

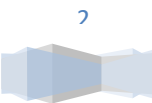
INSTRUCTION MANUAL – OCTO PRO 44W LASER HEAD



Version: 3.0

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## GENERAL

### OCTO PRO 44W LASER HEAD OVERVIEW

The new Octo PRO 44W laser head is the optical combination of eight 7W PRO laser diodes. They are combined and then the beam is collimated and compressed into a square, increasing the power density and making the beam approximately equal in both axes.

The magnetic shroud allows for easy mounting of the laser head to multiple platforms and also provides a safety viewing window for the laser processing. The focus lens of the laser has a fixed focus at ¼" below the shroud. There is a tool provided for this focus setting.

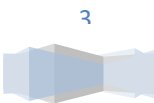
Lifetime of the laser at the recommended factory setting is 5,000 to 10,000 hours depending on the environmental conditions.

### ABSOLUTE MAXIMUM RATINGS:

Item	Absolute Maximum Ratings	Unit
Forward Current (Tc = 25°C)	3.5	A
Absolute Max Output Power	48	W
Allowable Reverse Current (Tc = 25°C)	85	mA
Lifetime @3 amps	5000-10000	Hours
Lifetime @3.5 amps	1000	Hours
Operating Case Temperature	50	°C

### ELECTRICAL / OPTICAL CHARACTERISTICS

Item	Min	Typ.	Max	Unit
Typical Optical Output Power @3 amps		44	45	W
Typical Optical Output Power @3.5 amps		48	50	W
Typical Operating Current		3		A
Dominant Wavelength	450	455	460	nm
Threshold Current	80		220	mA
Operating Voltage	3.7		5.5	V



Focused Spot Size	.003x0.004	0.003x0.004		Inch
Beam Divergence Full Angle (1/e <sup>2</sup> ) //	5	14	25	deg.
Beam Divergence Full Angle (1/e <sup>2</sup> ) - Perp	30	44	50	deg.

-Above specifications are for reference purposes only and are subject to change. Figures in specifications may contain measurement errors.

## GETTING STARTED

### UNPACKING

Inspect the shipping container for damage. Verify the contents of the package:

- Octo Pro 44W Laser Head
- Focus Tool
- OD4+ Safety Goggles with Case
- 24V 6 amp power supply (may be included with the SI board)

\*Normally the Quad Pro laser will come in the bundle or kit with the safety interface board, power adapter, cables, and mounting kit.

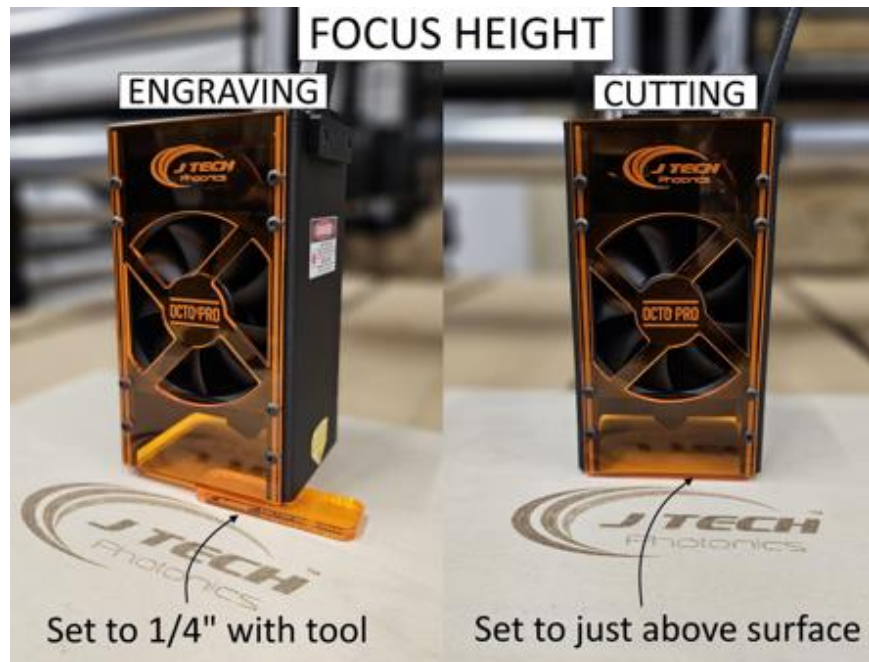


## OPERATION

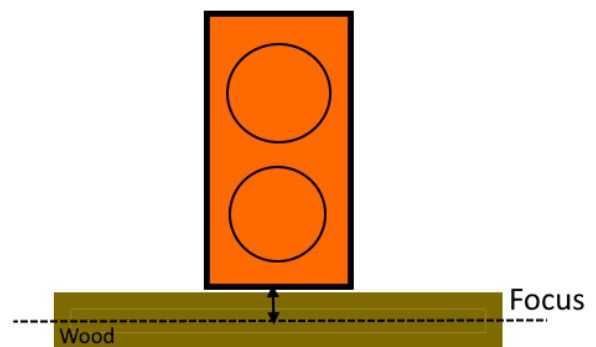
### LASER FOCUS

The laser should be focused depending on what application you are completing. In the case of engraving, the laser should be focused on the top of the wood.

In this case, the laser is fixed focus to  $\frac{1}{4}$ " below the laser shroud. For engraving, you can focus the laser to the top surface of the material using the focusing tool provided.



For cutting, we recommend putting the focus at the middle or the bottom of the material. For example, if you are cutting  $\frac{1}{8}$ " material, then set the focus of the laser at  $\frac{1}{8}$ ". If you are cutting  $\frac{1}{4}$ " material or more, then put the laser almost touching the material to allow for the focus to be at the bottom.



When cutting, set the laser focus to just above the wood to allow the focus to be in the middle or on the bottom of the wood.

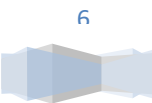
## ADJUSTING FOCUS

The laser focus can be adjusted up about a total of 1" to allow for processing 3D objects. This is not recommended for all projects as the shroud will not be protecting the beam area as much. Moving the laser down will move the shroud up and allow it not to hit 3D objects in the way.

To move the laser down (and the shroud up), loosen the two screws in the back of the laser and then slide the laser to the required height and tighten the screws. To put the laser back, simply loosen the screws again and move the laser up the slide to the top.



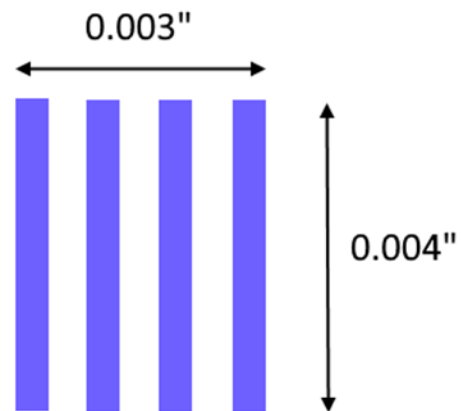
**\*There is no need to adjust the factory focus setting of the laser unless you want to do 3D engravings. It is best to leave it at the factory setting.**



## BEAM PROFILE

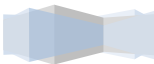
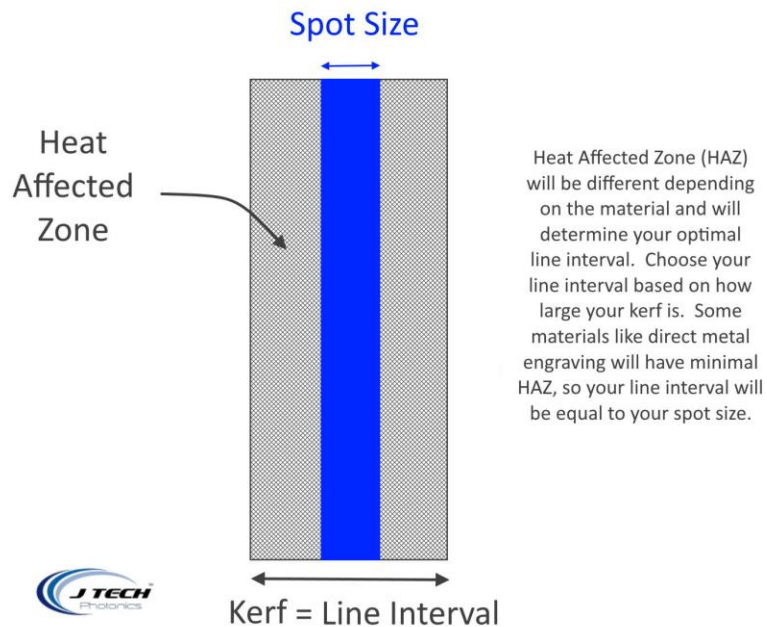
The 44W OCTO Pro laser uses proprietary technology inside the laser to combine eight rectangular beam profiles into one almost square beam profile. This is done by alignment of multiple mirrors inside the laser heatsink perfectly with the lens allowing them to focus to a small spot.

### 44W OCTO PRO Beam Profile (Free Space)



Kerf width (or “line interval” in Lightburn) will be the minimum spot size plus the heat affected zone. This is shown in the following diagram.

Spot size on wood typically is about 0.006” or less. On Acrylic, it is 0.0045”. On tile it is 0.0035”.



## AIR ASSIST

The included air assist nozzle will help to keep smoke out of the lens and improve the cut edge quality when cutting. We recommend always using air with the air assist for a minimum to protect the lens.

Use between 5 PSI to 15 PSI for the air pressure. Common 50W aquarium pumps will have this pressure. The air hose can be connected to the 6mm hose connection on the air assist.

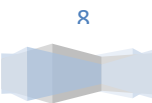
To remove the air assist nozzle to clean the lens, you can remove the one M3 screw on the back of the shroud. Then, slide the air nozzle off the lens cover. Make sure not to pull too hard on the air hose.



## CLEANING THE LENS

We recommend cleaning the lens cover if you do not use the air assist or accidentally do not use the air assist for a project. Debris and smoke can get into the lens cover and the laser will process the glass, causing power loss for the laser. This is especially needed for cutting projects. If your lens is dirty, then it will significantly reduce the power level.

Clean it with a q tip and isopropyl alcohol. Dip the q tip in the alcohol and then twist it on the lens cover. Let dry for 5 minutes before use.





## OUTPUT CONDITIONS

The laser diode output will vary depending on the temperature. Warmer temperature environments will reduce the power of the laser. Do not have the laser in under 0 degrees C. The laser head will also require more current to maintain the same amount of output power as the diodes degrade.

## NORMAL OPERATING CONDITIONS:

The laser diode will operate at its optimal level for thermal performance at the factory setting of 3 amps. Additional current above this level will lead to possible degradation of the laser output and thermal damage if additional precautions for thermal management are not taken. It is possible to reduce the current on the diode to increase the lifetime of the laser. Running at higher current levels reduces the lifetime of the laser.

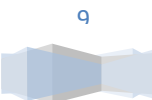
## STATIC PRECAUTIONS

Take precaution when handling the laser head it is a static sensitive device. Static electricity and electrical surges will degrade the performance of the laser diode.

## LASER SAFETY

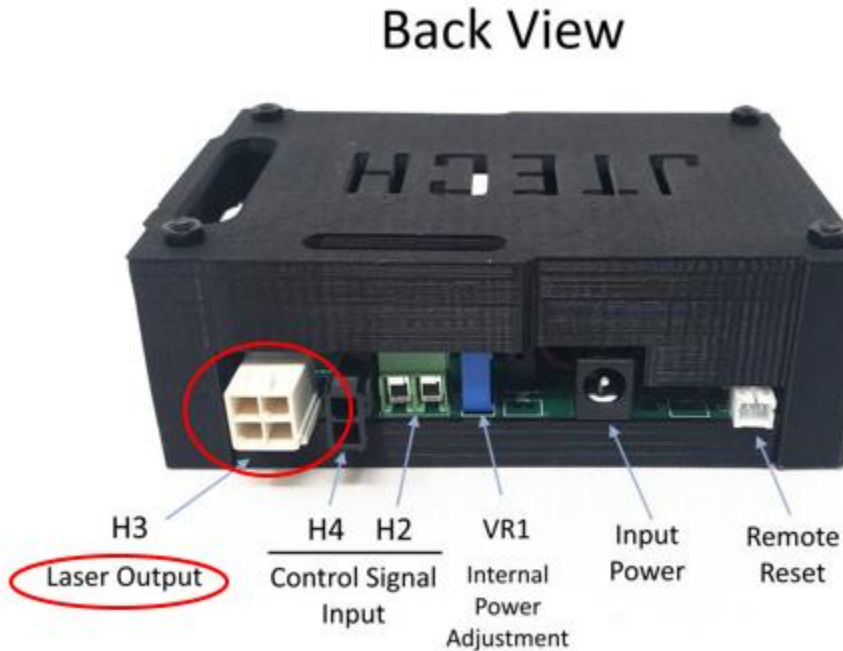


Laser light can cause damage to eyesight and skin if proper laser safety is not used. Always wear the appropriate laser goggles to prevent any laser light, either directly or indirectly to contact the eye. Never expose skin directly to laser radiation. Focused light will increase the safety hazard.



## LASER CONNECTION

The laser will be part of the safety interface board. Connect it to the H3 output port on the safety interface board.



## MOUNTING

The laser has several magnetic mounting kits available. Check the product website under the magnetic mounting kit section to see one for your machine or use the generic magnet mount. The 44W is recommended to use the metal mounting kits.

The magnet mount makes it easy to remove the laser when using the router to carve. Simply disconnect the wires from the gantry connections and remove the laser from the mount. When you want to use the laser, then re-connect the wires and place the laser on the mount.

The laser will have two screws on the back of the laser head. These will fit into the slots on the magnetic mount making the laser fit snugly into the mount. You can also lock it into the mount by tightening the screws once the laser has been attached to the mount.



## ADJUSTING THE LASER ON THE MOUNT

The laser has two screws that can be tightened to hold the laser onto the mount to provide a stronger connection or to permanently attach the laser to the mount. The screws on the back of the laser at M5. Use a ball driver to get the angle to be able to tighten it.



## DISCLAIMER

- All statements of safety are only applied when the laser is used in its intended purpose.
- You are legally responsible for any injury to anybody resulting from the use of or assembly of the laser or their finished products.
- This laser as a COMPONENT for integration in a machine and is not a full laser machine and will be legally responsible from any and all LIABILITIES.

