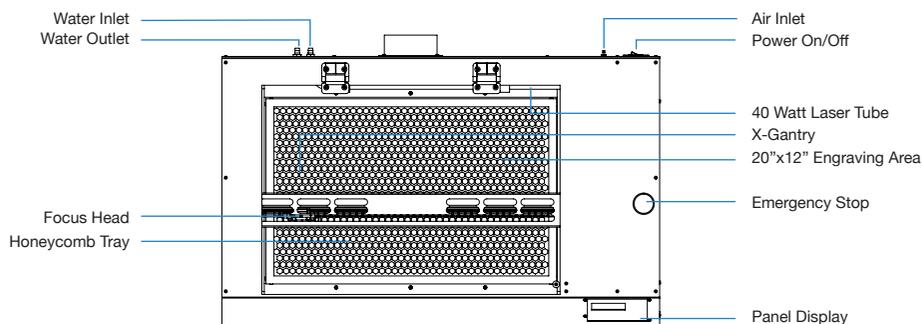


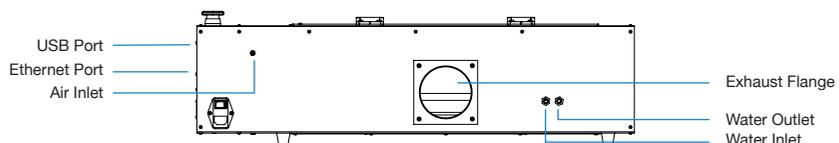
# HOBBY SERIES QUICK START GUIDE

Full Spectrum Laser provides the best customer support in the industry. Contact us if you have any questions or issues with your Hobby Series Laser Cutter. We can also offer convenient purchasing of accessory upgrades and replacement of consumable items. Refer to this sheet for all your customer support and reordering needs.

## Top View



## Back View



## PLEASE CONTACT OUR TEAM



### SUPPORT

M-F 8am to 5pm (PST)  
support@fslaser.com  
702.802.3103



### MANUALS

For a PDF of the Hobby Series user manual go to [fslaser.com/support](https://fslaser.com/support)



### SALES

M-F 8am to 5pm (PST)  
sales@fslaser.com  
702.802.3101



### SOFTWARE

Install RetinaEngrave software by typing "<https://fslaser.com/RetinaEngrave>" into your browser and follow instructions.

## ORDER ACCESSORIES & UPGRADES



### LASER TUBES:

40W,45W Laser Tube.

### FOCUS LENSES:

1.5" Lens, 2" Lens, 2.5" Lens, 5" Lens.

### ROTARY/RISER ATTACHMENTS:

Friction Rotary, Riser.

### WATER ASSIST:

Passive Water Chiller, Active Water Chiller.

### AIR ASSIST:

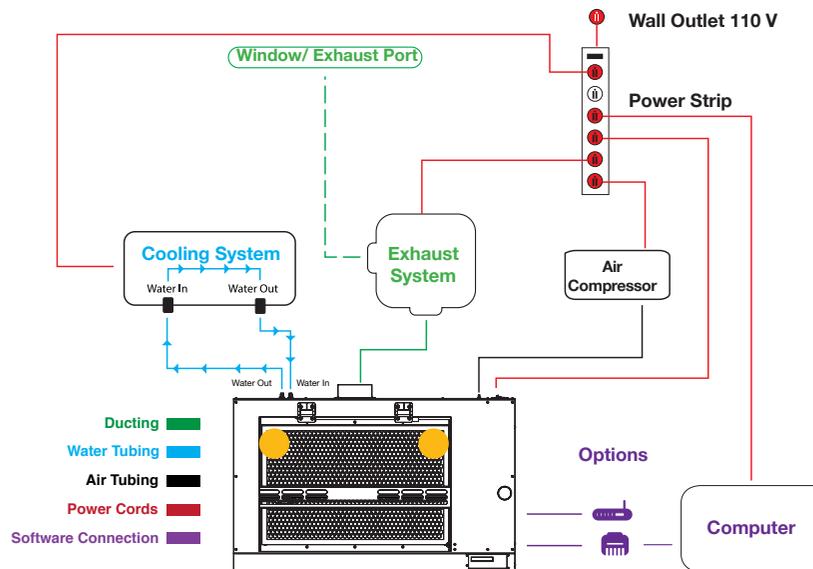
Air Compressor, Exhaust Fan, Large Exhaust Fan.

### EXTRACTORS & FILTERS:

Large, Medium & Small Fume Extractors.  
Large, Medium & Small Filter Replacements.

# QUICK START HOBBY SERIES ASSEMBLY

Your Hobby Series laser cutter will require some minor assembly of the accessory systems, such as the water system. This process should take less than an hour to complete. Your Hobby Series User Manual has complete assembly instructions.



### A. LOCATE AND CUT YELLOW ZIP TIES

- Cut and remove the yellow zip ties that secures the laser head to the back of the machine.

### B. ASSEMBLE THE WATER SYSTEM

- If using a water chiller, attach the inlet and outlet water tubing as shown in the diagram. Add distilled water as instructed.

1. If using a water pump/bucket system, remove the water pump from its packaging and gently screw on the plastic fitting.

2. Push one end of one of the two (2) silicone water tubes onto the water pump fitting. Now attach the other end of that tubing to the "water inlet" located at the back of machine. Completely submerge the assembled water pump in the bucket of distilled water.

3. Fill a clean 5 gallon bucket (not included) with 3 - 4 gallons of distilled water. It is best to use a bucket with a lid and cut two holes to secure the water tubing. This will prevent debris from contaminating the water.

4. Push one end of the other silicone water tubing onto the "water outlet". Place the other end of the water tubing into bucket of distilled water.

### C. ASSEMBLE THE AIR COMPRESSOR

1. Remove the air compressor from its packaging. Gently attach on the push fitting to the air compressor.

2. Push one end of the black air inlet hose over the air compressor push fitting until it is snug.

3. Insert the other end of the black air inlet hose into the "air inlet" nozzle in the back of laser cutter via the barbed air connect fitting.

### D. CONNECT THE EXHAUST SYSTEM

1. Position ducting on exhaust port and secure with 4" ducting clamp.

2. Attach other end of ducting to flange side of exhaust fan, then the second ducting to the exit port of the exhaust fan.

3. Ventilate the ducting outside through a window or exhaust port.

- If using a fume extractor, you can attach the ducting directly to the fume extractor, and bypass the exhaust fan completely.

### E. CONNECT POWER

1. The power cord plugs into a "C14" power receptacle located at the right-rear side of the machine.

2. Follow the diagram and connect all power connections to a central power bank and then plug the power strip into an appropriate wall outlet.

### F. CONNECT THE ETHERNET CABLE

1. Locate and remove the included Ethernet cable from its packaging.

2. Plug in the Ethernet cable into the Ethernet slot on the right side of the machine.

3. Plug the other end of the Ethernet cable into your computer's Ethernet slot.

4. Connect Via Router (Recommended): Router connectivity is more reliable than directly connecting via Ethernet and should be the primary way of connecting. You can also connect via Wi-Fi.

## SAFETY GUIDELINES

**NEVER** leave your machine unattended while it is operating.

**ALWAYS** use the air assist and the exhaust system when operating the machine. Failure to do so can increase the fire risk and cause damage to the machine's parts, particularly the focus lens.

**BE AWARE** that removal of any portion of the cabinet will expose a Class 4 laser system and greatly increase the risk of injury and/or fire.

**KEEP** the area around the machine clean and free of clutter, combustible materials, explosives, or volatile solvents such as acetone, alcohol or gasoline.

**IN CASE OF EMERGENCY** power can be instantly cut off by pushing the Emergency Stop (the large red button) located on the top of the machine.



### FIRE SAFETY

**KEEP YOUR LASER SYSTEM CLEAN** – A build-up of cutting and engraving residue and debris is dangerous and can create a fire hazard. Keep your laser system clean and free of debris. Regularly remove the cutting grid to clean any small pieces that have gotten stuck or fallen through.

**ALWAYS** keep a properly maintained and inspected 5lbs. or larger fire extinguisher on hand. Full Spectrum Laser recommends a CO2 fire extinguisher.



### LASER SAFETY

**NEVER** engrave or cut any material containing PVC or vinyl as corrosive gases will occur that can cause harm to the operator, as well as damage the machine and void the warranty. Never engrave or cut any unknown material.

**DO NOT** look into the beam of the Alignment Laser (visible red diode laser).

**DO NOT** run laser with lid open. Always be sure the lid is closed and never tamper with lid safety mechanism.

**NEVER** operate the machine without a properly operating ventilation system. Most materials produce an irritating smoke when engraved. Some materials, including but not limited to paint, varnish, composition board and plastics, produce compounds that can be harmful if concentrated.



### ELECTRICAL SAFETY

**POWER ON/OFF** is controlled by the switch at the back of the machine. To power the machine on, press the (-) side down. To turn power off, press the "o" side down. You can use this switch should you ever need to cut power immediately.

**DO NOT** make or break any electrical connections to the system while the unit is turned on.

**DO NOT** access or tamper with any electronics unless specifically directed to by support, as electronics have high voltage components.

## INSTALL RETINAENGRAVE

### System Requirements:

Windows Vista and higher, Minimum 2GB Ram, Dual Core Processor

**1. Go to Download:** Page: Turn on your computer or laptop, now connected to your laser cutter via the Ethernet cable, or a router. In your favorite browser (Google Chrome is recommended) go to <http://fslaser.com/RetinaEngrave>.

**2. Download Installer:** You will need to download the RetinaEngrave installer first. Click Download for Windows and begin the process, following all on screen instructions.

**3. Run Installer:** Once the installer is downloaded, click Run. Approve any security warnings – the software will not harm your computer.

**4. Run Setup:** You will be welcomed by the Setup Wizard. Click Next and follow the instructions.

**5. Open Software:** Once the download process is complete, you are ready to launch the program through your start menu or by clicking the desktop shortcut.



**ATTENTION!** The machine must be powered on when operating the software or when connecting the laser via the Ethernet cable.

## WORKFLOW CHECKLIST

This checklist presents a "best practice" for each time you run a project. Refer to this checklist often until you are comfortable operating your Hobby Series.

**1. Safety First:** Ensure workspace is free of fire, electrical and other safety hazards. Be aware of all safety issues when cutting materials with a laser. Always have a fire extinguisher on hand.

**2. Power on the laser and all of its components.**

**3. Ensure that:**

- The laser is powered and the boot up cycle begins on the screen.

- The cooling system is connected properly and water is flowing through the tube.

- The air compressor is powered and exhausting air to the laser head.

- The exhaust system is on and vented into a safe location.

**4. Connect to RetinaEngrave** by clicking the RetinaEngrave icon on your computer desktop. Wait for the software to boot. You now have access to the program.

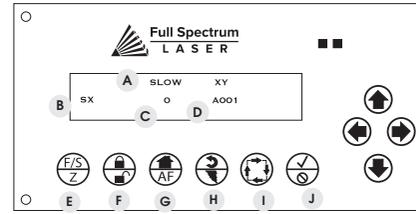
**5. Import your design** and adjust power and speed settings. Double check settings including the number of passes and cut order.

**6. Insert material** into the laser bed. Use the focus tool to adjust to the top of the material. Focusing should be done each time a new material is introduced.

**7. Use the "Perimeter" function** to ensure that the file will fit within the cutting area. Adjust accordingly.

**8. Run the job file.** Do not leave a job running unattended.

## DISPLAY PANEL INTERFACE



### A. Selection Field

Located on the top line, this field gives information on the current operation mode of the laser.

### B. Mode Field

Located on the far left of the lower line, this field tells the operator the current mode.

### C. Power Field

Power Field Displays the laser power. The default setting for all Hobby Series machines is 255.

### D. Address Field

Displays the last 3 digits of the IP address with a character prefix. A prefix of A means that the laser did not find a DHCP server on its network and self-assigned an IP address. The D prefix means the laser found a DHCP server.

### E. FS/Z (MODE SELECT)

Toggles between modes:

- |                    |          |
|--------------------|----------|
| 1. Fast XY Jog     | (Mode 0) |
| 2. Slow XY Jog     | (Mode 1) |
| 3. Alignment       | (Mode 2) |
| 4. USB Jobs        | (Mode 3) |
| 5. Job History     | (Mode 4) |
| 6. Network         | (Mode 5) |
| 7. Software Update | (Mode 6) |
| 8. Support Mode    | (Mode 7) |
| 9. Settings        | (Mode 8) |

### F. LOCK/UNLOCK

Lock/Unlock – Use jog buttons to move gantry when locked or allow manual movement of gantry when unlocked.

### G. HOME / AUTOFOCUS

If in Fast XY (Mode 0) or Slow XY (Mode 1) pressing this button will cause the laser head to seek the home position. When in Fast or Slow Z mode pressing this will autofocus if material is in the work area under the laser head.

### H. RETURN/TEST FIRE

**1.** In Fast XY (Mode 0) or Slow XY (Mode 1) the laser will move to the previously saved job start position.

**2.** In Alignment (Mode 2) this button fires a short-duration pulse designed to mark thermal paper.

### I. RUN PERIMETER

**1.** In Fast XY (Mode 0) the bounding perimeter of the job will be shown quickly (RetinaEngrave software must be started/loaded with a job for this function to be active).

**2.** In Slow XY (Mode 1) the bounding perimeter of the job will be shown slowly.

### J. START/CANCEL

In any menu mode (File Select or Factory Reset) this button will select the option displayed in the SELECTION field.

## MAINTENANCE

### WEEKLY

Use optical grade lens wipes to clean both sides of the beam combiner, all mirror surfaces, the focus lens, and the tube aperture. Optic surfaces may need to be cleaned more often if cutting materials produce excessive residue.

Clean fallen debris from the catch tray of the machine. Less excess material will reduce fire risk, and provide for better exhausting. Always keep rails, motors and moving parts free from excess material as it can obscure movement and cause damage.

### MONTHLY

Check rail lubrication. When the laser arrives, you should be able to visibly see the lubricant on the x and y rails. These rails will not need to be re-lubricated often, but check monthly to be sure that the rails are properly lubricated and aren't grinding or catching.

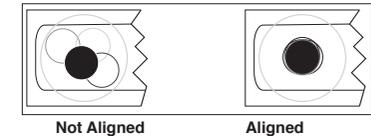
Check your fume extractor filters. Depending on your output and the materials being cut, your fume extractor filters may need to be replaced as often as every month.

### QUARTERLY

Change water in cooling system. This will keep your tube safe from unwanted debris, mold or evaporation. A chiller system is enclosed and will stay relatively clean and undisturbed, but it is good practice to check and change the water as needed.

## MIRROR ALIGNMENT TEST

The CO2 and Alignment Laser beams were matched to follow the same path through the mirrors and fire down the center of the focusing head. Before starting your first job, check to see that the alignment has not been altered by the shipping process.



**1. Open the Safety Lid:** You will need to access the interior of the machine.

**2. Place Thermal Paper:** Take a small piece of thermal paper (approx. 15 mm should be plenty) and place it over the focal lens under Mirror#3.

**3. Position Laser Head:** Move the laser head into the upper left corner of the workspace.

**4. Close Safety Lid:** Safety measures should make it impossible to fire the laser with the safety lid open. Regardless, never attempt to fire the laser with safety lid open.

**5. Test Fire the Laser:** Press the Fire Laser Icon Button on the touch panel.

**6. Repeat Test Fire in Other Three Corners:** Without removing the thermal tape, repeat firing the laser once in each of the other corners of the machine (Upper Right, Lower Right, and Lower Left).

**7. Check Results:** With the fourth corner test fire complete, open the lid and remove the thermal tape. The four burn marks should overlap each other perfectly. If they do not overlap perfectly, you will need to align the mirrors.