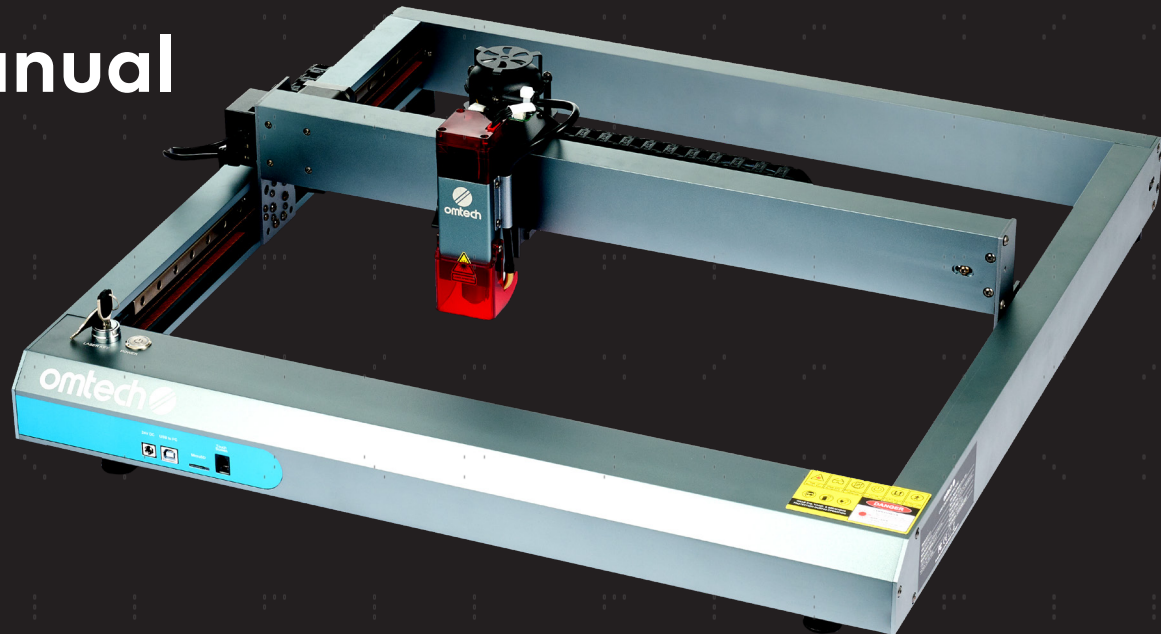# Light B10
User Manual

Beaming with Possibilities!

Thank you for choosing the OMTech Light B10 as your new laser engraver!

This diode laser is intended for personal and professional use. The Light is a Class 4 laser system: The active laser is visible but must be used with great care to avoid serious property damage and severe personal injury. It works by emitting a powerful 450 nm laser beam from a solid-state module; moving the module around on a gantry and frame; and using its focused light to etch designs into a wide variety of materials including wood and cork, paper and cardboard, some plastics, glass, cloth and leather, and stone. It can also be used with some specially coated metals. The provided module has an average lifespan around 15,000 hours before requiring replacement.

Read this manual before use, keep it for future reference, contact OMTech customer service if any point is unclear, and provide it with the machine if it is ever given or sold to another person.

Welcome to the OMTech Community!

and Happy **#LaserDay**!

For helpful hints and instructional videos, join us at our official laser group on Facebook and visit our channel on YouTube. If you encounter any problem with your engraver, email us at **support@omtechlaser.com** or **techsupport@omtechlaser.com** any time or call us at **(949) 539-0458** between 8 am and 4:30 pm Pacific Time Monday to Friday.

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Contents

Safety First!

Your Light is a **Class 4** laser system.

ALWAYS wear your laser glasses during use and avoid direct exposure to the laser beam.

ALWAYS be mindful of fumes, smoke, and debris created during engraving. Use a fume extractor if your material will produce any harmful byproducts.

ALWAYS stay near your engraver during use and be ready to put out a fire if needed.

For more safety information, see

Package List

Front Frame

Back Frame

Left Frame

Right Frame

X-Axis Gantry

Support Legs

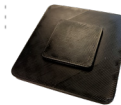10W Laser Module with Protective Shield

Power Cord

USB Cord

X Motor Cable

MicroSD Card and Reader with Software

Air Assist Fan with Tube

Focusing Tool

Hex Wrench Set

OD5 Laser Glasses

Cable Ties

Access Keys

M4×10 Bolts

M3×6 Bolts

Overview

Left Y-Axis Tension Adjustment

Left Y-Axis Restraining Bolt

X-Axis Stepping Motor

Left Frame with Belt

Laser Key and Emergency Stop Switch

Power Button

Power Connection

USB Control

X-Axis Gantry

Locking Lever

Air Assist Fan

Air Assist Tube

Back Frame

Right Y-Axis Tension Adjustment

Right Y-Axis Restraining Bolt

X-Axis Tension Adj.

X-Axis Restraining Bolt

Right Frame with Belt

Rotary and Protective Cover Connections

Flame Detection Sensor

Light

Laser Module

Protective Shield

Warnings

Diagnostic Tool Port

MicroSD Card Slot

Front Frame

Support Legs

omtech

Setup

Frame Setup

⚠️ Be careful of sharp edges during assembly. Wearing protective gloves is recommended.

For best results, in each part of assembly, place and partially tighten all fasteners before fully tightening any. If the belts are ever too tight in any step, see the section on Belt Tensioning below for how to loosen them.

1 Screw four support legs into place under the front and back frame pieces. For an additional inch (2.5 cm) of clearance, remove the pad from the bottom of the first set of legs and screw the extra support legs into the exposed holes.

⚠️ Be careful to avoid crossthreading. Never use or place the legs in any way that will leave the laser frame in an uneven position.

2 Place the left frame piece beside the matching end of the front piece. Connect the wire marked "Y" or "Y-Limit" to its receiver inside the front piece.

3 Remove anything binding the movement belt in the left piece and carefully fit the belt over its pulley inside the front piece.
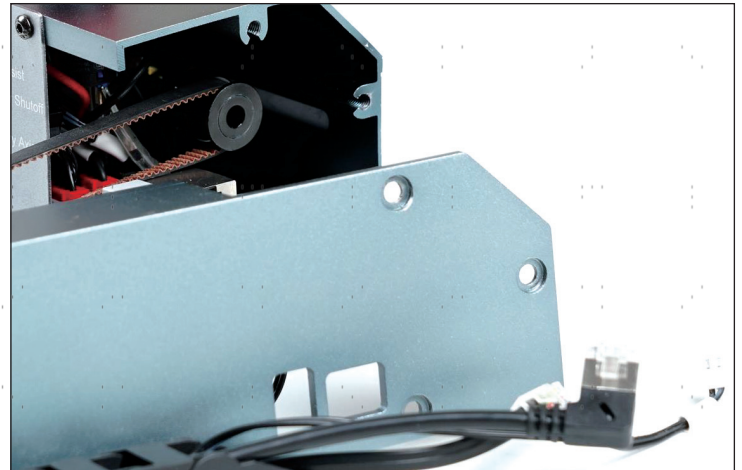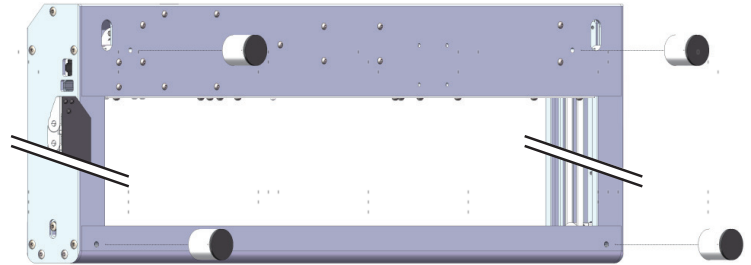
4   Align the bolt holes in the left frame piece with those in the front piece and use three M4×10 bolts to partially connect them.

5   Do the same thing with the left frame piece and the back piece. Be sure the support legs on the back piece are facing down.

6   Fully tighten all five bolts.
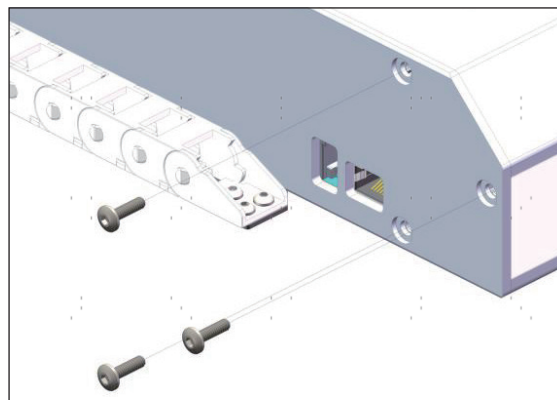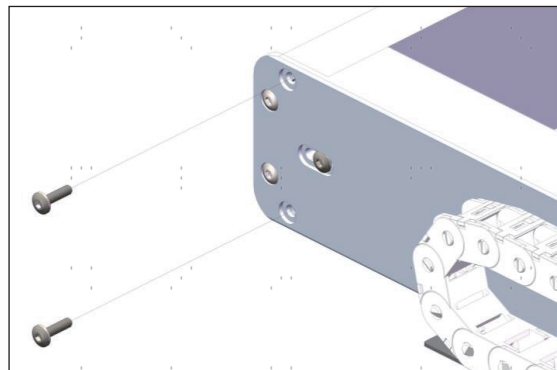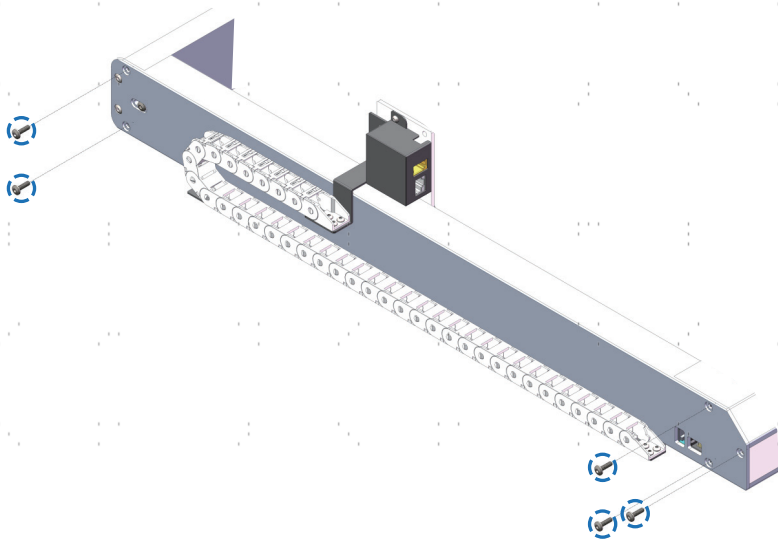
7   Repeat the same steps with the right frame piece.

⚠️ At this point, it is recommended to use a spirit level (not included) to check that all parts of the frame are completely level and plumb, adjusting their positions, legs, and fasteners as needed.
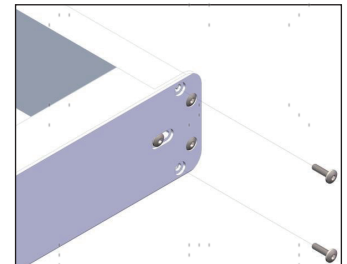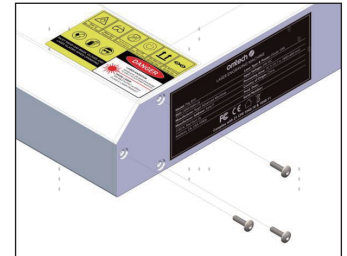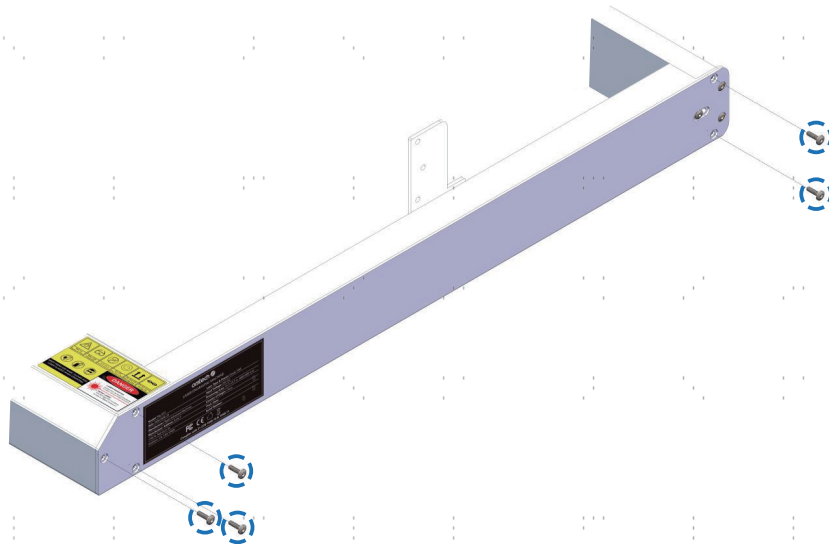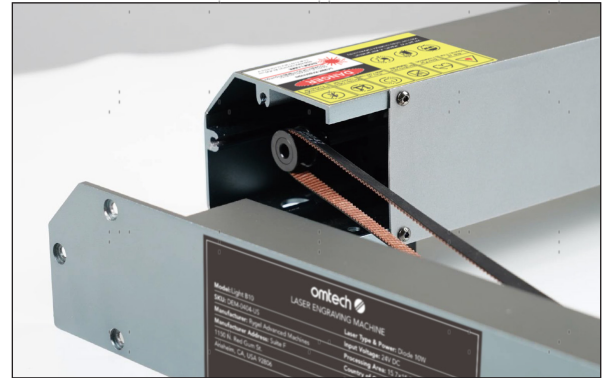
8   Place the X-axis gantry between its mounts on the two side pieces. The mount for the diode laser module should face towards the front of the frame. Connect the gantry to the mounts using two M4×10 bolts on each side. For best results, position and partially tighten all the bolts before fully tightening any.

    If the gantry cannot be connected because the mounts are not aligned, see Belt Tensioning below for how to loosen the belts. Once a belt is unlocked and loose, gently move it by hand so it is directly across from the other and then continue.

    Alternatively, loosen both sides and move both mounts to the back of the machine to align them. After attaching the gantry, this will also allow you to gently confirm that the belts move smoothly along their entire range of motion.
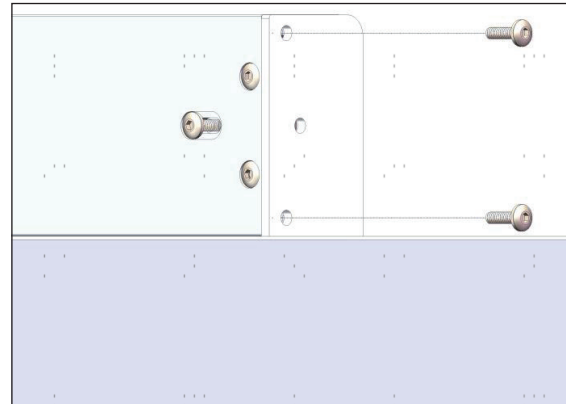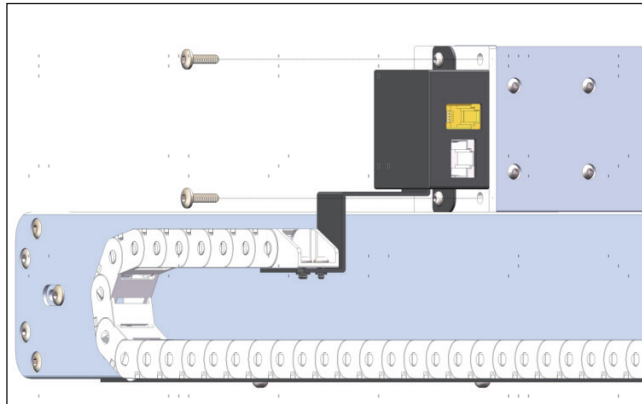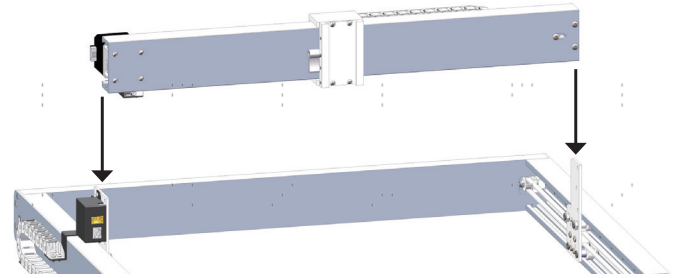
9   Place the fan so that its three bolt holes match those on the back side of the laser mount. Fix it in place using its M3×6 bolts.
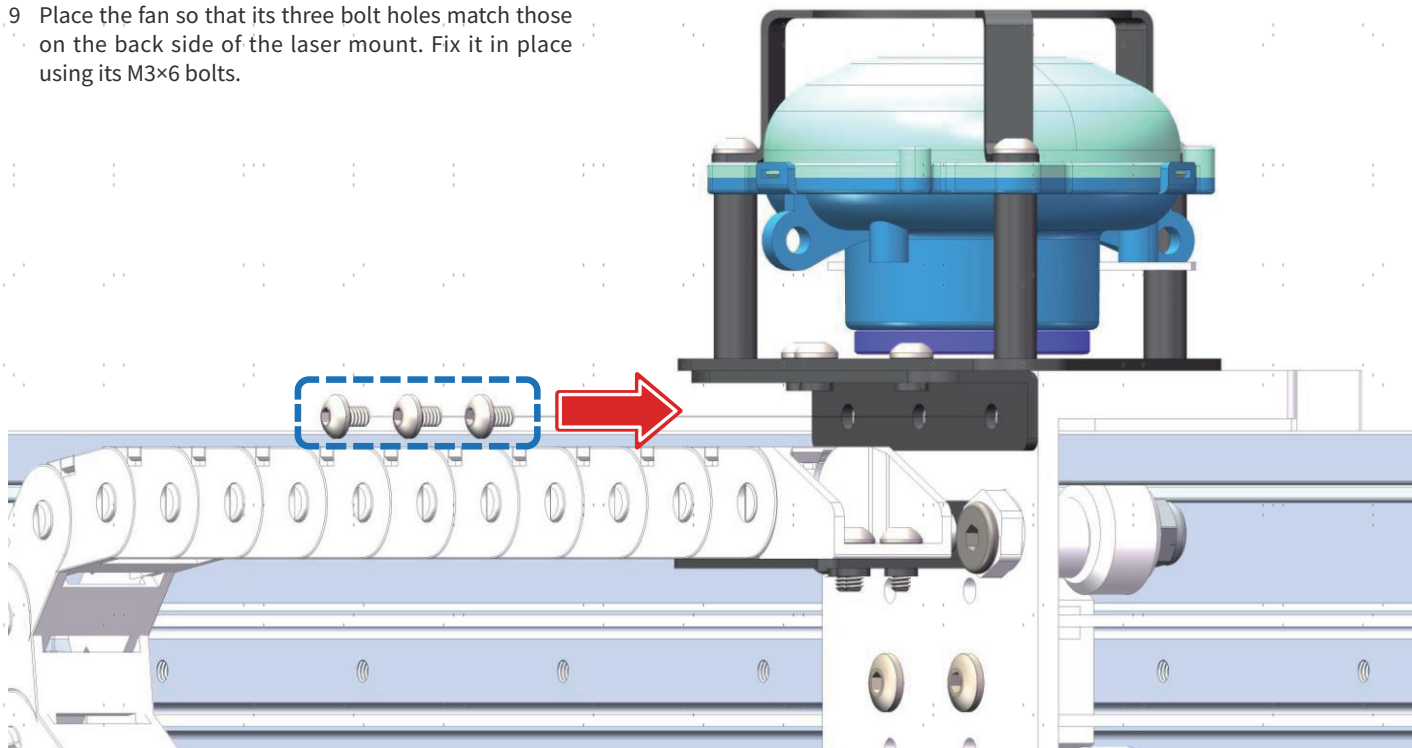
10 If it is not already installed, place the protective shield on the bottom of the laser head using one matching bolt on each side.

Use of this shield is highly recommended but it does **NOT** fully block the laser in all directions. Anyone nearby the laser during use should **ALWAYS** wear the provided laser glasses or eye protection that is similarly powerful (OD5+) at the laser's wavelength (400–450 nm).

11 Slide the laser module into its mount on the laser head. Gently rotate the lever on the left side up to allow easy movement and, once the module is well positioned, gently rotate the lever down to lock the module in place. If the lever does not turn smoothly, its restraining bolt can be loosened using the appropriate hex wrench. In the same way, the bolt can be fully removed to shift the locking lever up or down the mount to process thicker or thinner materials.

12 Once the module is in place, connect the air assist to the laser nozzle using the provided tube as shown. Make sure both ends of the tube are well secured.

⚠ The upper part of the tube should **ONLY** be inserted ¼–½ inch into the fan.
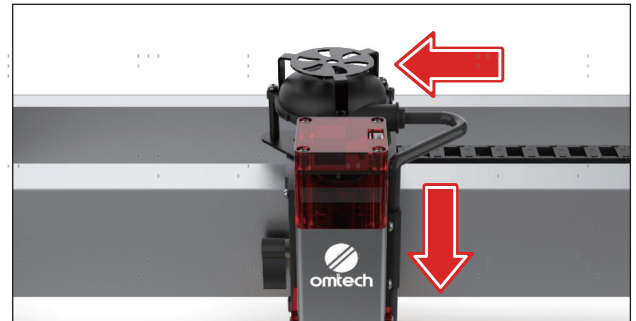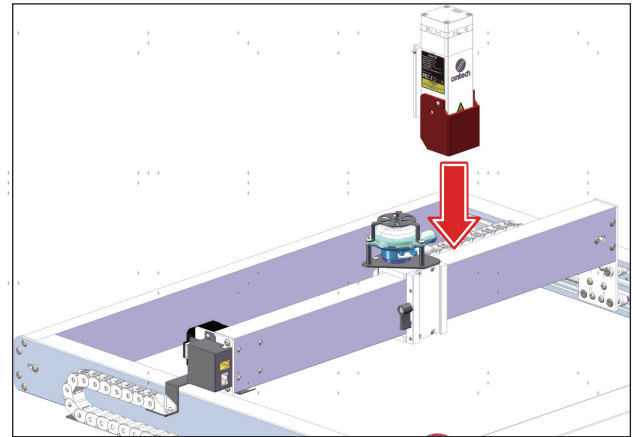
Belt Tensioning

⚠️ When the belts are loosened, be careful to move them slowly and evenly. Never force movement if any belt becomes stuck. Remove any obstruction, carefully adjust them, and try again.

Y-Axis Belts

1 Unlock the belt that you will adjust by turning its restraining bolt counterclockwise. The restraining bolt is the center bolt at the back end of each side.

2 Adjust the tension of the belt by turning its adjustment screw, reached through the hole at the far back of each side. Righty tighty, lefty loosey.

   Generally speaking, you want the belt fairly loose for manual movement. During normal use, it should be taut enough the X-axis gantry doesn't fall to the back when either end of the machine is raised but loose enough that the gantry isn't held firmly in place either. Instead, the ideal tension lets the gantry make a gentle controlled slide towards the lower end of the machine.

3 Once the tension is correct, retighten the restraining bolt by turning it clockwise.

X-Axis Belt

For the X-axis belt, loosen the restraint bolt on the right front side of the gantry, turn its adjustment screw inside the right end of the gantry, and then retighten its restraint bolt.

X-Axis Tension Adjustment

Y-Axis Tension Adjustment
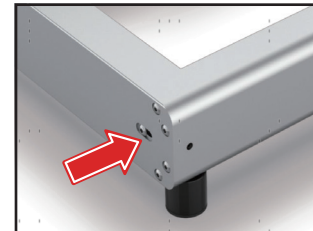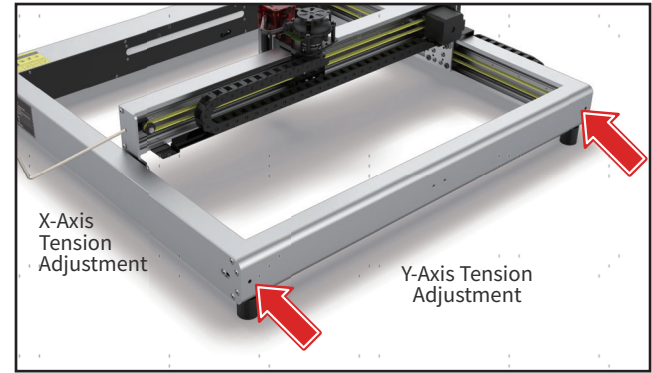
Loosen the Restraining Bolt
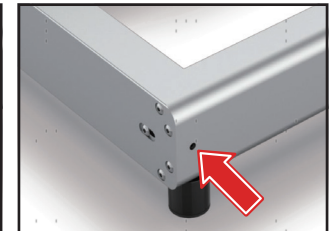
Adjust the Tension, Check, and Then Retighten the Restraining Bolt

Internal Wiring Setup

⚠️ In each step, be careful that each plug is fully inserted in the correct direction and is held snugly in place. Do not force any plug into any slot in the wrong direction.

1 There should be two wires coming from the upper end of the cable manager near the laser head, one marked "L1" with a wide red plug and another marked "AA1" with a narrow white plug. Place the wires around or under the fan—not above it—and connect the "L1" wire to the top of the laser head and the "AA1" wire to the front of the fan.

2 Get the short motor cable marked "XM1" and "XM2" that was included separately with your engraver's accessories. Plug the end marked "XM1" into the socket on the stepping motor behind the X axis gantry and the other marked "XM2" into the white top slot on the back of the gantry.

3 There should be three wires coming from the lower end of the cable manager near the stepping motor, one marked "L2" with a wide red plug, another marked "XL1" with a small black plug, and a third wire marked "TA1" with a narrow blue plug.

Connect the "L2" wire to the red lowest slot on the back of the gantry, the "XL1" wire to the black slot above that, and the "TA1" wire to the blue slot above that.

4 Connect the wire marked "AA2" to the one marked "AA3" as shown.
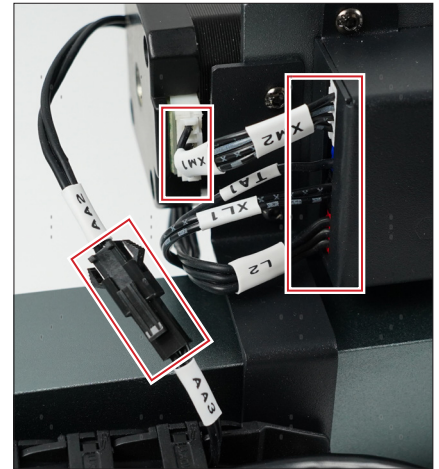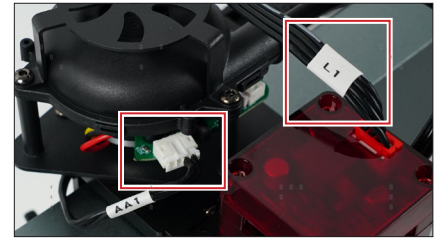
5   There should be two other unmarked wires coming from the upper end of the same cable manager, one with a wide plug and one with a narrow plug. Connect the wide plug to the larger bottom socket on the front of the gantry and the narrow plug to the smaller top socket.

6   There should be three wires coming from the lower end of the cable manager along the left piece of the frame, one marked "AA4" with a small white plug, one with a wide unmarked plug, and one with a narrow unmarked plug. Place the wire marked "AA4" under the left frame and connect it to the top port behind the front frame, marked "Air Assist". Connect the wide plug to the larger socket at the front of the left frame and the narrow plug to the smaller socket beside it.

7   If you have a protective cover to use with your engraver, the wire from its interlock device can be placed under the front or left frame and connected to the port marked "Interlock Connector" behind the front frame. If you have a compatible rotary device, its wire can be connected to the port marked "Rotary Axis" in the same place.

8   Use the provided cable ties to organize your wires as needed.

9   Loosen the three belts and gently move them through their full range of motion, checking that no wire becomes caught or obstructs the movement of the belts in any way. Make any necessary adjustments and then retighten the belts.
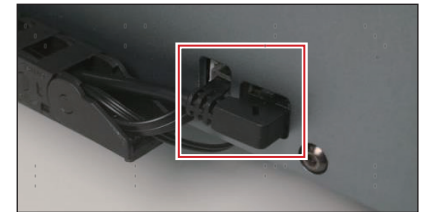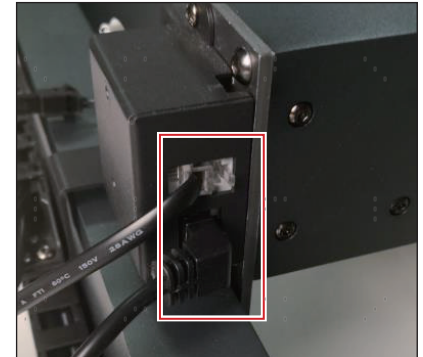
External Wiring Setup

1   Connect the Light to your control computer using the provided USB cable. If you need to use a USB extension cable, make sure the extension cable is in good condition and all connections are firmly made.

   ⚠️ It is not recommended to have your control computer farther than 15 feet (4.5 m) away from the laser to avoid potentially dangerous interference to the control signals.

2   Plug the control board into a stable, compatible, and well grounded outlet. Turn the laser key and press the power button. The Light's fan and light should turn on automatically. Leave the engraver on and connected during installation of its control software.
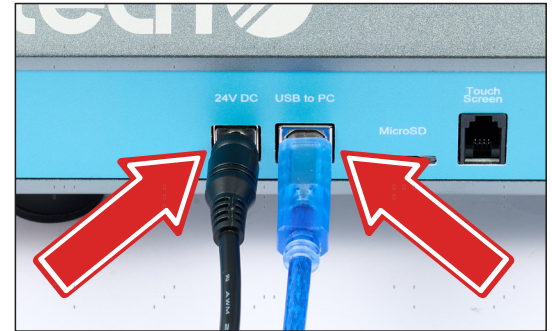
Software Setup

1 Your Light comes with a microSD card loaded with the open source engraving program LaserGRBL and a trial version of LightBurn. To access them, place the microSD card into its USB reader by sliding the card into the slot above the USB's handle. The ridge on the microSD card should face up, away from the reader's handle.

⚠️ **DO NOT** attempt to pull on the handle. It does not slide out.

2 Insert the reader into any available USB slot on your control computer. (The microSD card's ridge can be used to see which side is up.) Go to the LaserGRBL folder and run its installation wizard. Alternatively, you can also download the latest version of the program from Arkypita's website at lasergrbl.com/download or from us at omtechlaser.com/pages/software-download.

3 Open LaserGRBL. If it is in any language other than English, go to the 4th item on the main toolbar and select the top option beside the British flag. Restart the program when prompted.

4 Load the Light's parameters by going to **Grbl** on the main toolbar, selecting **Grbl Configuration**, and selecting **Import**. Load the Light_B10.nc file from the microSD card's LaserGRBL folder.

5 See if your engraver appears in the **COM** field. Most computers will not be able to communicate with the Light without the CH340 driver. Go to the **Tools** menu on the main toolbar and select **Install CH340 Driver**. Install the driver and then close the window using the X in the top right corner. You can also install the driver separately from the Driver folder on the microSD card.
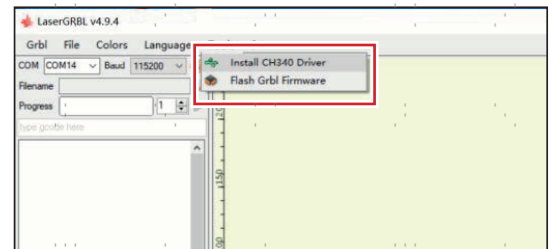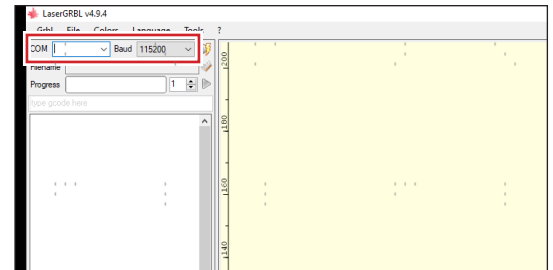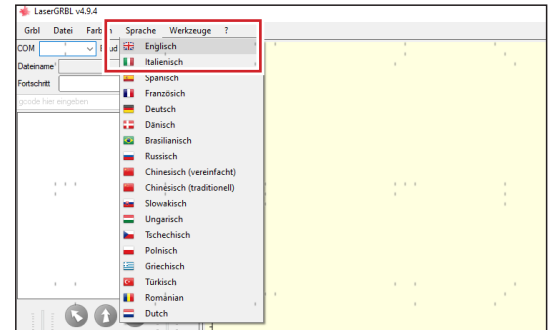
6 Select the Light's COM port and Baud rate (115200) on the top left. If more than one COM port is listed, find your laser by writing down all the ports listed and then disconnecting the laser's USB cord. The one that disappears from the list is your laser. Reconnect the cable to the same USB port and select the COM port that reappears. (If you change the USB port for your laser, the COM port number will also change and this setting will need to be adjusted.)

7 Click the 🐛 icon beside the baud rate or go to **Grbl** on the main toolbar and select **Connect**.

8 Check that the direction pad now moves the laser head around to confirm your connection.

9 Put on your laser glasses (if you haven't already), place a piece of safely laserable material under the laser head, and click on the **Blink** button along the lower toolbar. You should see a brief flash of light as your laser activates out of focus and at a low power setting.

⚠️ If the software appears to be connected and fully functioning but the laser does not activate at all, turn off your laser and disconnect it from power and your computer. Check all the wiring connections before restarting and trying again.
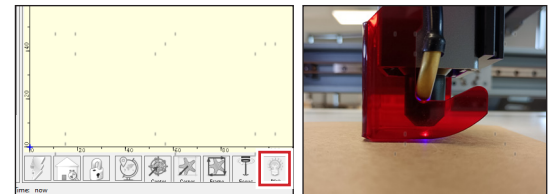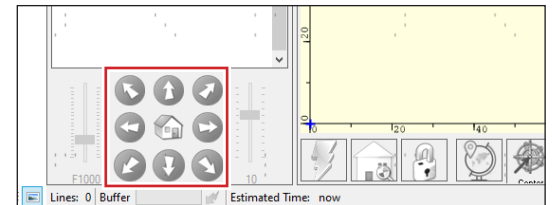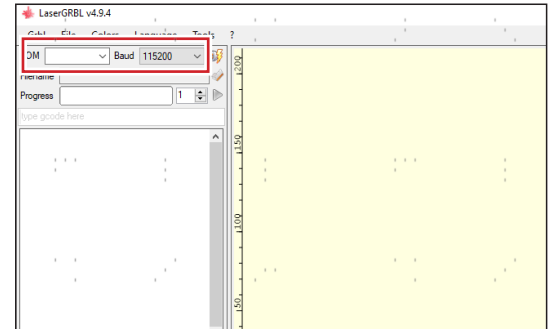
10   To use LightBurn for a free month-long trial, run its installation wizard from the LightBurn folder on the microSD card. Alternatively, you can also download the latest version of the program from its GitHub at github.com/LightBurnSoftware/deployment or from our website at omtechlaser.com/pages/software-download.

11   Open LightBurn. If it is in any language other than English, exit any popups, go to the 7th item on the main toolbar, and select **English**. Restart the program if the language does not automatically switch.

12   The **Devices** menu should open immediately. (If it does not, click the **Devices** button at the bottom right of the main interface.) Select **Import** and then load the Light_B10.lbdev file from the MicroSD card's LightBurn folder. Check that the new configuration sets the X Axis and Y Axis lengths to 400 mm. The default origin is at the front left corner but any orientation is fine so long as it matches your engraving files.

13   Your Light should now appear on the bottom right beside the **Devices** button. If your computer controls other engravers, you can select your Light each time from the dropdown menu or go the Devices menu, select your Light, and click **Make Default** to make it your first choice.

14   Use the controls on the left toolbar to make any simple shape and click **Frame** on the right to test that the program moves the laser head and that your design will fit your material. Put on your laser glasses & click **Start**. You should see the laser activate and move along your design.

15   If you find you still love LightBurn after your month is up, you can purchase your activation key at lightburnsoftware.com or from us at omtechlaser.com/collections/software.
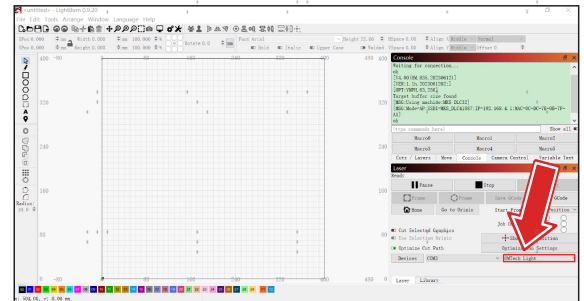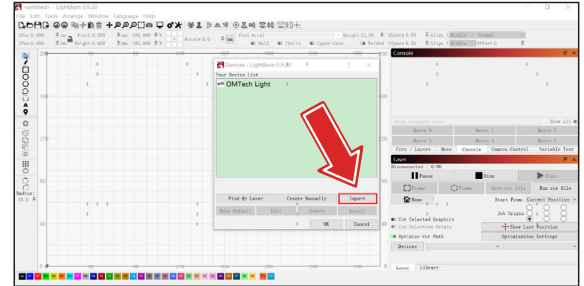
Automatic & Manual Air Assist

LightBurn

Follow these to set up your air assist with LightBurn

1. Click ![wrench icon].

2. Choose M7or M8.

⚠️ With M7 chosen, selecting "Air Assist" under Cuts/Layers—Cut Settings Editor will set the air assist on an automatic start. If you do not select "Air Assist" under Cuts/Layers—Cut Settings Edito, the air assist fan shuts off automatically.

⚠️ With 8 chosen, the air assist fan remains off irrespective of "Air Assist" under Cuts/Layers—Cut Settings Editor being selected or not.

⚠️ If the popup window doesn't show M7 and M8, expand the window to reveal.
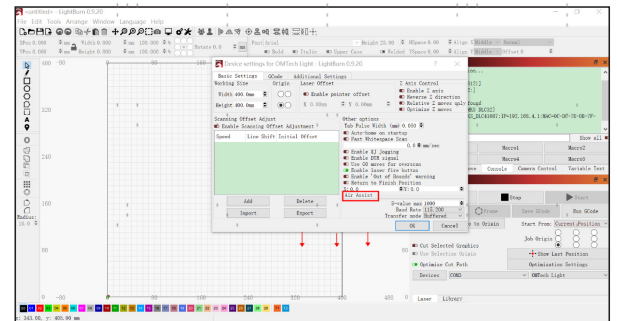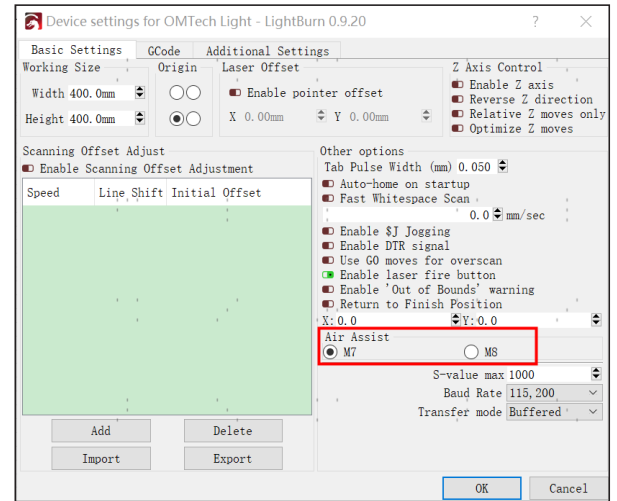
3. Click [OK] to save and exit.
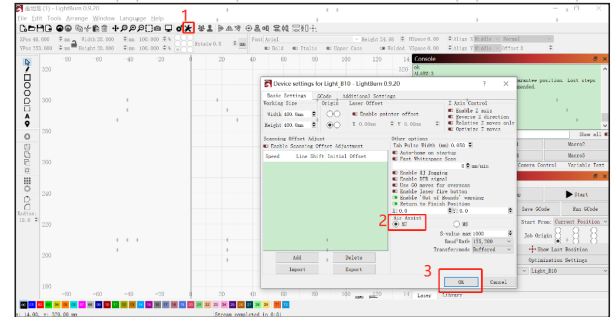
Alternatively, you can use the following instructions to customize your automatic air assist, which can start and stop automatically on a specific engraving layer.

1. Click [Cuts / Layers].

2. Double-click [C00 C0] to select the layer or cut that needs automatic air assist.

3. Click the icon before "Air Assist" so that it becomes green [● Air Assist].

4. Click [OK] to save and exit. Now the air assist fan can start on the set layer and stop when the engraver of that layer is done.
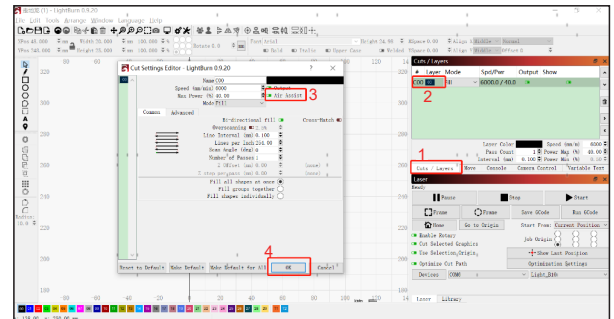
To manually control the air assist,

1. Click "Console"

2. Put in "M7" and hit Enter. This will start the air assist.
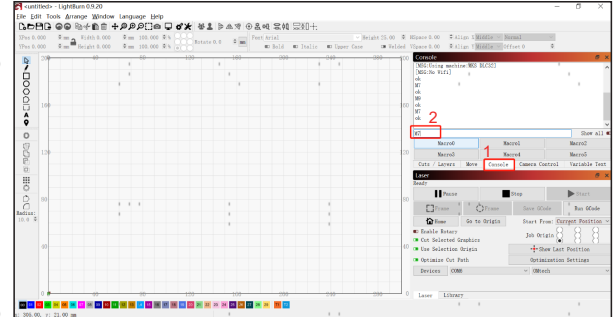
To manually close the air assist,

1. Click "Console"

3. Put in "M9" and hit Enter. This will stop the air assist.
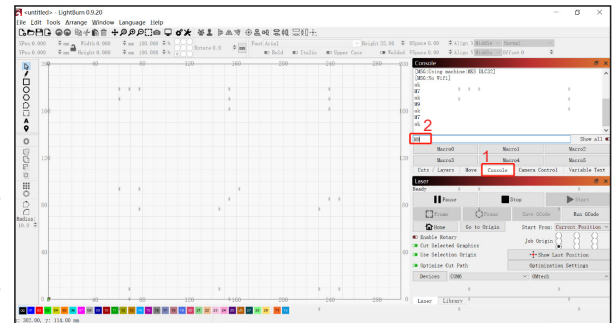
⚠️ Do not manually control the air assist while the engraving is in process.

LaserGRBL

As with LaserGRBL, the air assist can only be controlled manually.

Put in "M7" and hit Enter. This will start the air assist.
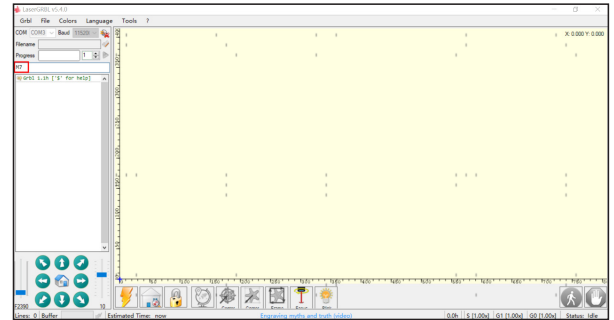
Put in "M9" and hit Enter. This will stop the air assist.
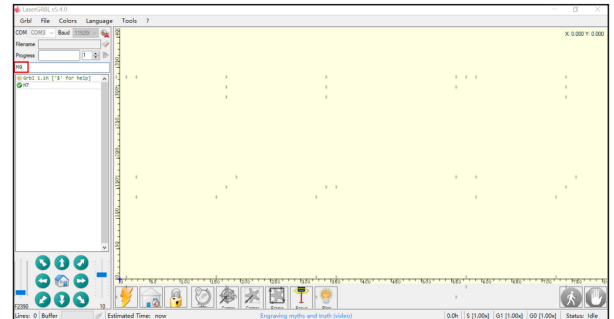
⚠️ Do not manually control the air assist while the engraving is in process.

Initial Testing

Belt Tension

After all setup is completed and before you begin full use of your machine, check again that the belts are properly tensioned and that all the wires are safely placed. See Belt Tensioning above for details.

Emergency Stop

Because of the risk of fire and other hazards during engraving, you should test that your laser key functions as an emergency stop before conducting any further work with your machine. Put on your laser glasses, place a piece of laserable scrap material under the laser head, and hold the Blink button in LaserGRBL or run a simple pattern in LightBurn. Turn your key off and confirm that the laser stops instantly despite the power button remaining down. If the laser continues to fire, the laser key is not working and should be replaced before the engraver can be used. Turn off your Light and contact customer service.

Alternatively, the in-built gyroscope stops the laser when it detects a tilt between 20–40°. Repeat the steps for the laser key except for turning it. Tilt your engraver by 20–40°and confirm that the laser stops instantly within this angle range despite the power button remaining down. If the laser continues to fire, the gyroscope is not working and should be replaced before the engraver can be used. Turn off your Light and contact customer service.

Fire Detection Sensor

Because of the risk of fire during engraving, you should test that the laser's infrared flame sensor functions before other work with your machine. Make sure the button next to the fire detection sensor is **UP**. Put on your laser glasses, place a piece of laserable scrap material at the far end of the bed, move the laser over it, and hold the **Blink** button in LaserGRBL or begin running a simple pattern in LightBurn. Light a small candle in a safe holder and carefully place them at the front of the bed. (You can also use a lighter but be extremely careful to avoid burning yourself, damaging the machine, or setting fire to any material.) If the laser continues to fire after ten seconds, the sensor is not working and should be reconfigured or replaced before the engraver can be used. Turn off your Light and contact customer service.

Perform a similar test if you are using a protective cover. Begin using the laser and confirm that it stops automatically when the door to the cover is even slightly opened.
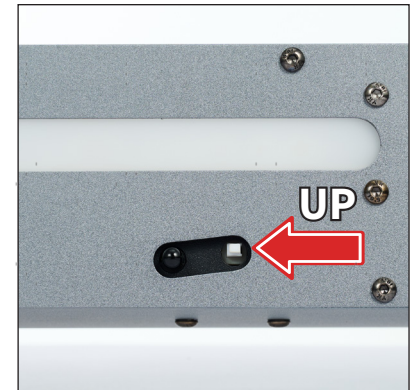
Done!

Normal Operation

1 Turn Everything On

Turn the laser key and press the power button beside it. Turn on your computer, open your engraving software, and select or connect to the laser.

2 Load Your Design

Load your design, converting it as needed, and set your engraving parameters.

See below for details on doing this using LaserGRBL. For more details on LightBurn, see its separate instructions or visit its help forums.

3 Focus the Laser Head

Position your material, release the locking latch on the laser head, and adjust the laser's height using the provided tool. For surface engraving, the bot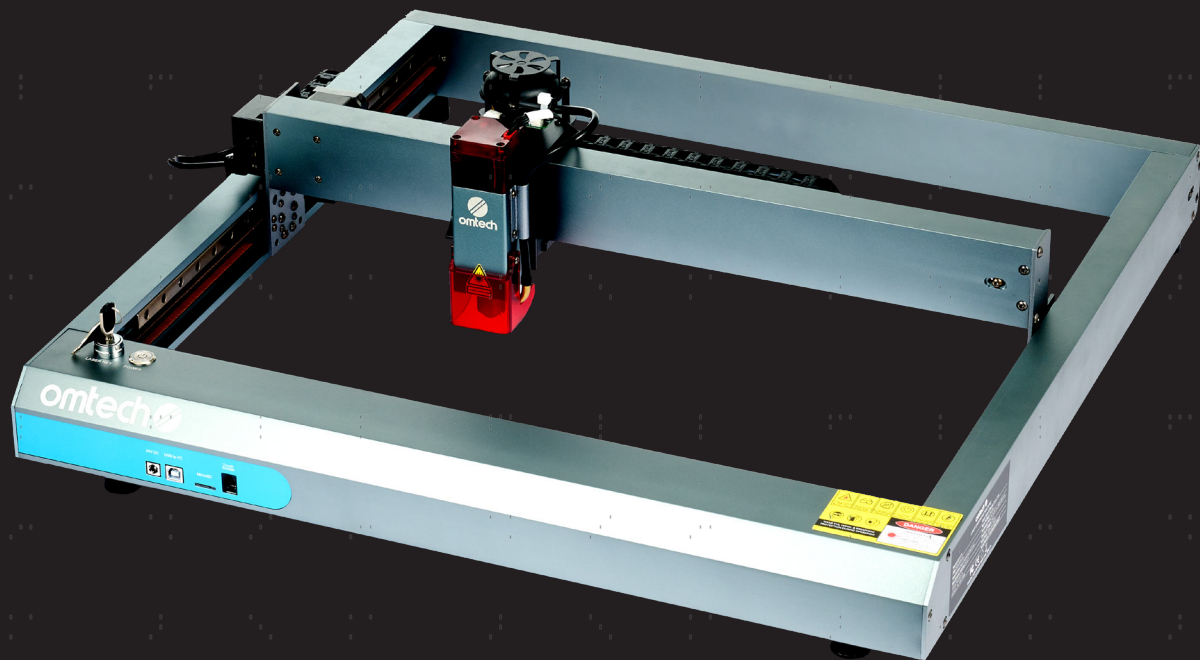tom of the laser module tube—not the protective shield—should be able 6 mm above the surface of your material and the bottom of the laser module proper should be about 30 mm above it. For cutting, the focus can be moved slightly lower into your material.

For best results, use a honeycomb bed or similarly support below your material to allow good airflow on both sides.

4 Begin Engraving

Put on your laser glasses. With LaserGRBL, start work by pressing ▶ or by going to **File** on the toolbar and selecting **Send to Machine**. If you need to adjust things during engraving, press the ■ button to stop. Use the overrides or go to File and select **Reload Last File** to change your design's settings.

⚠️ For a longer service life of your focal and protective lenses, it is recommended that you turn on the air assist fan before engraving.

5 Repeat

Adjust your settings based on the results from your first run and repeat. You can also run multiple designs at one time by going to **File** and selecting **Append File**. Use the Offset values to position the extra designs out of each others' way.

If you'll be making more batches later, once you know all the settings are perfect, save the GCode by selecting **Quick Save**.

6 Tidy Up

Turn off the laser and disconnect the control board from power. Remove any debris left in your work area and clean any dust off of the laser lens and gantry.

The most important parameters are the focus, power, and speed settings. Together, they control the intensity of the beam as it contacts your material.

FOCUS

The lens has a focal length of 30 mm (about 1.18 inches) and rests 24 mm above the bottom of the laser module's tube. For surface engraving, release the locking lever and gently lower the tube to touch the top of the provided tool each time the thickness of your material changes. This will keep the laser focused at the surface of your material for maximum efficiency. For cutting thicker materials, the focus may need to be moved lower into the material itself.

POWER

By default, LaserGRBL uses ¹⁄₁₀ percent power settings, so that S1000 is 100% of the diode's full power (10W), S750 is 75% power (7.5W), and so on. You can change this scale using parameter $30 in your GRBL configuration. You can also limit the power for each design separately by using its S-MAX value.

Unlike CO_2 lasers, your diode can use its maximum power without excessive wear. Still, start off at the lowest end of expected settings when working with new materials. If the effect is not yet strong enough, you can always rerun the design loop or rerun it with more powerful settings.

SPEED

LaserGRBL's speed settings are all in mm/min, so that F600 is 600 mm/min or 10 mm/s. The speed works with the power to create the intensity of the beam. Starting out with a material test card can give you a quick overview of what different combinations will look like. You can also use the M4 dynamic mode for your design to automatically reduce the power when the laser slows or stops at the edges of the design.

6 mm   30 mm
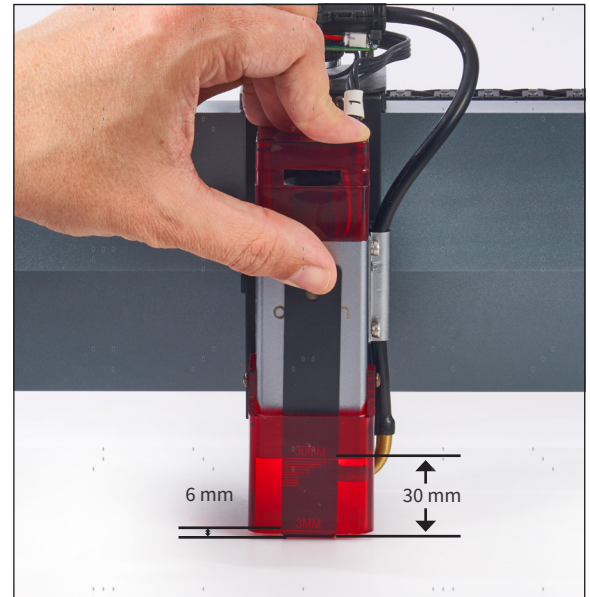
Pass-Through

To work on longer pieces, just slide them through under the sides of the frame. If you elevate the Light to pass thicker materials through the work area, adjust the focus to match and make sure the Light is completely level and stable. Never use the engraver on supports that might wobble or slip during use.
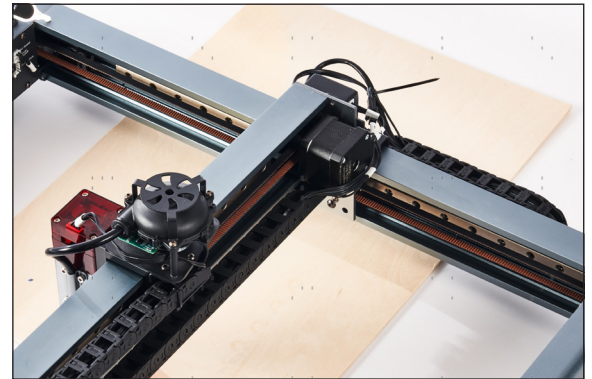
Rotary Axes

To work on round objects, connect a rotary axis (sold separately) to the **Rotary Axis** port on the inside of the front frame. The button beside the port should be **UP** during rotary use and **DOWN** to use the Y axis. Elevate the frame or lower the work surface so that the laser will be at the correct focal distance from the top of the material being rotated. Position the gantry so that it is over the center of your object and configure your software so that the Y axis information will be used to turn and engrave your object.
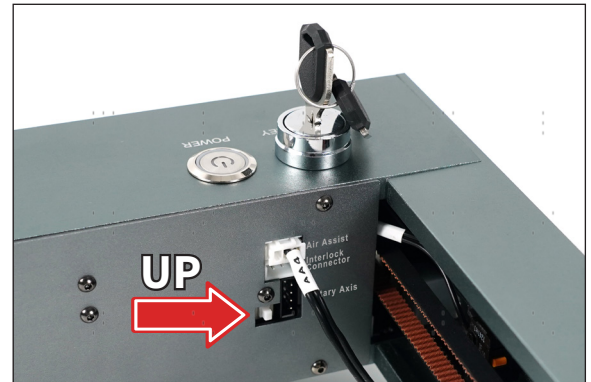
LaserGRBL

Main Interface

A. **Toolbar**—This area controls general configuration (**Grbl**), file loading and saving (**File**), the display theme (**Colors**), the display language (**Language**), driver installation and control board flashing (**Tools**), and helpful links (**?**).

B. **Connection Control**—This area connects the computer to the laser.

C. **File Control**—This area displays the currently loaded file and its progress.

D. **Command Field**—This area allows you to input direct gcode commands.

E. **Command Log**—This area shows the commands for the current session, whether manually entered or automatically generated by your file.

F. **Movement Control**—This area moves the laser head by the set distance controlled by the right bar in mm at the speed set by the left bar in mm/min.

G. **Line Count**—This displays the total number of engraving rows for the currently loaded design.

H. **Projected Time**—This displays the estimated time to finish the design.

I. **Main Display**—This displays a preview of the currently loaded design and the laser head's current position during engraving.

J. **Command Buttons**—This area has various buttons that execute a series of commands together. Right click the empty area to create or import new buttons. The usual default buttons are reset (⏍), home (⌂), lock (🔒), and set new origin (🌐).

K. **Command Overrides**—This area allows you to establish new power and speed commands in the middle of a session without stopping and restarting.

L. **Status Display**—This displays the current state of your laser.
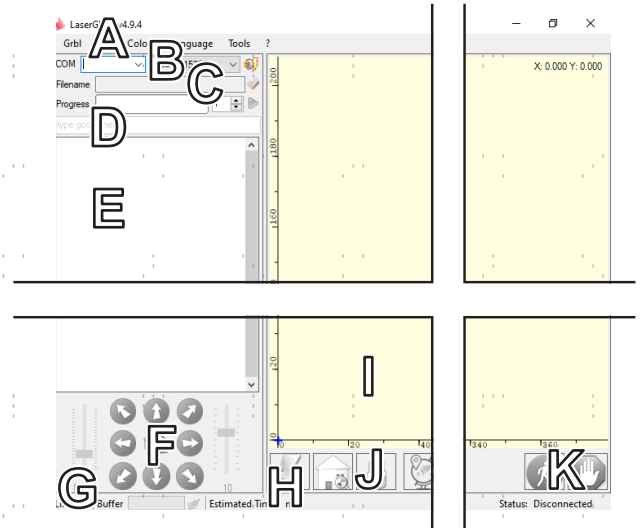
Importing Image Files

To engrave an image, go to **File** on the toolbar and select **Open File**. All compatible file types in the selected folder will be available. After you select your image, the **Import Image** window will open.

A. Main Display—This toggles between displaying the original image and a preview of what it will look like under the window's current settings. For normal line engraving, you must separately click the **Line Preview** box to see the image with its engraving lines.

B. Command Buttons—Use these buttons to rotate, flip, crop, or invert.

C. Resize—This actually controls whether the image is smooth or granular.

D. Grayscale—This provides several options for converting the image to the black, gray, and white form the engraver will be able to use. Black areas will be engraved at full power, gray areas will be engraved at the corresponding fractional power, and white areas will be left untouched. Click the **B&W** box if you want no intermediate gray areas at all.

E. Adjustment Sliders—These control the brightness, contrast, and fully white areas of the image. **Brightness** and **Contrast** are percentages with a 100% central value for "no change". **White Clip** is a scale from 0 to 100.

F. Conversion Tool—This toggles the conversion method for the image and changes the options below. Normally, the images are converted to 3 horizontal lines per mm. This can be changed to vertical or diagonal lines with resolutions of 1–20 lines/mm. **Dithering** uses a pointallist effect similar to stippling. **Vectorize** simplifies the image into large fields that can be adjusted or filled in various ways. **Centerline** can be used to most efficiently engrave simple line images. Use **Passthrough** to leave the file unprocessed except for the machine's gcode settings.
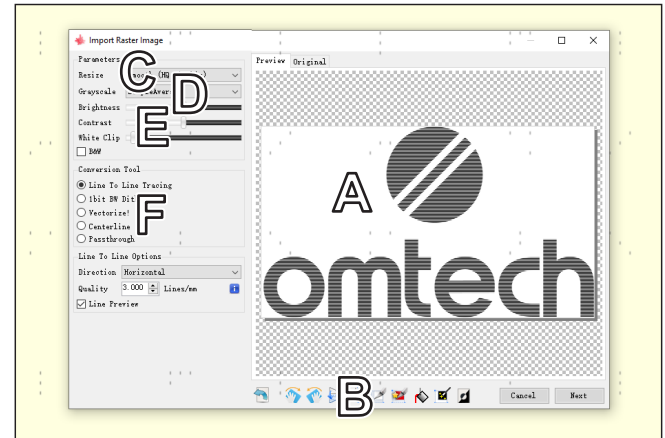
Processing Image Files

After clicking **Next**, you will open the **Target Image** window. This allows you to set the overall parameters for the current engraving session.

A. Speed—This sets the maximum engraving speed in mm/min. This speed must be accelerated to after corners and edges, which can cause some areas to be engraved darker than intended.

B. Laser Mode—This allows you to toggle between **constant power (M3)** that uses 100% of the S-MAX setting for black areas, fractional power in gray areas corresponding to its darkness, and the S-MIN setting for white areas and **dynamic power (M4)** that adjusts the M3 values to try to compensate for the slower speeds around the corners and edges.

C. Power Settings—These settings control the power level that will be used for pure white areas **(S-MIN)** and pure black areas **(S-MAX)** during engraving. The default settings are 0 and 1000 using a ¹⁄₁₀ percent scale. If you adjust the $30 parameter, the values need to be changed to match.

D. Image Size and Position—After processing, the image can be resized automatically to use a set number of dots per inch **(DPI)** or to fit a certain width **(W)** or height **(H)** in mm. The default is to maintain the proportions of the image. Click the lock icon open if you want to distort the image by changing its width and height separately.

By default, engraving begins from the front left corner of the work area. The **Offset** value can be used to begin from a different position, entered in mm away from the origin. Press the recycle icon to remove this. Press the ◎ icon to use the center of the work area as the origin.

Once everything is perfect, click **Create!** to begin engraving!
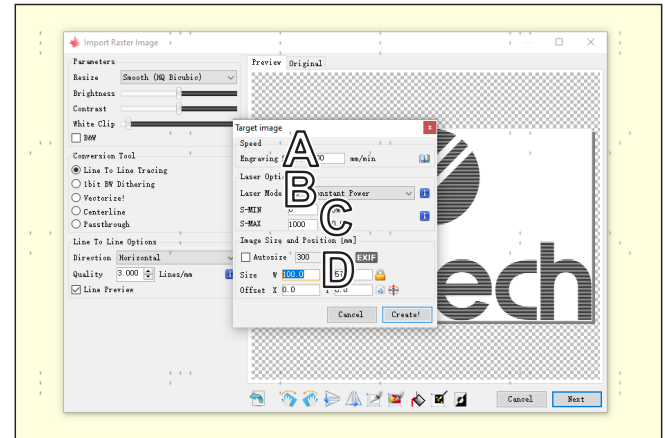
Important GCode Commands

Your Light can also process direct commands for movement and engraving using GCode. Commands can also be used to adjust the machine's parameters, which can be seen by typing $$ or by going to **Grbl** on the toolbar and selecting **Grbl Configuration**. The most important commands are:

M3	Activate the laser in constant power mode
M4	Activate the laser in dynamic power mode
M5	Deactivate the laser
S####	Adjust the laser power setting using the current power scale set by $30
F####	Adjust the current speed setting in mm/min
G0	Move at full speed ("G0X10" will move the laser head 10 mm right from the origin, accelerating to the max speed set by $110 and "G0 X10 Y10" will do the same, moving 10 mm right and back)
G1	Move at the current speed ("G1X10" moves the laser head 10 mm right from the origin to speed set by F####; if no such speed has been set, the command will be ignored)
G2	Activate the laser and draw a line ("G2X10" draws a straight line from the current position to 10 mm right of the origin and "G2 X10 Y10 I20 J30 F10" draws an arc to 10 mm right and back from the origin along a circle with its center at X=20, Y=30 at a speed of 10 mm/min.)
G90	Use absolute position from the origin ("G0X10" will move the laser head 10 mm right of the front left corner and stay there)
G91	Use relative position from current location ("G0X10" will move the laser head right 10 mm every time it is entered)

$$	Display the current parameter settings
$3=#	Reset the engraver's origin: 0 is the default front left corner, 1 is the front right corner, 2 is the back left corner, and 3 is the back right corner.
$30=####	Reset the engraver's power scale: 1000 is the default using 10ths of a percent, 100 would use simple percents, and 10 would correspond to the laser's watts of actual power.
$100=### $101=### $102=###	Reset the engraver's steps per mm along the X, Y, and Z axes. When using a rotary axis, the adjustment necessary is the current value × the desired distance ÷ the actual distance.
$110=#### $111=#### $112=####	Reset the engraver's max speed in mm/min. along the X, Y, and Z axes. If you notice jagged/misshapen effects, it may be necessary to lower these values. Do not set higher than 15000 mm/min.
$120=#### $121=#### $122=####	Reset the engraver's max acceleration in mm/s² along the X, Y, and Z axes. These values can also be reduced to reduce stuttering, but will cause further darkening along edges.
$130=### $131=### $132=###	Reset the lengths of the engraver's X, Y, and Z axes. This should never be changed with the 400×400 mm base Light system but will need adjustment if you use a frame expansion.

Onward and Upward!

Visit omtechlaser.com to further expand your laser's capabilities or to browse through our full range of laser products, equipment, and accessories.
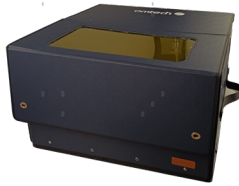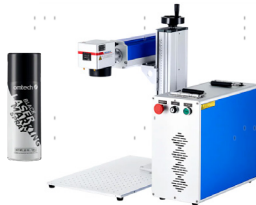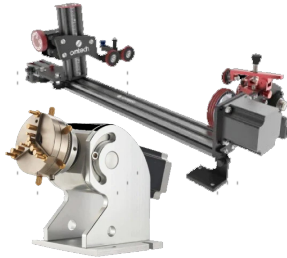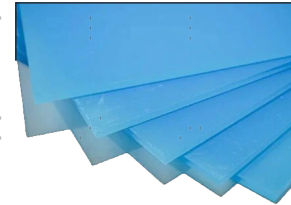
Protective
Enclosures

Honeycomb
Beds

Inline Fans
and Ducting

Metal Engraving
Spray and Lasers

Chuck & Roller
Rotary Axes

Standardized
Materials

Safety Considerations

General Safety

Only use this device in accordance with these instructions and all applicable local and national laws and regulations. Read this manual completely before use, keep it for future reference, and provide it with the machine if it is ever given or sold to another person. The Safe Use of Lasers (Z136) standards from ANSI do not have the force of law but can be consulted for further details and often form the basis for state or professional laser safety rules.

DO NOT allow use by minors, by untrained personnel, or by any personnel suffering from any physical or mental limitation that might affect their ability to use the device safely and properly. Untrained personnel who might be near the device while it is in use must be informed of its potential danger and how to avoid injury.

Keep the area around the engraver dry, well ventilated, and environmentally controlled to 40–104°F (5–40°C) and 20–85% humidity. During use, the area should be clean and well lit to minimize the potential for accidents.

Laser Safety

The active laser and its reflections can rapidly cause fires, burns, and permanent vision damage.

Take steps to prohibit access to the area around the laser during use. Anyone nearby during use should have protective laser eyewear rated OD 5+ at the laser's wavelength. Even with protective eyewear, do not stare or allow others to stare at the active laser continuously.

DO NOT modify this device or disable its safety features except as specifically instructed by customer service or a trained technician.

ONLY use this laser when it is well placed on a stable and level surface able to easily bear its weight and the weight of your material. If your laser may cut through the material you are working with, make sure that the surface under the engraver is neither flammable nor highly reflective. If your laser ever begins to wobble or move during use, cease use of the laser until you have adjusted the device or its speed and acceleration settings so that it remains completely stable during use.

DO NOT use this laser in dewy, dusty, or high-EMI conditions where the active laser might easily be deflected or reflected.

Electrical Safety

Only use your Light with stable, compatible, and well-grounded power sources. For best results, do not place other devices on the same circuit as your engraver.

Make sure electrical connections are completely firm. Always insert and remove the plug using the plug itself and not the power cord.

Do not allow any electronic component to become wet and **ALWAYS** fully disconnect the engraver from power before undertaking cleaning, adjustment, maintenance, or repair. Only allow trained electricians to adjust electronic components.

Material Safety

Never leave this device unattended during use. Do not leave potentially combustible, flammable, explosive, or corrosive materials near this laser. Keep a fire extinguisher nearby in case of accidents and familiarize yourself with its proper range before use to avoid potential blowback.

Remove all dust and debris from the main bay at least once a day. Keep the laser's lens clean. Over time or in excessive amounts, dust left on its surface can heat and degrade the lens, ruining the laser module.

Users of this engraver are responsible for confirming that the materials to be processed can withstand the heat of the laser and will not produce any emissions or byproducts either harmful to people nearby or in violation of local and national air safety regulations. Seek out material safety data sheets (MSDS) for new materials. Never attempt to engrave polyvinyl chloride (PVC), teflon, or other halogen-containing materials under any circumstances. Some materials may require an additional exhaust system to remove the dust and gas produced. Immediately stop use if this exhaust system malfunctions while working on such a material.

Users of this engraver are responsible for ensuring that every person present during use has sufficient personal protective equipment (PPE) to avoid any injury from the work. In addition to the protective laser eyewear mentioned above, this may require goggles, masks or respirators, gloves, and other protective outer clothing.

This machine can safely be used with:

- Cardboard
- Ceramics
- Glass
- Leather
- Paper & Paperboard
- Most Plastics
- Rubber
- Stone
- Textiles
- Wood

It cannot be used with the following materials or any materials including them:

- Artificial Leather with Hexavalent Chromium (Cr[VI])
- Astatine
- Beryllium Oxide
- Bromine
- Chlorine, including PVB, PVC, Vinyl, etc.
- Fluorine, including PTFE, Teflon, etc.
- Iodine
- Most Metals
- Phenolic Resins, including the various kinds of Epoxy
- Polycarbonate

Warning Labels

Your Light should come with warning and information labels in the following locations:
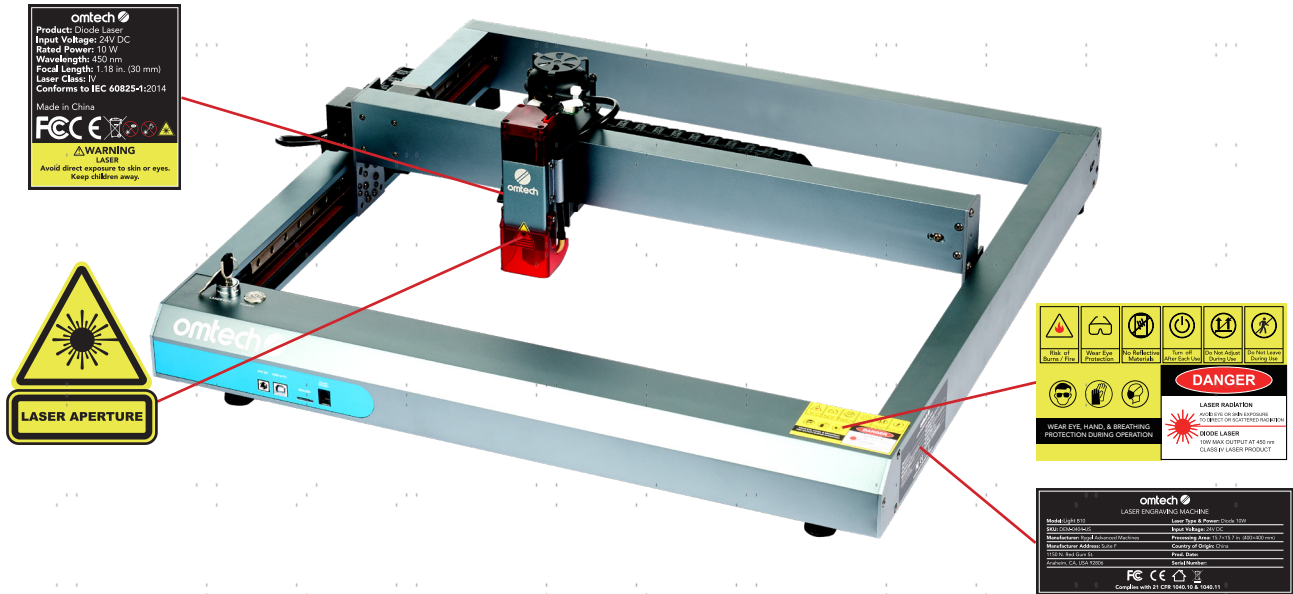
If any of these labels is missing, illegible, or becomes damaged, it must be replaced. Contact Customer Service for the image files to use.

Maintenance Schedule

⚠️ Before any cleaning, maintenance, or repair work, **ALWAYS** switch the Light off and fully disconnect it from power. Remember as you clean that dust near the active laser or its possible reflections is a fire hazard. **ONLY** allow trained professionals to modify or disassemble this device.

EVERY DAY

- Check the **FOCAL LENS** below the laser head before or after each use. Gently remove the laser module, use the provided hex wrench to loosen the restraining bolt, and remove the laser module tube to access the lens holder. When cleaning is needed, blow any large debris off the surface of the lens and then use a lens cloth or cotton swab doused in alcohol or a laser-safe cleaning solution in gentle circular motions. Replace the holder and tube and retighten the restraining bolt. Wait for the cleaning fluid to completely dry before further use. Carefully unscrew the lens holder ring if you ever need to change the lens itself.

- Remove any debris from the **WORK AREA** and clean dust off the **FRAME** at the end of each day. Use a soft dry cloth whenever possible. Do not allow any electronic component to become wet and never use caustic chemicals or harsh abrasives.

EVERY WEEK

- Check the **BELTS** and **TRACKS**, clearing any dust or debris that hasn't been removed yet. Check that the tension on the belts is correct by gently lifting one side of the machine. The X-axis gantry should slowly move towards the lower side. If it moves too quickly, tighten the belts until it slows. If it fails to move at all, loosen the belts until it moves slowly but smoothly.
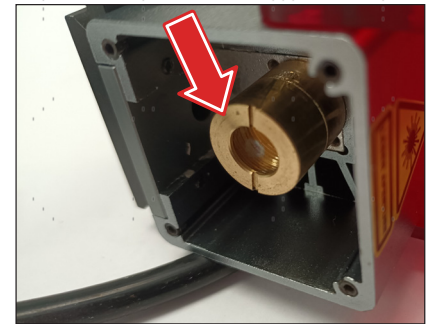
EVERY MONTH

- Check the **FRAME** at least once a month to see if any metallic components are starting to bind. Clean them if needed with a soft dry cloth and apply a light layer of white lithium grease. Gently move the laser head and X axis through their range of motion to spread the grease along the X-axis rail and both Y-axis rails.

Troubleshooting

If you find your engraver producing irregular images, begin by checking the belts' tensioning, the bolts' tightness, the frame's cleanliness and straightness, and the work area's stability. If all of those are fine, simplify your design or use lower speed and acceleration values for your current project by adjusting the $110, $111, $120, and $121 parameters. Never set them higher than the system's 15,000 mm/min. maximum.

Legal Terms

Statement of Conformity

OMTech declares that this product is in compliance with the requirements and provisions of Directive RED 2014/53/EU and the RoHS directive 2011/65/EU and (EU) 2015/863.

FCC Statement

This device complies with Part 15 of the FCC rules and with the FCC radiation exposure limits set forth for an uncontrolled environment. It should be installed and operated with at least 8 inches (20 cm) of distance between any person and the laser tube. More distance may be required for those with older pacemakers or similarly sensitive medical equipment.

Disclaimer

Your Light may differ somewhat from those shown in this manual due to options, updates, etc. Please contact us if your engraving machine came with an outdated manual or if you have any other questions.

Misuse or unauthorized modification of this device, in addition to risking serious property damage and severe personal injury, may also void its compliance with US and EU regulations and voids any warranty either stated or implied.

These instructions are protected by international copyright and cannot be legally reproduced, transcribed, electronically transmitted, or translated into another language without the prior written authorization of OMTech.

Disposal

Electrical products should not be disposed of with household products. In the EU and UK, according to European Directive 2012/19/EU for the disposal of electrical and electronic equipment and its implementation into national laws, used electrical products must be collected separately and disposed of at the collection points provided for this purpose. Locations in Australia, Canada, and the United States may have similar regulations. Contact your local authorities or dealer for disposal and recycling advice.

Register Your Engraver

Activate the warranty for your new laser by using the appropriate app on your smartphone or other device to scan the QR card to the right or by going to omtechlaser.com/pages/warranty.

You'll need the serial number for your machine found on the label on its right frame.

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Anaheim, California, USA

omtechlaser.com