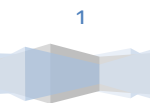


INSTRUCTION MANUAL – 14+ LASER HEAD



Version: 1.3



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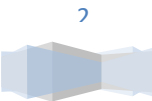
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## GENERAL

### 14W+ LASER HEAD OVERVIEW

The new 14W+ laser head is the optical combination of two 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 equal in both axes.

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

The laser driver is integrated into the laser head unit providing constant current power to the laser diodes. It integrates using the safety interface module for power, signal, and safety features.

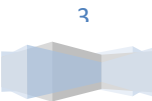
### ABSOLUTE MAXIMUM RATINGS:

Item	Absolute Maximum Ratings	Unit
Absolute Max Output Power	14	W
Allowable Reverse Current (Tc = 25°C)	85	mA
Lifetime (depends on environment)	5000 to 10,000	Hours
Operating Case Temperature	50	°C

### ELECTRICAL / OPTICAL CHARACTERISTICS

Item	Min	Typ.	Max	Unit
Typical Optical Output Power	10	12	14	W
Typical Operating Current		3		A
Dominant Wavelength	435	445	455	nm
Threshold Current	80		220	mA
Operating Voltage	3.7		5.5	V
Focused Spot Size	.0035	0.006		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

If you purchased an “All-in-one” bundle, you would receive a full kit. This Manual will only cover the laser head.

Inspect the shipping container for damage.

Verify the contents of the package:

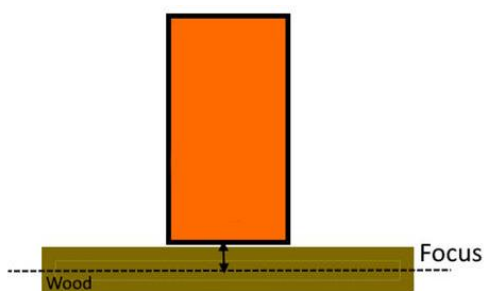
- 14W+ Laser Head
- Focus Tool

### OPERATION

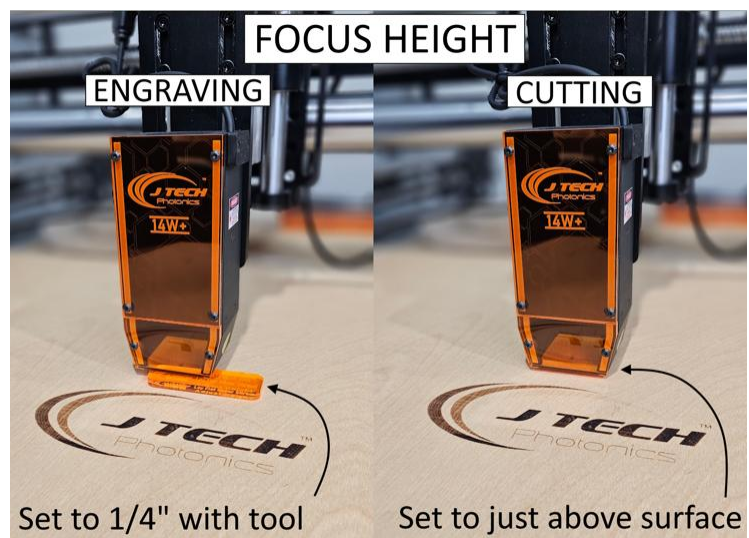
#### LASER FOCUS

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 ¼” below the laser shroud. For engraving, you can focus the laser to the top surface of the material using the focusing tool provided



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.



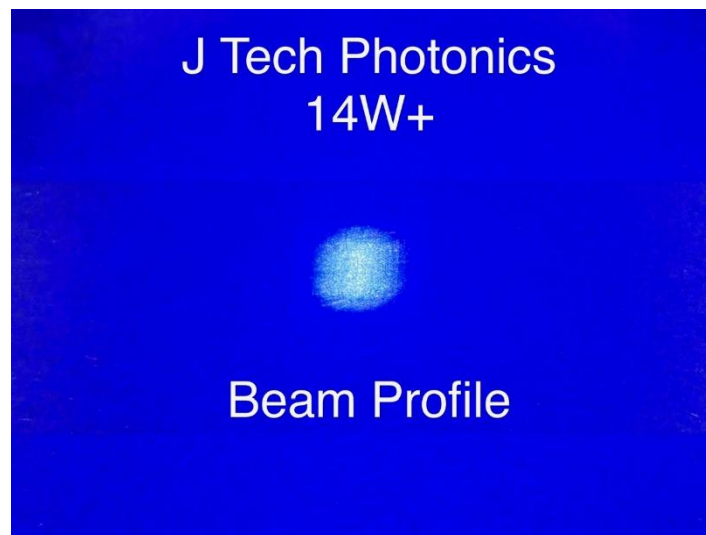
For cutting, we recommend putting the focus at the middle or the bottom of the material. For example, if you are cutting 1/8” material, then set the focus of the laser at 1/8”. If you are cutting ¼” material or more, then put the laser almost touching the material to allow for the focus to be at the bottom.



## BEAM PROFILE

The 14W+ laser uses proprietary technology inside the laser diode package to decrease the total beam size while increasing the total power. This makes it the smallest spot size possible in a diode laser.

A Gaussian beam profile concentrates the highest energy at the center with intensity that smoothly decreases toward the edges, resulting in a natural peak power density at the core and a gradual radial falloff.



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

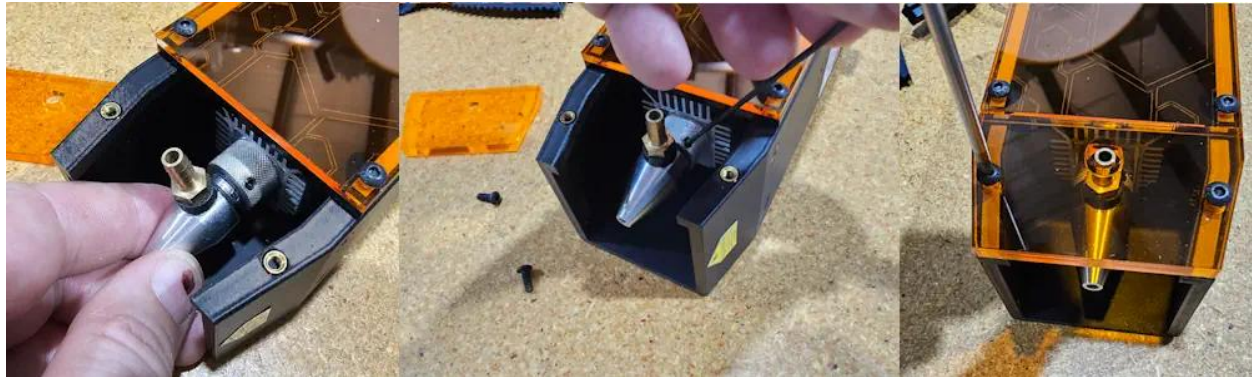
## AIR ASSIST

There is an optional air assist included in your laser package. It is used mostly only when cutting and needs to be attached to an air pump at all times when running as not to damage the lens.

There is a small air nozzle, tool, and new shielding piece.



For installation, remove the old shielding piece and insert the new nozzle over the lens cover. Tighten the set screw and then put the new shielding piece with the hole for the air in the front on using the screws from the original shielding piece. Keep the original shielding piece in a safe place if you want to put it back on for engraving.



## 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 diode will also require more current to maintain the same amount of output power as the diode degrades.

## NORMAL OPERATING CONDITIONS:

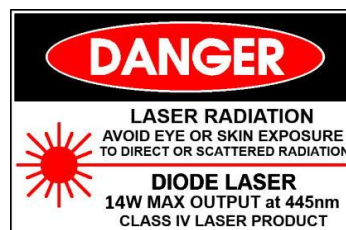
The laser diode will operate at its optimal level for thermal performance at 3 amps. Additional current above this level will lead to possible degradation of the laser output and thermal damage if additional precautions for thermal management are not taken. It is possible to reduce the current on the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

## STATIC PRECAUTIONS

Take precautions when handling laser diodes as they are a static sensitive devices. 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.



## CLEANING THE LENS:

Sometimes soot or smoke can get onto the lens surface when processing, causing decreased levels in output power. This is especially needed for cutting projects. If your lens is dirty, then it will significantly reduce the power level.

To clean it, use a q tip and isopropyl alcohol. Dip the q tip in alcohol and then put it up into the lens holder and give it a twist or two to remove any debris. Take the q tip out and let it dry for 5 minutes before use.

## LASER CONNECTION

If your laser was part of a driver kit, it will be cabled with a Molex mini fit Jr connector which will connect directly to the safety interface board output.

- Connect the laser to the Molex Mini Fit Jr. Header "H3" for laser output 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 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.

## 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.

