



Kern: Introduction

A brief intro to the Kern including a walk around and basic safety

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Introduction

This guide is intended to be a brief overview of the Kern. It takes users through everything on the Kern, the BOFA, and Chiller. By the end of this guide, people should know how to turn the Kern on and troubleshoot basic issues. This does not cover laser settings and setting up prints. Following guides cover those subjects.



TOOLS:

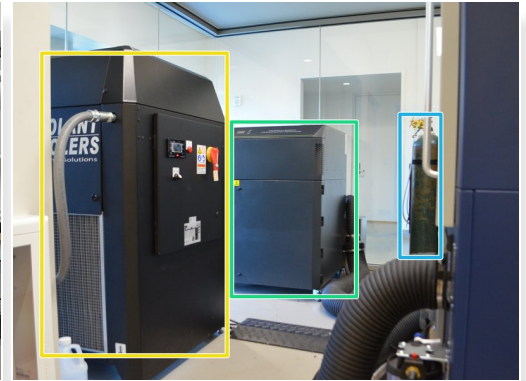
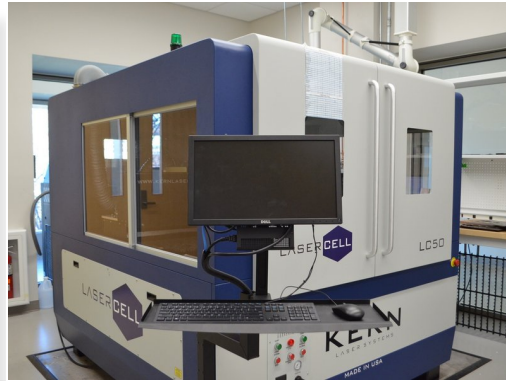
- [Kern Lasercell 400](#) (1)
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Step 1 — Kern vs Other Laser cutters



- Terrapin Works has 3 laser cutters : the Kern, Epilog, and Glowforge
- The Kern is more powerful at 400 watts
 - The Epilog is 75 watts and the glowforge is 35 watts
- The Kern features a much larger cutting area than the other laser cutters at 50" x 52"
- The Kern can cut thicker materials and can cut more quickly than the other laser cutters
- The epilog is quicker at engraving than the Kern
 - ① Some jobs that require more engraving will be better on the epilog than the Kern

Step 2 — Walk Around



- All controls are on the front panel
- Emergency stops are located around the machine
- The computer contains all software required to run the machine
- The Chiller is used to cool the system
- The BOFA is the fume extractor
- Gas bottles are used for different cutting situations
- ① All of the above will have more detailed steps later

Step 3 — PPE



- Proper PPE is always required while using this machine
- Hearing protection is required when running the chiller and the BOFA
- Gloves are occasionally required while handling some materials and while doing some maintenance on the machine (explained in later guides)
- ① Eye protection is not required because the machine is completely enclosed meaning there is no debris or laser beams to worry about

Step 4 — Basic Laser Safety



- Lasers can be dangerous so take care around this machine to prevent injury or damage
- This is a class one laser product meaning it's extremely difficult to injure yourself while using it
- All doors have interlocks to turn off the laser if they are open
 - ⚠️ Never try defeating the safety interlocks
- Emergency stops are located on each corner
 - ⚠️ An operator must be supervising the Kern during any operation

Step 5 — Material Safety



- Materials such as wood and acrylic are flammable, so a fire extinguisher is located next to the machine
 - The Kern cannot cut anything with Chlorine such as PVC because it created Chlorine gas
 - The metal lens must be installed to cut metal
 - The metal lens cannot cut nonmetals
- ⚠ Do not cut aluminum thicker than .060" because it can break the mirrors
- ⚠ If you have any questions about what can or cannot be cut ask an experienced user or send a message in the #equip-kern slack channel

Step 6 — Turning on the Machine



- Press the Green start button
- Turn on the chiller (detailed later)
- Switch the Laser key from off to on
- Turn BOFA on
- All lights should be green when ready to cut

Step 7 — BOFA



- The BOFA is the fume extractor. Simply press the power button to turn it on
- Its default setting is 1000 CFM and it will run as high as possible
- Occasionally it will limit itself well below 1000 CFM and needs to be reset
- Simply press and hold the enter button then press the up button to adjust the CFM
- Press the power button to turn it off

⚠ The BOFA needs to be turned on before using the Kern, it will not automatically turn on

Step 8 — Chiller



- The chiller helps cool the laser and is required to run the Kern
- The Kern will not work if the chiller is off
- It has 3 settings
 - Always on
 - Always off
 - Automatically turn on and off with the Kern

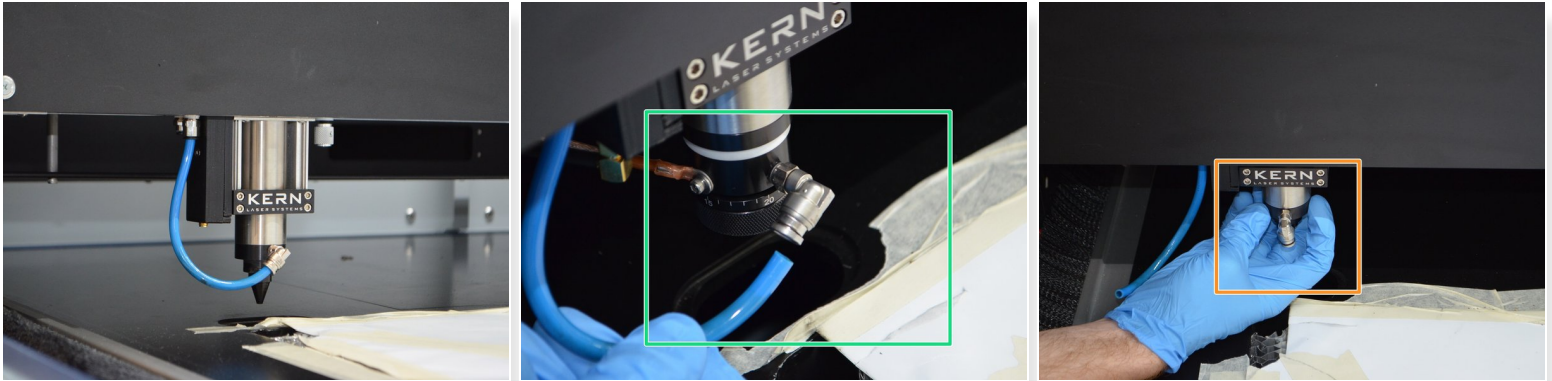
Step 9 — Air Supply



- There are three types of air
 - Shop Air
 - Oxygen
 - Nitrogen
- Air is used on all nonmetals and the dessicant needs to be checked periodically
 - Check the desiccant and make sure it is blue periodically
- Oxygen and Nitrogen are used on metals
- ① Make sure to turn the tanks on or off and purge the air lines when changing gas (explained further in the metal changing guide)

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Step 11 — Changing Lenses and Nozzles



- Changing lenses is as simple as screwing one off and then screwing the new one on
- Unplug the air hose before unscrewing and replug it back in when done
- Tips just screw on the end of the lens
- ❗ The *Basic Operation* guide covers what to do in the software when changing lenses

Step 12 — Turning off



- Press stop on the left side to turn the machine off
- Switch the laser key to the off position
- Turn the computer monitor off

Step 13 — Hitting the Emergency stop



- Press one of the Emergency stops in case of a fire or other emergency
- The Kern will stop and the chiller will eventually turn off

⚠ The BOFA will not turn off

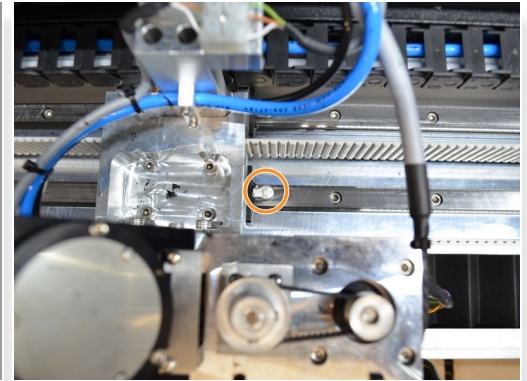
- The reset the emergency stop, twist the stop button to reset the button
- Turn off the Kern then turn it back on and press the servo alarm reset button to reset the system from an emergency stop
- Normal operation should resume after that

Step 14 — Basic Troubleshooting



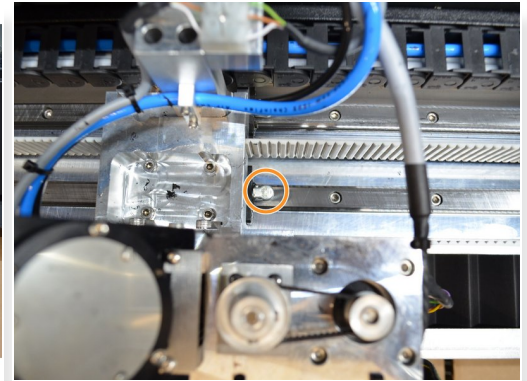
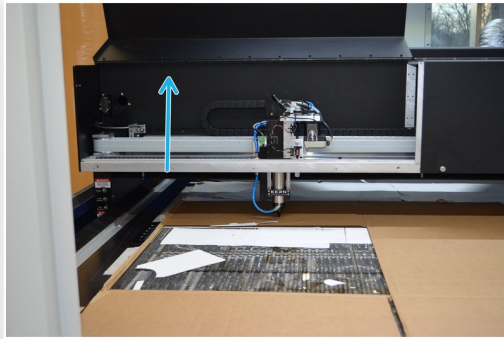
- First place to check is the control panel
- All lights should be green and if any are red, the Kern will not work and will not move
- Each LED has 3 states Red, Orange, and Green
 - Red means not good to go and there is a problem
 - Orange means theres been a status change
 - Green means go
- To update all the LEDs, switch the laser key from on to off then turn back on
- ① In this picture the red indicates the emergency stop has been activated, an interlock is open, there's no water flow, and there's no DC power going to the laser

Step 15 — Basic Maintenance



- Grease all 6 grease ports with a pump and a half of grease from the grease gun once a month
- Check the protective lens in the metal cutting head occasionally (explained in the metal cutting guide)
- The gantry needs to be oiled once a month, simply put some oil in the ring
- Everything else has some maintenance videos online and is completed on an as needed basis
- ① Maintenance videos and other resources can be found on the Kern website:
<http://kernlasers.com/customer-login/>
 - Username: laser
 - Password: system

Step 16 — Getting to the Gantry to oil it



- Start by unscrewing these thumb screws
- Lift the panel up to show the head
- Put oil in the marked spot

Step 17 — Next Steps



- This guide serves as a basic intro to safety and the some basic maintenance and troubleshooting
- The next guide to check out is Corel Draw guide

This Guide serves as a basic intro to the Kern and will provide a walk around the machine, how to complete basic troubleshooting, and do basic maintenance.