or "Both". You can change your mind as many times as you want; the drawing is redone each time.
3. Adjust "Gray tones" and the slider that goes from "More detail" to "Cleaner" until you like what you see on the canvas. While it works you will see a spinning ring and a percentage: with 7 tones and a large photo it takes a couple of seconds, and that way you know it did not get stuck.
4. Tap "Done". The paths become normal shapes, which you can move, scale and edit. If you were not convinced, tap "Cancel": the paths and their layers go away, and your image is back as it was.

Each gray level lands on ITS OWN LAYER, and each layer is created with the power that corresponds to it: light tones at low power, dark ones at higher power. That is why when it finishes you will see several new layers, not one. The layer the image was on goes away with it if it is left empty and nobody gave it a name or numbers.

WHITE IS NOT ENGRAVED. The lightest tone of your drawing is the untouched material — the raw wood, the paper—, so it does not create a layer and the laser does not even pass there. That is why the numbers are 1, 3 and 7 and not 2, 4 and 8: it is how many grays LEAVE A MARK, with white set apart.

On the canvas, each layer is painted in the gray of its TONE: the average gray of the part of the photo it traces. That way what you see looks like the photo, and the power it will burn with comes from that same tone: the darkest tone, with the highest.

Tip • If the dark grays get lost on the black canvas, change the canvas color to one of the woods or to pearl white (see "The canvas color"). The grays of the vectorized image stay as they are: only what is behind them changes.

Tip • While you drag a slider you see the result on the fly, with the same grays, the same size and the same cutting color it is going to end up with. When you let go, what you are seeing goes EXACTLY AS IT IS into your design, even if you release the mouse outside the slider.

The four everyday controls

- “Engrave”, “Cut” or “Both” decides what comes out: patches of gray to burn, the outside line to cut out, or both.
- “Gray tones” is how many grays are going to leave a mark. With 1 you get black and white — a single layer, the black one—; with 7 it already looks like a screen-printed photo. Each jump doubles the detail, and also the time it takes. There are no more than 7: with more grays it became very slow, and a photo that really needs them engraves better with its dithering.
- The “More detail” – “Cleaner” slider is the one you will use most: toward “More detail” it keeps down to the last speck, toward “Cleaner” it keeps the big shapes and throws away the noise. Curved edges come out round, not in straight segments, and corners stay sharp.
- “Light power” and “Dark power” are the two extremes the layers are spread between.
- Below, “Power of each layer” shows how hard each one is going to burn —“Layer 2 · 21 %”—, from the lightest to the darkest and with its gray. It changes live while you move any slider, and it is exactly the power that is going to be engraved. Each layer carries the same number as in the Layers panel.

⚠ With a lot of paths the canvas gets slow to move or zoom. From five thousand on we warn you; with “Cleaner” or fewer tones you get far fewer.

Tip • A one-ink logo —black on white— gets engraved whole even if you ask for a single tone: there are no two grays to share out there, and the drawing is simply the drawing.

The “Image” section: retouching the gray before tracing

It comes folded, and most of the time you do not need to open it. It is useful when the photo does not have good contrast and the result comes out poor because of that, not because of the tracing.

Tip • If the photo already has “Image adjustments” in Properties, Vectorize starts from the ADJUSTED photo and these controls are applied on top. That is why a “Negative” set in both places cancels out.

- “Negative” inverts lights and darks. It is what you need when the drawing is lighter than its background —chalk on a blackboard, a white logo—: without it, it gets engraved at the minimum and can hardly be seen.
- “Auto-balance of the Original Image” stretches the PHOTO's tones so that its darkest gray reaches black and its lightest reaches white. The boundaries between layers stay where they were, so, just like “Brightness” or “Contrast”, what changes is WHICH areas land on each layer: the darks move to the dark layers and the lights to the light ones. For washed-out or poorly lit photos.
- “Brightness” lightens or darkens everything equally: raise it and less area gets engraved, lower it and more does.

- “Contrast” spreads the grays apart or pulls them together around middle gray: raise it and the darkest layer grows at the expense of the middle ones; lower it and the image flattens and fewer layers come out.
- “Gamma” moves only the MIDDLE tones, without touching white or black: below 1 less area gets engraved, above it, more.

“Brightness”, “Contrast” and “Gamma” mainly change WHICH AREAS land on each layer, and much less how much power each one burns with: in a photo, the middle layers hardly change their %. To burn harder or softer, use “Light power” and “Dark power”, and check the result in “Power of each layer”.

Tip • In a photo, “Brightness”, “Contrast” and “Gamma” change the tones INSIDE the silhouette, not the silhouette: what is drawing and what is background is decided with the photo as it came, so moving them does not make the whole image jump to being drawing halfway along the slider.

- “Threshold” shifts all the boundaries between layers at once. Raise it and more grays count as dark: more area gets engraved, but the % of the layers usually GOES DOWN, because each one picks up lighter grays. Lower it and the opposite happens. If you lower it so much that nothing is left to engrave, we warn you; each slider always moves the drawing in the same direction.

Tip • If you get lost, reset everything to its default: with all six at their defaults the result is exactly the same as if the section did not exist.

Cutting: so the piece does not fall apart

When cutting, six more options appear, and they are the ones that decide whether you get one piece or a pile of little bits.

- “Join pieces” —on by default— looks for where the pieces are closest to each other and joins them with minimal bridges. The holes in letters, like the one in the A, get cut just the same.
- “Flexible material” —it sits under “Join pieces” and is off by default— is for tissue paper and other materials that bend. Every piece left hanging from a single bridge gets another one, or two if it is large, away from the one it already has. Large pieces, like the hat in a papel picado, get bridges until no stretch of their edge is left loose. All of them use the thickness of “Bridge width”.

Tip • “Flexible material” is a help, not a strength calculation: check where the bridges ended up before cutting, because one may cross the drawing.

- “Bridge width” is the thickness of those bridges, as a percentage of the height of the piece they hold. Raise it if the piece breaks there when you pop it out.

- “Base bar” puts a straight bar under everything and hangs from it whatever has nothing to hold on to. It is what turns a loose name into a one-piece keychain.
- “Outline only” cuts only the outer edge: it does not open the inner holes.
- “Outline Spacing” moves the cut line outward from the drawing, in millimeters: at 0 it cuts flush, and more leaves a border of material around it. Holes shrink by the same amount, so for a papel picado it is best left at 0.

⚠ The layer's cutting parameters —power, speed and passes— are set by you, as in any cut. Vectorize draws where, not how hard.

When NOT to use it

For a real photograph —a face, a landscape— vectorizing is not the way: use the image as it is with its dithering, which is what knows how to do gradients. Vectorize shines with logos, silhouettes, lettering and drawings with few tones.

The Personalizer: one design, many pieces

Forty keychains with forty different names, without copying the design forty times by hand. It works just as well for plaques, cards, earrings and ornaments.

How to use it

1. Draw ONE piece. Where the name goes, do not write anything yet.
2. Select all of it —Ctrl+A takes everything on visible layers— and tap the Personalizer button.
3. Tap the title of the "{label1}" column. The placeholder appears BELOW your design, one centimeter away and in the typeface you are using, and it is left selected on its own. Drag it to where you want the name to appear.
4. Paste the list of names into that column, one per row.
5. Tap "Create N pieces".

Just like in the material test, the "Replace the whole canvas" checkbox comes TURNED ON and leaves the canvas with only the batch. Turn it off so the copies are added to what is already there. Ctrl+Z undoes either one.

You can use up to three placeholders —{label1}, {label2} and {label3}— with one column each: name, position and date, for example. Each one appears one centimeter below the previous one, at the same size, so they never overlap and you can grab them one at a time.

They appear outside the drawing on purpose: on top of it, the click to move them ends up selecting the shape underneath. And they start out somewhat smaller than the width of the piece, which is more comfortable for placing them.

⚠ A label you leave undragged gets engraved WHERE IT IS, that is, below each piece. It is a starting position, not the final spot.

The data

Write one per row, or paste a whole column from Excel or a CSV. Accents and the letter ñ fix themselves: a CSV exported from Excel in Spanish arrives in the old Windows encoding, and without that fix diamonds would come out in José, Muñoz or Concepción.

Each name stays WHERE you put the placeholder. What "Alignment of the name over the mark" decides is which edge of that mark stays still when the name is longer or shorter than it: "Starts where the mark starts", "Centered over the mark" or "Ends where the mark ends". That way 'Ana' and 'José Manuel' line up with each other on the point you chose.

The SIZE of the name comes from the body of the mark you placed, so if you want them bigger, enlarge the mark and they all follow it. A name that does not fit across gets smaller; one that would stick out of the piece slides inward instead of shrinking, so it does not end up microscopic.

The three are placed in order —first the drawing, then {label1}, then 2 and then 3— and each one avoids what is already placed. That is why the second one gives way to the first and not the other way around: if they were placed at the same time, two long names would both shrink and neither would be readable.

⚠ If the placeholder is so close to an edge that shrinking does not fix it, the name keeps its size instead of disappearing. Move it yourself in that case: a microscopic name is worse than one that grazes the edge.

The layout

- “Material width (mm)” and “Material height (mm)” are the piece of stock you are going to use, not the whole work area. The button next to them sets them to the full work area.
- “Spacing (mm)” is the gap between pieces; “Margin (mm)” is what is left free at the edge of the material.
- “Minimum clearance (mm)” is the distance required of each name from the drawing, from the other names and from the fixed texts and images the piece has. If a name ends up closer, it shrinks by itself until it respects it. It is measured against the OUTLINE of what is there, not against its bounding box: on a hollow keychain, a name can go through the hole without it counting as a collision.

At the bottom it tells you how many pieces fit and how many are left out. The piece is NOT rotated even if rotating it would fit more: forty crooked pieces are not worth the material you save.

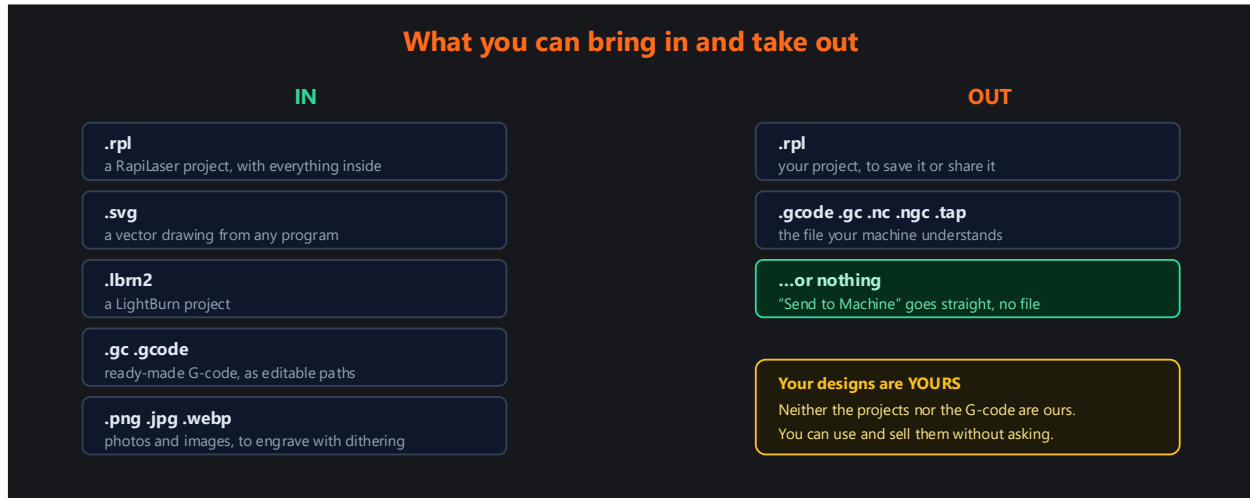
The window does not get in your way

You can keep working in the editor with the Personalizer open, and drag it by its bar to wherever it does not bother you. At the bottom it has three buttons:

- “Create N pieces” generates the batch and LEAVES the window open, so you can look at it, correct a margin and generate again.
- “Close” closes the window and leaves everything as it is.
- “Cancel” undoes the batch you just created and closes. It is disabled if you already did something else afterwards: in that case, undoing would take that away instead of the batch.

Tip • Give a batch a name and it is saved as a recipe, with its measurements and its layout. Next time you choose it and only change the list.

Files: saving, importing and exporting



Where your projects live

Wherever you choose. The "File" menu has "New", "Open...", "Save" and "Save as...", and a dot next to the name tells you there are unsaved changes.

"Save as..." asks for the DESTINATION, and there are three:

- "In this browser's memory" is the usual one and comes selected: the project appears in "Open...", stays on THIS computer and in THIS browser, and does not travel to another computer.
- "On this computer, as a .rpl file" lets you choose the folder and saves a real file, which you can back up, copy to a USB stick or send by email. If your browser does not know how to ask for a folder, it falls back to a normal download.
- "In the cloud" is grayed out, with "Coming soon". There are no accounts yet.

There is also an automatic draft: if you close the tab without saving, when you come back you will see "Work recovered".

⚠ **"Delete" in the project list is IMMEDIATE and irreversible, and it does not ask for confirmation. Ctrl+Z does not bring it back: undo is for the drawing, not for the storage.**

⚠ **If you use incognito mode, or if you clear your browsing data, your projects go with them. When we detect that storage is not durable we warn you with an amber band. Export to .rpl anything you do not want to lose.**

Taking a project with you

"RPL 1", in the formats bar, creates a file with EVERYTHING inside: the drawing, the images and your own fonts. It is the format for backing up, for taking it to another computer or for passing it to

someone. "RPL ↓" brings it back, and if you have unsaved changes it asks you before overwriting them.

Tip • The "File" menu is your PROJECT —New, Open, Save, Save as— and the formats bar is the FILES, what you carry from one computer to another. The two used to be mixed together in the menu.

⚠ There is no cloud, no account and no syncing. A project saved on the laptop does not appear on the phone: the bridge is exporting and importing.

The formats bar

The row with pairs of arrows is ABOVE the drawing tools, next to the "File" menu and the "Download G-code" and "Send to Machine" buttons. The down arrow IMPORTS and the up arrow EXPORTS. There are six rows: SVG, DXF, LBRN2, JPG, GC and RPL.

- "SVG ↓" brings in a vector drawing from any program. It ADDS to what you already have, and it also brings its TEXTS as real text —editable, not as loose paths—. What is imported arrives grouped, and if the file uses several colors each one lands on its own layer, so you can give each color its power and its speed. If your design already has a visible layer of that color, or of a very similar one, the path lands on it with all its settings; a hidden layer receives nothing and stays as it is. If not, the new layer is a CUT layer when the file brings lines without a fill and an ENGRAVE layer when it brings fills or texts; if a group in the file is named CUT or CORTE, or ENGRAVE or GRABADO, that decides. Its numbers come from the last layer of that mode you worked with and, if there is none, the factory values are set and we warn you in amber. If the layer you were on is left empty and untouched —no name or numbers of yours—, it is removed, so you are not left with an extra layer at the top of the list.
- The size comes from the file's measurements: an SVG in mm, cm, inches or points comes in exact. If the file is in pixels or has no unit, the size depends on how many pixels per inch (DPI) the program that made it used: Adobe Illustrator uses 72, Inkscape 96 and its old versions 90. RapiLaser detects it when it can, otherwise it assumes 96, and before placing it shows you the detected size with a selector to change the DPI; the same window appears if the drawing does not fit in the work area or measures less than 1 mm. If your design comes out at another size, try 72.
- "DXF ↓" opens a drawing from a CAD program —AutoCAD, LibreCAD, Fusion, QCAD—: lines, polylines, arcs, circles, ellipses, splines, blocks and texts, in millimeters. Like the SVG, it ADDS to what you already have and spreads the colors over layers. What cannot be engraved —hatches, dimensions, images— is left out, and we tell you what stayed out. If the file does not say what units it is in, it is read in millimeters and we warn you so you check the size before cutting.
- "LBRN2 ↓" brings in a LightBurn project with its layers. It has no export arrow and it is not going to have one: LightBurn's format is closed and cannot be written.
- "JPG ↓" places an image. It ADDS to what you already have.

- “GC ↓” brings in ready-made G-code as editable paths, grouped into layers by power and speed.
- “RPL ↓” opens one of your projects from a file.

What gets ADDED comes in shifted a little relative to what was already there, so you can tell it came in: without that, two imports in a row would fall exactly on top of each other and it would look as if the second one never arrived.

⚠ “LBRN2 ↓” REPLACES your whole canvas WITHOUT asking. Only “GC ↓” asks first (“Replace your design?”). If it catches you by surprise, Ctrl+Z undoes it: the whole import counts as a single step.

⚠ Everything you import from another tool brings PARAMETERS FROM ANOTHER MACHINE. You will see a notice asking you to review the power and speed of each layer before running. Pay attention to it: a speed from another machine can ruin the piece or start a fire.

⚠ The G-code importer has two known limits. A file with several passes arrives with the geometry duplicated, and a fill comes back turned into loose lines. If the file is a photo engraving, do not open it in the Editor: load it directly in Machine, which does handle it.

For exporting there are five arrows. “GC ↑” gives you the G-code. “SVG ↑” comes out in REAL MILLIMETERS—a 100 mm piece measures 100 mm when you open it in Inkscape or in Illustrator—with one layer for each of your layers, the text as text and the photos inside the file. “DXF ↑” gives it for a CAD program, also in millimeters, with one layer for each of your layers and the texts turned into the outline of their letters. “RPL ↑” saves the complete project. To LightBurn you cannot, and you will not be able to.

- “JPG ↑” downloads an IMAGE of your design just as it is going to be engraved: at real size, at 300 dots per inch, on white and with each layer in its color—the ones from a vectorized image, in the gray of their tone—. It is useful for showing a customer how it is going to look before burning anything. The file comes out in PNG format, which does not blur the edges.

⚠ That image is a PHOTO of the design, not the design: it cannot be opened again in RapiLaser to edit it. That is what “RPL ↑” is for.

⚠ The SVG and the DXF are drawings, not projects: they do not carry the power, the speed or the passes of your layers. To back up your work with everything inside, use “RPL ↑”.

Getting the G-code out

“Download G-code” gives you the file to use wherever you want, with the extension you choose. But to engrave from RapiLaser you do not need it: “Send to Machine” generates it and loads it directly.

While the job runs you will see two times together: “Left”, the time the program calculates is still to go, and “Elapsed”, a stopwatch of the real time since it started. The stopwatch does not guess anything: it counts, and it keeps counting even if the machine gets stuck. Pauses are not added to it.

"Send to Machine" RESPECTS THE SELECTION: with nothing selected it sends the complete design, and with an active selection it sends only that. It is useful for engraving in parts — first the outline, then the fill, or repeating a piece that did not come out right. The button tells you before you touch it: when it is going to send only part, it reads "Send N selected" instead of "Send to Machine".

⚠ "Download G-code" does NOT respect the selection: it always exports the whole design.

Downloads go wherever your browser saves downloads. The only one that lets you choose a folder is "Save as..." → "On this computer", and only if your browser knows how to ask for it.

Everything that gets downloaded carries the name of your project and the DATE: 'plate-2026-09-08.svg'. It is so that your downloads folder stays readable: with three exports of the same design on the same afternoon, 'plate (1)' and 'plate (2)' do not say which is which. This very guide downloads as 'RapiLaser-User-Guide-v4.37.0-2026-10-04.pdf'.

From design to machine

When the design is ready, “Send to Machine” generates the file and takes you to the other screen with the job already loaded. While it works you will see “Generating...”.

Before sending it we check the real path —the one that includes the text turned into paths, the photos and the acceleration margins— against your machine's area. If something goes outside it, “The job goes outside the work area” appears and you decide: “Send anyway” is there for when you do it on purpose.

What you see on the Machine screen

- The preview of the complete path, with “+”, “-” and “Fit”.
- “Lines” and “Job size”.
- “Estimated time”, with the breakdown “Where the time goes”: burning, travel moves, speeding up and slowing down, and waiting on the cable. It includes a bottleneck tip that tells you what to change so it takes less time.

You can also load a file directly here with “Load file”, or by dragging it onto the area.

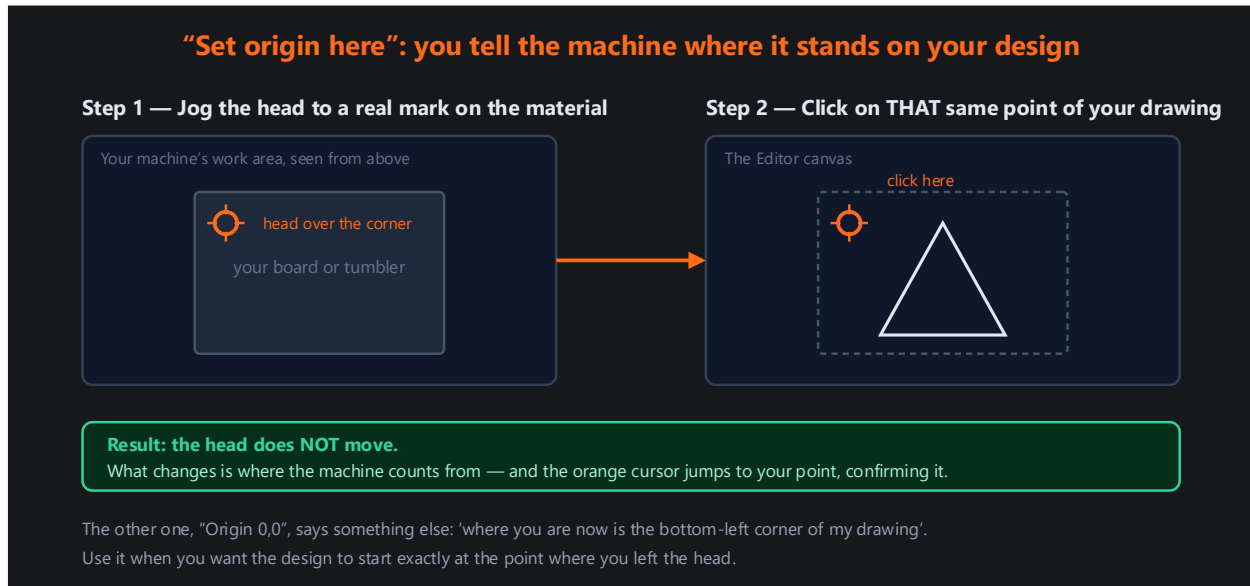
⚠ If you change the design after sending it, we warn you: what would run is what you loaded, not what you see now in the Editor.

The “Laser enabled” checkbox

When unticked, the job runs with the laser off: the machine goes through the whole movement without burning anything. It is the safest way to check that the path is the one you expect before spending material.

Lining up the job with the material

This is the part that trips people up most at the beginning, and the one that wastes the most material when it goes wrong. The idea is simple: the machine does not know where you put your board. You have to tell it.



Jog: moving the head manually

In the “Control” panel you have the arrows and the “Step (mm)” selector with 0.1, 1, 10, 50 and “Continuous”. With “Continuous”, you hold down the arrow and the head moves for as long as you hold it.

⚠ The “🏠” button (“Go to work origin”) MOVES the machine for real, in a straight line and at rapid speed. If there is a clamp, a ruler or the piece in the way, it crashes. It is not a ‘start over’ button.

Jog is X and Y only. The height of the head —the focus— is mechanical and is not adjusted from the application: RapiLaser never sends the head up or down.

What we do is remind you to focus before every job, with your machine's autofocus or by hand. It is explained further on, in “Before starting a job: air and focus”.

The two ways to set the origin

“Origin 0,0” says: ‘where the head is now is the bottom-left corner of my drawing’. It is on both screens.

“Set origin here” says something different and more powerful: ‘the head is now at THIS point of my drawing’. It lives only in the EDITOR, because you need to see the design: when you tap it a crosshair is armed, and you click on the point that corresponds.

⚠ Both are the same command with different coordinates, so THEY OVERWRITE EACH OTHER: setting one erases the effect of the other. And there is no undo — if you make a mistake, the way out is to set it again correctly.

⚠ “Origin 0,0” is applied immediately and without confirmation. If you tap it with the head in the wrong place, the whole job gets engraved shifted.

The workflow that really works

1. Put the material in the machine.
2. With the jog arrows, bring the head to a corner or a visible mark on the material.
3. In the Editor, tap “Set origin here” and click on the point of the drawing you want to land exactly there.
4. The orange cursor jumps to that point and “Origin set.” appears: that is your confirmation.
5. Tap “Frame (laser off)” and watch the head trace the outline over the real material.

Tip • Framing is your last chance to notice that something is crooked, and it costs twenty seconds. Always use it.

⚠ With the crosshair armed, a click OUTSIDE the work area sets nothing: the origin stays as it was. And it does warn you — a red notice appears saying that point is outside the area and that the origin was not set, and the rejected-command tone sounds. The crosshair stays armed: there is no need to tap the button again, just mark again inside the work area (the gridded zone).

When the button is gray

With no machine connected, the origin buttons are not gray: they are not there. They appear when you connect. Once connected, they turn gray while the machine is not idle, or while a job is running. In the EDITOR, if you leave the pointer over the button, the tooltip says why: “Wait until the machine is idle.” or “Not possible while a job is running.” In MACHINE there is no such text: the button just looks gray. If the machine is in ALARM, the Editor's tooltip sends you to the Machine screen; there, in the red alarm box, is the “Unlock (\$X)” button.

Homing and the dotted cursor

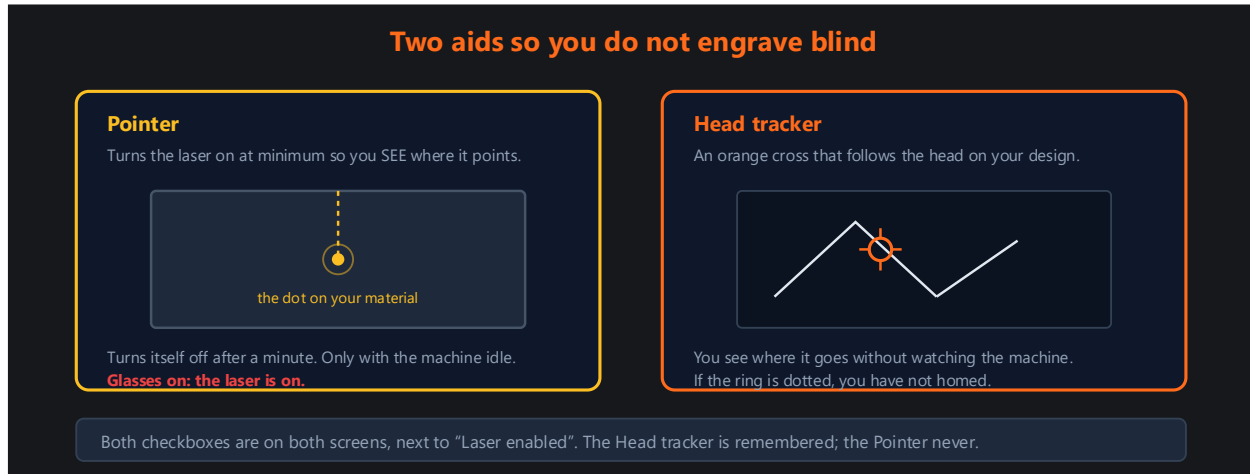
Homing is the maneuver in which the machine goes looking for its limit switches to know exactly where it is. There is NO button for it: you type “\$H” in the console. That is deliberate — homing

moves the head at full speed to the corner, sometimes crossing the whole work area, and we do not want it to fire off from an accidental click.

⚠ Before sending "\$H", clear away anything that could get in the way of the travel.

If you have not homed, the ring of the orange cursor is drawn dotted. It is an honest reminder: the position is still correct relative to the origin YOU set, but the machine coordinates are not real, because the machine has no way of knowing where it is if nobody told it.

Two aids so you do not engrave blind



The Pointer

It turns the laser on at minimum, continuous power, so you can see exactly where it points on your material. It is useful for lining up when the reference is on the object itself.

- It only works with the machine connected and idle. If the checkbox is gray, the text next to it says why.
- It switches itself off after a minute. Tick it again if you need more time.
- If it is on, the frame button reads "Frame (with the Pointer)" and framing does not switch it off: the outline is traced with its beam, at the same minimum power, and it stays on afterwards.
- It also switches off when a job starts, when the machine goes into alarm and when you tap "Disconnect", which is the same plug, crossed out and in grey. While disconnecting, a spinning circle takes the place of the plug: it is turning the beam off, and it only lets go of the machine once the machine confirms the beam is off. If that is not confirmed within 3 seconds, it resets the machine to force the beam off and warns you that the head may move to the corner on its own.
- If the connection is lost with the beam on, the beam does NOT switch off: unplugging does not turn the laser off. You get a notice that does not go away by itself; look at the machine and, if you see the dot, switch it off with its power switch. When you connect again, RapiLaser sends the switch-off again. If you close the tab with the beam on and the machine connected, the browser asks you before closing it: switch the Pointer off first.
- With the machine paused, the switch-off waits until you resume, and next to the checkbox you will see "Turning off... not confirmed". If the dot is still on, use STOP.

⚠ The Pointer TURNS THE LASER ON FOR REAL, and it does NOT depend on the "Laser enabled" checkbox. Glasses on. If the application stops responding with the beam on, switch the machine off with its power switch.

The Head tracker

It draws an orange crosshair that follows the head over your own design, in real time, while it engraves. You can see where it is without going near the machine.

The position lags a fraction of a second behind reality, and that is on purpose: we would rather show you where the head was than guess where it will be.

Before starting a job: air and focus

In the “Control” panel of the Machine screen, below the Pointer, there are two more things: the “Test air” button and the “This machine has autofocus” checkbox. Both are for the same thing: checking something the program cannot find out by itself. Either you tell it, or you have to hear it yourself.

“Test air”

It turns the air pump on for four seconds and turns it off again. While it blows, the button reads “Blowing... 4 s”.

It is for finding out whether your pump is connected to the machine's board and obeys it. There is no other way to know: the machine says yes to the air command even if nothing is plugged into that connector. That is why when it finishes we ask you “Did you hear it blow?” — you are the one who decides.

- If your machine REJECTS the command, we tell you: that firmware does not understand it and you will have to turn the air on by hand.
- If it turned on but could NOT be turned off, we tell you that too. Go and check the pump: it may have been left blowing.
- The button only works with the machine connected, idle and with no job running. If it is gray, the reason appears underneath.

Tip • Do it BEFORE a material test that uses air as one of its two axes. If the pump does not obey, the with-air and without-air columns come out identical and you would end up blaming your wood.

“This machine has autofocus”

Tick it if your machine focuses by itself with its own button. RapiLaser remembers your answer for that machine: you answer once and that is it. If you have two machines and only one of them focuses, each one keeps its own.

Every time you tap “Start” the “Before starting” window appears with the question “Did you focus the machine?” and two options: “It's focused, start” and “Wait, I'll focus it”. It always appears, whether the checkbox is ticked or not, and the same whether you tapped “Start” from the Editor or from the Machine screen.

- The checkbox only changes what it asks of you: ticked, to run the autofocus with your machine's button; unticked, to adjust the height of the laser over the material by hand.

⚠ RapiLaser does NOT focus your machine or send it any command to do so. The checkbox only serves to remind you. There is no standard autofocus command —each manufacturer solves it in its own way and without documenting it— and lowering the head blindly onto your material is not worth the risk. Focus with your machine's button and then confirm.

Tip • If your machine does not focus by itself, leave it unticked: the window will ask you to focus by hand, which is what is useful to you.

Engraving

Start, pause, resume

"Start", "Pause" and "Resume" are in the top bar, and you also have them from the Editor, so you can run the engraving without leaving the design and while watching the cursor move. Pausing stops the movement safely and continues where it left off.

On a phone, those buttons only appear when a job is loaded.

The STOP

⚠ The STOP is always visible and always active, on every screen, even if something goes wrong in the application. It is the only real emergency stop. Remember: if you unplug the cable instead, the machine keeps running what it already has stored.

The top bar stays fixed even when you scroll the page, and nothing is put on top of it: not the notices, not the menus, not the windows. When a window that asks for an answer appears —"Did you focus the machine?", the unsaved-changes one or the one "Save as..." opens— only that window and the STOP respond; the rest of the screen, bar included, waits for you to answer it. With the red connection-lost window, "Connect", the green plug, responds too, because connecting again is one of its steps.

If the connection is lost in the middle of a job

We never resume a job blindly: the machine may have kept moving and we no longer know where it ended up. You will see a red window that cannot be ignored, with the steps to follow: do "Reset (0x18)", check where the head ended up, and tap "Confirm repositioning" before you can run again.

While it works

The browser tab shows the percentage, so you can go to another window. We also keep the screen from turning off while a job is running.

⚠ The RapiLaser tab has to stay VISIBLE for the whole engraving. If you hide it, switch applications or the screen turns off, the browser slows down the sending and the engraving stops halfway through the piece. On a phone this is especially important.

While it engraves, the "Job progress" window appears, in the Editor and in Machine. At the top, in green, it says "ENGRAVING" or "CUTTING". It tells you which layer it is on, with its name, and which pass of that layer's passes, along with the speed, the power, the interval and whether the air is on. Below go the "Estimated" time, the "Elapsed" time, the time "Left" and the percentage.

- You drag it by its top bar and it stays where you leave it, next time too. The × closes it without stopping anything, and while the job runs the “Progress” button, with its percentage, opens it again.
- If the layer has an image or a fill, the power shows as a maximum: it changes point by point, and that is the highest.
- Once everything has been sent it reads “Finishing...”: the machine is still doing what it has stored in its memory, and STOP stops it just the same.

When the job finishes COMPLETELY and without errors, a large green card, “Job Finished”, appears in the Editor and in Machine, and a sound plays. It shows the estimated time next to the actual time it took, and it stays until you close it.

- It does not appear if the job was stopped with STOP, was canceled, went into alarm or the connection was lost.

When it finishes

When it finishes, the head returns by itself to the origin of your job —the point you marked with “Set origin here” or “Origin 0,0”—, with the laser off, so you can engrave the same thing again in exactly the same place. If you did not mark any origin, it returns to 0,0.

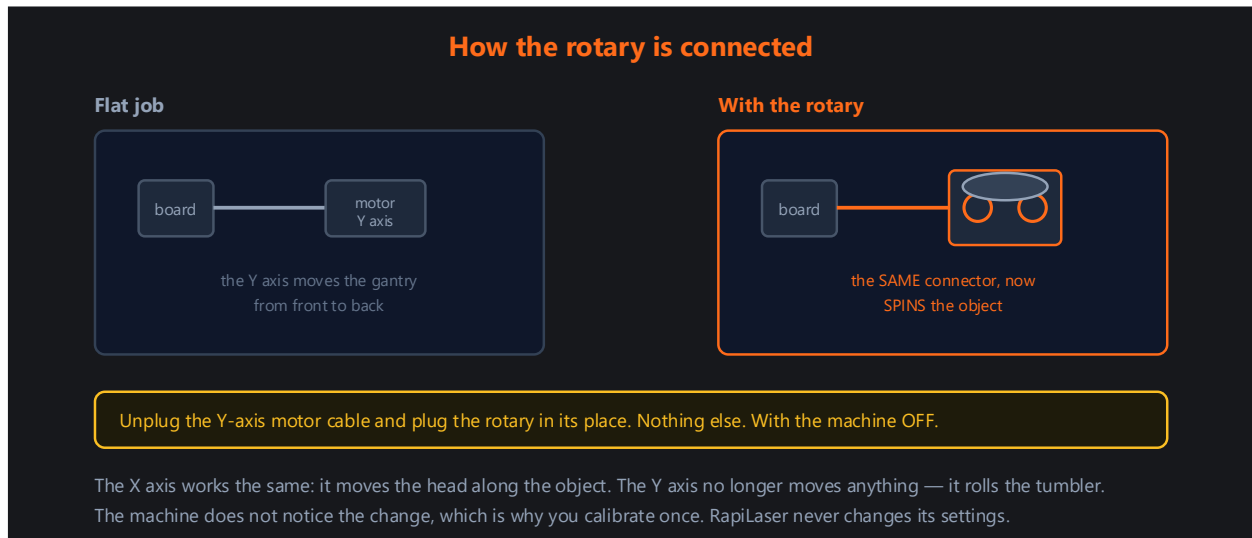
⚠ That return MOVES the machine in a straight line and at rapid speed: do not leave anything in the way between the end of the job and the origin.

- If you tap STOP, “Start” or the arrows before it returns, the return is canceled. After a STOP, an error or an alarm, the head stays where it is.

Once still, the machine releases the motors and the head can be moved by hand. If your machine had them always locked (\$1=255), RapiLaser changes it to \$1=25 by itself when you connect it, and tells you.

Rotary mode: engraving tumblers and cups

A rotary accessory lets you engrave round objects: tumblers, cups, pens, pencils. RapiLaser supports it with friction roller rotaries, which are the most common and the cheapest.



How it is connected

With the machine OFF, unplug the Y-axis motor cable and plug the rotary in there. Nothing else. The X axis still moves the head along the object, and the Y axis no longer moves anything across: now it spins the tumbler.

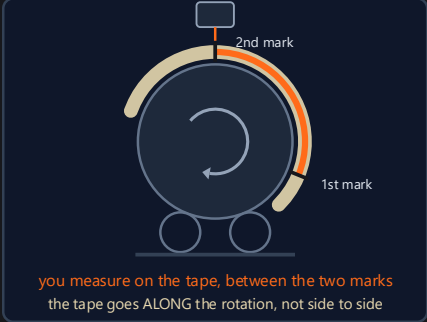
Your machine does not notice the change — it still believes the Y axis moves in straight millimeters. That is why you have to calibrate once.

⚠ This first release is for ROLLERS. There is no chuck mode and no support for tapered objects like cups that narrow.

Calibrating: three ways, and only one asks you to measure

Calibrating the rotary: one measurement, one time

- 1 Stick the tape along the rotation**
A strip of MORE than 150 mm, following the turn of the object. Mark on it the point that sits right under the laser.
- 2 Tap “Turn 150 mm”**
The object turns. The laser stays OFF.
- 3 Mark again and measure**
Mark the new point under the laser and measure on the tape, between the two marks. Type that number.



you measure on the tape, between the two marks
the tape goes ALONG the rotation, not side to side

That measurement settles everything at once: your rollers' diameter, their gears and your machine's settings. We ask for none of them.

On the Machine screen, the “Rotary” panel offers you three ways to calibrate. Choose the one that is easiest for you; all three lead to the same number.

- **PICK YOURS FROM THE LIST.** If your rotary is in the catalog, you select it and you are done. The list starts short and grows with what users measure; each entry says where its number came from.
- **COPY IT FROM LIGHTBURN.** If you already use that rotary in LightBurn, its rotary window has “MM Per Rotation” and “Roller Diameter”. With those two it is calibrated without measuring anything.
- **MEASURE IT.** It is the way that always works, and the one explained below.

⚠ The two LightBurn numbers have to be the ones for THIS machine. The first one depends on the steps per millimeter of the device where you set up LightBurn, so copying them from another computer gives the wrong size.

What gets saved is a constant of the ROTARY, not a number tied to this device. That is why one calibration works on all your machines: each one contributes its own figure when it connects.

To measure it:

1. Connect the machine and go to the Machine screen. The “Rotary” panel will appear.
2. Tap “Calibrate” and choose “Mine is not on the list”.
3. Put the object on the rollers and stick a strip of tape ALONG the rotation —following the turn, not from side to side— more than 150 mm long. Mark on it the point that is right under the laser.
4. Tap “Turn 150 mm”. The object turns with the laser off.

5. Mark on the tape the new point that ended up under the laser, measure on the tape the distance between the two marks and type that number. Tap "Save".

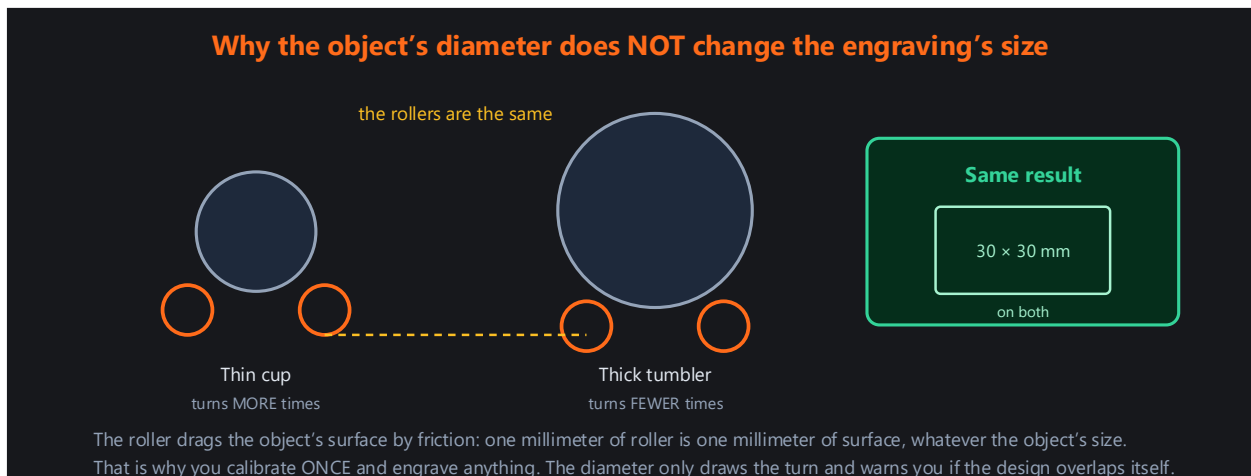
The tape has to go along the rotation and be longer than the travel for a practical reason: that way both marks land on it and the distance is measured with a straight ruler, without fighting the curve of the object.

That is it. That number is saved for THAT machine and it is not asked for again; next to the checkbox you will see "Calibrated:" with the value. If you connect another machine, it will have its own.

Tip • While it turns, watch whether the object slips on the rollers. If it slips, no calculation is going to fix it: adjust the support before going on.

We do not ask you for the diameter of your rollers, or their gears, or any internal setting. That single measurement settles all of them at once.

The object's diameter does not change the size



This confuses a lot of people, even veteran users of other programs, so it is worth understanding: with friction rollers, the object's diameter does NOT affect the size of what you engrave.

The roller drags the surface of the object by contact. One millimeter of roller is one millimeter of surface, whatever the size of the tumbler. A thin cup turns more times and a thick one fewer, but the drawing comes out the same on both. It has been checked with a machine: the same 30 × 30 mm square on three very different diameters, without recalibrating, came out identical.

So what is the "Object diameter Ø:" field for? Only for calculating how long the full turn is—you will see "· the circumference is N mm"—and warning you if your design would overlap itself going around. It is optional.

It is typed in two places, and it is the same figure. One: the "Object diameter Ø:" field of the "Rotary" panel on the Machine screen, which appears as soon as that machine is calibrated; there you can change it or clear it whenever you want. Two: the window that appears by itself the first time you turn the mode on.

That window is titled “How thick is the object?”, has the “Diameter Ø” field and keeps showing you “The circumference is N mm.” as you type. Accept it with “Done” or skip it with “Not now”. It only appears when you TURN ON the mode and only if there is no diameter set yet: once you have set it, it does not bother you again even if you turn it off and on.

That window accepts diameters from 5 to 300 mm. Outside that range, “Done” stays gray.

What we do and what we do not

RapiLaser NEVER changes your machine's settings to correct the rotary's scale. The correction is applied to the file we send.

It is a deliberate decision. Other programs make you change internal settings on the machine, and the problem shows up days later: you go back to a flat job, everything comes out the wrong size and extremely slow, and you do not understand why. Here that cannot happen, because your machine stays untouched.

There is one exception, and we always ask you for it with a confirmation: if your machine has its software limits on, the axis that spins endlessly would exceed them and reject the job halfway through. We offer you “Turn off the limits for the length of the job”, and we turn them back on when it finishes.

Details of the mode

- The mode switch is on both screens, with the machine connected, but it does not look the same: in Machine it is the “Rotary” checkbox, at the start of its panel; in the Editor it is the icon of the round object on its two rollers, with the rotation arrow, in the top bar.
- It cannot be turned on until you have calibrated that machine. In Machine the checkbox stays gray; in the Editor the icon looks dimmed and, if you tap it, a rejection sounds and it tells you where to go.
- While it is active you will see a permanent notice in amber.
- The mode is not saved with the project: if you open an old design, you are never going to inherit a rotary mode you did not ask for.
- With the rotary on, homing is blocked and we explain why.

⚠ REMEMBER TO TURN IT OFF before engraving flat again. The mode lasts for the whole browser session; if you leave it on, your next flat job will come out with the wrong height.

⚠ Never send “\$H” with the rotary on: the Y-axis limit switch can no longer be pressed, so the object would spin non-stop until the machine goes into alarm. That is why we block it.

The canvas draws the unrolled cylinder

With the mode on and the diameter set —you typed it in the window that appears when you turn the mode on, or in the “Rotary” panel of the Machine screen— the canvas stops measuring the work

area: the height becomes the TURN of the cylinder. Two dotted lines appear —the seam— that mark where the rotation closes; they are the same place on the object, so whatever touches one touches the other.

The turn starts where you set the origin, not at the design's zero: if you set the origin halfway along the piece, the seam moves with you.

The diameter is optional and does NOT change the size of the engraving. Without it everything works the same, but the turn is not drawn and we cannot warn you about overlaps.

Tip • In rotary mode the axis that spins has no edges: you can place the design wherever you want heightwise and it will just make more turns. The only thing that ruins a job is the design being TALLER than the turn, because then it gets engraved on top of what was already engraved. We do warn you about that when you send it, and tell you by how many millimeters it is too tall.

When something goes wrong

The machine does not show up when connecting

- Turn the machine on BEFORE connecting, and if it was already connected, try again.
- Try ANOTHER cable. Charge-only ones are the most frequent cause, and they give no error.
- On Windows, the CH340 driver may be missing.
- Close any other program that might have the port busy. Only one at a time can talk to the machine.

Tip • If you are on the public Diagnostic page and you see no error message, it is not that there is none: that page does not show the console. Go into the application, go to the MACHINE screen and look at its console, which is the one that shows what the machine answers.

It says the machine engine could not be loaded

The engine is the piece of the program that talks to the machine, and the browser downloads it separately. If that download fails, “Connect” cannot work: reload the page with Ctrl+F5, which downloads everything again. If it stays the same, let us know — the published version came out incomplete and that is something we fix, not you.

⚠ If the notice appears with a job in progress, do NOT reload the page. The machine can keep moving with what it already has stored, even if the job looks finished. Use the STOP; if it does not respond, TURN THE MACHINE OFF.

It says “There is a new version of RapiLaser”

When we publish a new version, the application notices it by itself —when you open it, every 15 minutes and when you come back to its tab— and tells you with a notice at the bottom that does not stop you from working, showing the version you are using and the one that is already published. “Update now” reloads the page with the new version; “Not now” closes it, and it does not appear again until we publish another one.

- It NEVER appears while the machine might be moving: it waits until it is still. Reloading in the middle of a task would cut the connection to the machine. After engraving, framing or moving the head, it appears once the machine has been reporting that it is still for 2 seconds; if you disconnected before that, it appears when you connect it again and it confirms. With a design sent to Machine without connecting, it appears as usual. It also appears on the Diagnostics page.
- If you have unsaved changes, before reloading it asks you: “You have unsaved changes”. RapiLaser saves a draft in that browser and restores it when you come back; to play it safe, tap “Cancel” and save your project first.

- If a tool —Vectorize, the dithering of a photo or generating the file for the machine— does not manage to load and there is a new version published, the notice appears again even if you had closed it: it is almost always that, and updating fixes it.

Tip • If the button does not work, on a computer hold down Ctrl, Shift and R: the notice reminds you with a drawing of the three keys.

It says “Locked for safety”

It is an alarm on the machine: it will not accept any movement until you unlock it. Use the “Unlock (\$X)” button, or home it with “\$H” if you also want to get the reference back. It usually happens when the head bumped into something or when the machine was switched on in an odd state.

The engraving comes out the wrong size

- If it is flat and the height is wrong, check that you do not have Rotary mode on.
- If it is on the rotary, recalibrate, measuring more carefully and over the curve.
- If you ever edited your machine's internal settings following an accessory's manual, put them back to their original value: we do not need them and they would add up with our correction.

The engraving comes out moved or shifted

- Check that nothing is in the way of the travel and that the material has not moved.
- Use “Frame (laser off)” before engraving.
- Check that you did not tap “Origin 0,0” by mistake with the head somewhere else.

The “Send to Machine” button is gray

- Is there anything drawn? Is the layer visible? A hidden layer does not count.
- Is a drawing tool on? With a tool active the canvas places shapes instead of selecting.

Everything is very slow

A photo engraving is limited by the speed of the cable, not by the mechanics. Raise the layer's “Line interval”: from 0.1 to 0.2 mm is half the time. The bottleneck tip on the Machine screen tells you what is worth changing.

I lost my projects

Projects live in the browser on that computer. If you cleared your browsing data or used incognito mode, they are gone. For the future, export to .rpl whatever matters to you.

Your access code

You get into RapiLaser with a code in the form RAPI-XXXX-XXXX. It is yours, and it works on ALL your devices: the laptop where you design and the phone you engrave from.

- Only the Editor and the Machine screen ask for it. The Diagnostic is public on purpose: anyone can check whether their phone and their browser talk to their machine, without asking anybody for anything.
- Once you are in, the pass renews itself as long as you keep using the application. It is not going to throw you out in the middle of a job.
- If your license expires, the application tells you in exactly those words —“Your license expired”— and not with an ‘invalid code’. Your projects are still saved in that browser, waiting for you.

⚠ The code is personal. Sharing it does not go unnoticed: the server notices when the same code comes in from devices that do not look alike.

How to get one

There is a FREE trial license for 30 days, with no card and no commitment. You request it by filling in a short form on rapilaser.com, or at app.rapilaser.com/solicitud.

The form asks about your machine, what device you are going to control it with and what you want to use it for. It is not red tape: with that we know whether RapiLaser is really going to work for you before you waste an afternoon testing, and we can help you with your particular case.

The code reaches you by email, at the address you put in the form, with the date it is valid until and the link to this guide.

Tip • Before filling it in, open the Diagnostic. It is free, it does not ask for a code and in ten seconds it tells you whether your browser and your device can talk to your machine — which is the question that really matters.

Buying and renewing

At app.rapilaser.com/comprar you will find the two plans, monthly and yearly, with their prices and with VAT already included: what you see is what gets charged. The yearly plan is considerably cheaper than twelve separate months, and right there it tells you how much you save.

Payment is made on Mercado Pago's screen, not here: your card never goes through RapiLaser at any moment. When you finish you receive your code and you can get in right away.

If you already have a license, buying RENEWS it. On the buying page, “Code to renew” is a list with your code if you got into RapiLaser with it from that browser, even if it has already expired: that is the one that receives the time, and with “None: I want a new code” you get a new one. The code is

not typed in, so you cannot pay for time on another person's code. If the list does not show up, the purchase gives you a new code; to renew yours from another device, first enter with it there while it is still valid or in its 3 days of grace, and come back to the buying page. If it has already expired and you don't have it on that device, buy a new one: you don't lose any days or projects. When you come back from the payment, the screen tells you which code you renewed.

The time you buy is ADDED to what you had left and it is counted in calendar months, from the day your license expires: if it expires on October 11 and you buy one month, it now expires on November 11. If that day does not exist in the month, it expires on the last day of the month. Renewing early does not cost you the days you had already paid for, and the trial license is renewed the same way too. If your license has already expired, the time is counted from the day you pay.

And if you would rather deal with a person, write to us at rapilaser@rapilaser.com or on WhatsApp.

Hearing about what is new

RapiLaser has a WhatsApp channel where the news is posted. It is broadcast-only: only we post, nobody sees anybody's phone number, and you can leave whenever you want. The link is on rapilaser.com.

Support

Write to us and we will do our best to answer you.

Email: rapilaser@rapilaser.com

From the application, "Problem or suggestion?" (in the top bar, between the Guide's "PDF" and "Sign out", and also on the Diagnostic page) lets you report a problem or request an improvement without leaving the application, in Spanish or in English, and confirms by email that we received it. Without a license, or from the Diagnostic, it opens that email for you already addressed and with the questions that help us understand you: "Report a problem" asks what you were doing, what you expected and what happened; "Request an improvement", what you want to achieve.

WhatsApp channel with the news: the link is on rapilaser.com

Website: rapilaser.com

How to ask for help so it goes quickly

If something fails, these details save a lot of back and forth:

- Which version of RapiLaser you are using. It appears in the top bar, next to the logo: it is the small number that starts with a v.
- Make and model of your machine.
- Which device and browser (for example: Windows with Chrome, or an Android phone over an OTG cable).
- What you expected to happen and what happened.
- If something came out the wrong size, the measurement you expected and the one that came out.

Tip • The Diagnostic page is public and does not need a code: if you have compatibility doubts, open it and tell us what it says, especially the "Chosen medium" row.

Legal notices

Copyright

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The other trademarks mentioned in this guide —among others LightBurn, Atomstack, Sculpfun, Ortur, Creality, LaserPecker, xTool, Chrome, Edge, Android and Windows— belong to their respective owners and are cited only to identify compatibility. Mentioning them does not imply sponsorship, affiliation or endorsement by any of the parties.

What is yours

Your designs are yours. RapiLaser claims no rights over the files you create with it: not over your .rpl projects, not over the images you place, and not over the G-code the application generates. You can use them, sell them or modify them without asking us for permission.

The G-code the application produces carries a comment line that identifies the program that generated it. It is a mark of where the file came from, not a claim of rights, and you can delete it.

Limitation of liability

⚠ A diode laser cuts, burns and can cause permanent blindness. Read this section even if you read no other.

RapiLaser is provided 'as is', without warranty of any kind, express or implied, including those of merchantability, fitness for a particular purpose and absence of defects.

Operating the laser machine is the sole responsibility of whoever uses it. It is mandatory to use adequate eye protection, not to leave the machine working unsupervised, to have ventilation and fire extinguishing means within reach, and to check the travel path before running any job.

To the maximum extent permitted by applicable law, the rights holder will not be liable for direct, indirect, incidental, special or consequential damages—including harm to persons, to the machine, to the material, loss of work or lost profits— arising from the use of, or the inability to use, the program.

Using the program implies acceptance of these terms.

Privacy

The complete privacy notice, with the data that is processed and how to exercise your ARCO rights (access, rectification, cancellation and opposition), is published at app.rapilaser.com/legal and is publicly accessible.

The essentials: your designs, your images and your G-code do NOT leave your computer. They are saved in your browser and travel directly from it to your machine over the cable.

Third-party software

RapiLaser incorporates open source components, each one under its own license, and their notices are reproduced in full at app.rapilaser.com/legal.

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