

# Muse Titan Assembly

Your Muse Titan will require some minor assembly of the accessory systems. This process should take less than an hour to complete. Refer to the Muse Titan user manual for complete assembly instructions.

## A. Connect the Exhaust System

1. Attach the flange to the exhaust port on the back of the Titan. Secure all ducting with the included 4" clamps.
2. Attach the other end of the ducting to the intake flange on the side of the exhaust fan. Attach the second ducting to the exit port of the exhaust fan.
3. Ventilate the ducting outside through a window or exhaust port

## B. Assemble the Water System

1. Attach one silicone water tube to the INLET port on the chiller, and connect the other end to the OUT port on the back of the Titan.
2. Attach one end of the second water tube to the OUTLET port on the chiller, and connect the other end to the IN port on the back of the Titan
3. Fill the chiller with 2.5 gallons of DISTILLED water.  
(ONLY use distilled water in your Titan)

## C. Assemble the Air Compressor

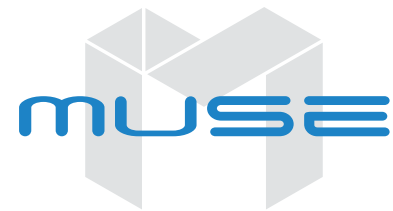
1. Gently screw on the push fitting to the air compressor.
2. Push one end of the air inlet hose into the air compressor fitting until it is snug.
3. Insert the other end of the air inlet hose into the AIR INLET nozzle on the back of the Titan until it is snug.
4. Plug the power cord into the top power port on the back of the Titan.

## D. Connect Power

1. The power cord plugs into a C14 power receptacle located on the back of the Titan.
2. Follow the diagram and connect all remaining power connections to a central power bank, then plug the power strip into an appropriate wall outlet.

## E. Connect Ethernet Cable

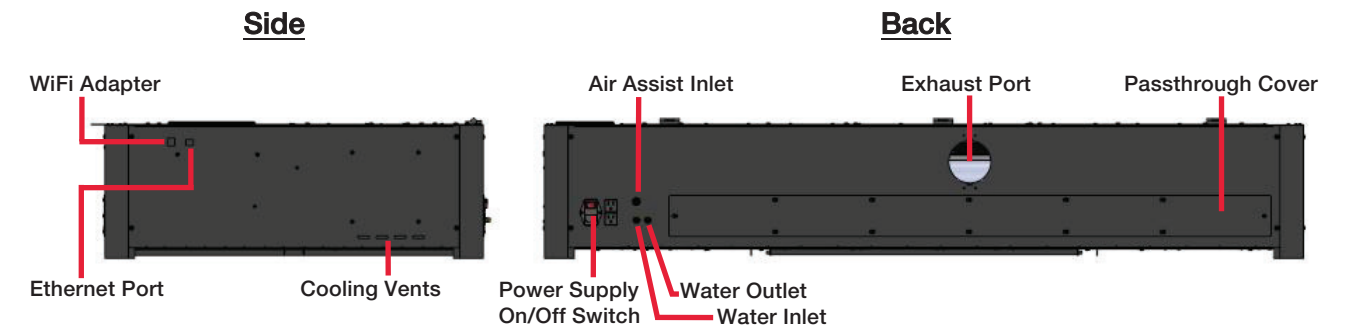
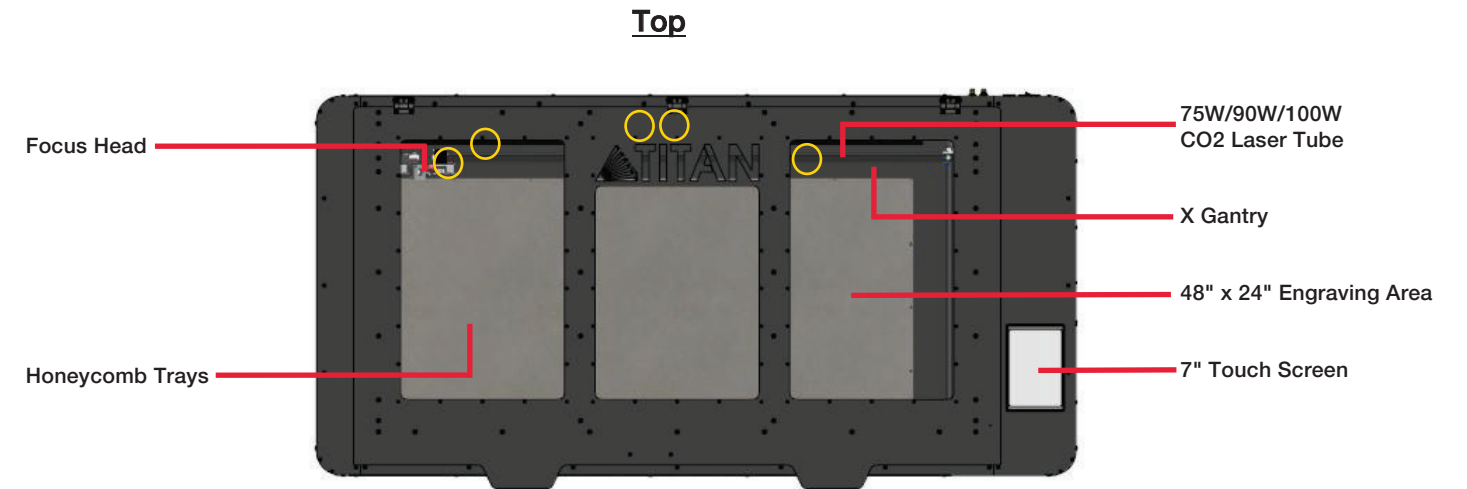
1. Plug in the Ethernet cable into the Ethernet slot on the side of the Titan near the LCD screen.
2. Direct Connection: Plug the other end of the Ethernet cable directly into your computer's Ethernet port.  
Network Connection (Recommended): Connect the other end of the Ethernet cable into your local network (Router, switch, wall, etc). Router connectivity is more reliable than directly connecting via Ethernet, and should be the primary way of connecting if possible.



# Quick-Start Guide

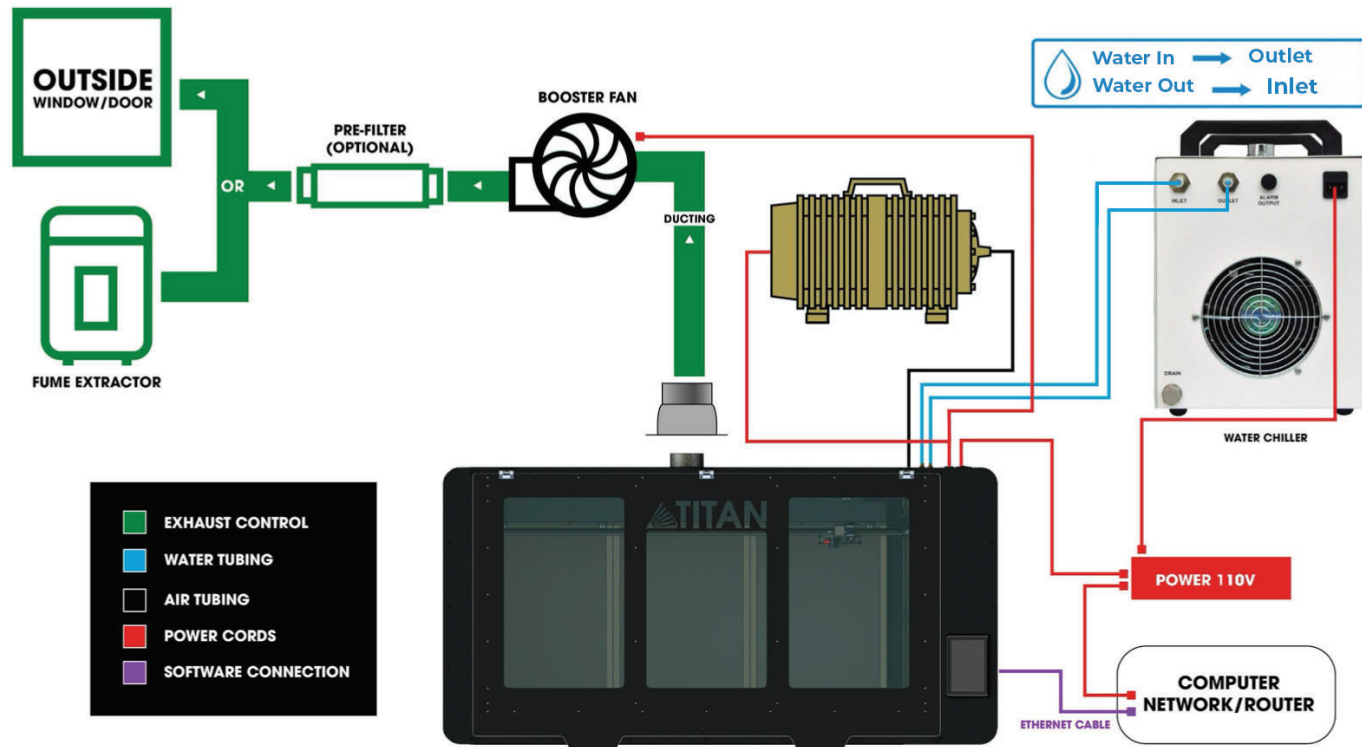
Full Spectrum Laser provides the best customer support in the industry. Contact us if you have any questions or issues with your Laser Cutter. We can also offer convenient purchasing of accessory upgrades and replacement of consumable items. Refer to this sheet for all your customer support and reordering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

**ATTENTION:** Cut all 5 yellow zip ties on gantry before use



## Accessories and Upgrades

<b>Laser Tube</b> 75W, 90W, 100W	<b>Rotary Attachments</b> Friction Rotary	<b>Exhaust</b> 4" Exhaust Fan Particle Pre-Filter	<b>CONTACT SALES TO ORDER</b> 702.802.3101 sales@fslaser.com Mon - Fri, 8AM - 5PM (PST)
<b>Focus Lens</b> 1.5" Lens, 2" Lens 2.5" Lens, 5" Lens	<b>Water Cooling Solutions</b> Radiator Water Chiller Refrigerated Water Chiller	<b>Fume Extraction</b> FSL 100 Fume Extractor FSL 300 Fume Extractor <i>(Fume extractors will require filter replacements)</i>	



Complete user manual available : <http://fslaser.com>

Tutorials also available on YouTube

**Sales**  
Monday-Friday 8am to 5pm (PST)  
sales@fslaser.com  
702.802.3101

**Support**  
Monday-Friday 8am to 5pm (PST)  
support@fslaser.com  
702.802.3103

# Safety Guidelines

The following safety guidelines are meant to highlight the most common safety violations. Use of controls or procedures other than those specified may result in hazardous radiation exposure, fires or electric shock. Please refer to your user manual for a complete listing of safety protocol.



## General Safety

**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.



## 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 recommends a Halotron 1 fire extinguisher or a multi-purpose dry chemical 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** operate the Alignment Laser without the focus lens in place. The unfocused beam can be reflected out of the chassis.

**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. This is your emergency stop 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.

# RetinaEngrave 3.0

There is no download required for RetinaEngrave 3.0. With a local connection (achievable with the included Ethernet cable) your Titan will link with the software's IP address.

**1. Turn On:** Turning on your Titan will automatically boot up your Touch screen interface. Allow 30 seconds or so for the machine and touch screen to boot up.

**2. Go To Settings:** On the Touch screen interface, push the gear icon to go to Settings.

**3. Choose Network:** Push "Network" at the top center of the screen.

**4. Type IP Into Browser:** Type IP into browser: on the touch screen

**NOTE:** Your Titan must be connected to the Internet to receive updates and run the most current version of software. For best results, connect your Titan to your local network router via Ethernet cable. Internet connection is not required to operate your Titan.

# Questions & Answers

## What is the ideal browser to run the software on?

Although any browser will work, we highly recommend using Google Chrome as it is the most compatible with RetinaEngrave 3.0.

## What is the ideal file type to import?

Our software is compatible with a variety of file types. For best results we recommend converting project files to .pdf files before importing. You can also print to .pdf which is particularly useful for Mac users.

## What is the difference between a raster and vector image file?

Vector files are geometric based images such as .pdf file, commonly used for cutting. Raster files are pixel based images, such as jpeg, commonly used for engraving.

## What is the difference between vector cutting and raster engraving?

Vector cutting is a "line" cut that cuts through the material, such as cutting out shapes. Rastering is a pixel-based surface engraving mostly used to create images on materials. Any project can utilize one or both of these methods, depending on the results you are seeking.

## Should I choose threshold or dither?

For images that have shadows and depth (such as photographs), it's ideal to use dithering. Dithering creates a series of dots similar to newsprint. This is effectively creates a grayscale that is ideal for photorealistic engravings. To dither an object select the image, and click the dithering button.

## Why does the image image in the software appear low resolution?

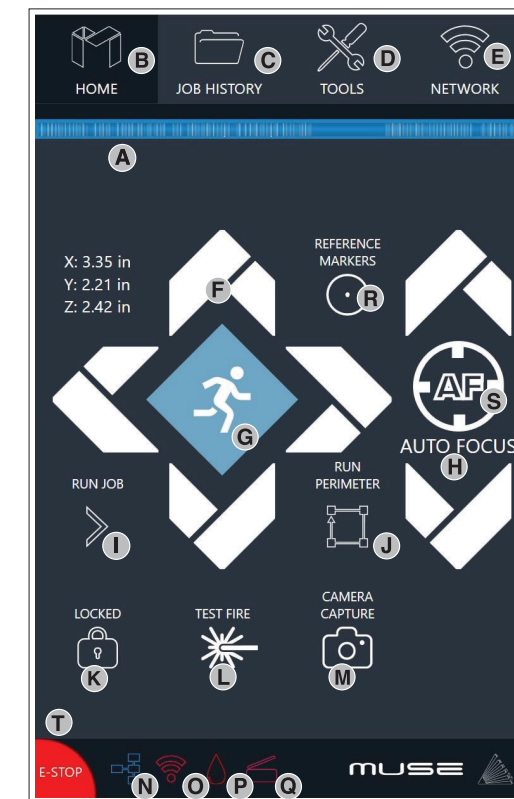
Remember that the on-screen resolution is intentionally lowered for faster processing. The true resolution of your design will be determined in the next step.

## What should my speed and power settings be?

Speed and power setting vary on your machine's laser tube power and your material. It's recommended to run a test on an inconspicuous part of the material before creating your final piece. Keeping a material log is very useful for remembering your individual project settings. In general:  
High Power / Low Speed : Creates deeper engravings or cuts thicker material. Low Power / High Speed : Best for rapid surface level engravings.

# Touch Screen Interface

Muse's touch panel allows you to control the basic functions of your machine without needing to connect to a computer. This is very convenient during alignment and testing procedures. To actually run jobs, you will need to access the RetinaEngrave 3.0 software.



**A IP Address**  
Muse's IP Address. Type this into address bar of web browser

**B Home**  
Returns to the main Home Screen from any sub-screen

**C Job History**  
Accesses Job History sub-screen

**D Tools**  
Accesses About Muse, Update Status, Factory Reset, Device Settings, Camera Calibration, and Home Laser

**E Network**  
WiFi settings, Static IP settings

**F Directional Jog**  
Jog gantry left, right, up or down

**G Jog Speed**  
Switch from Slow jog to fast jog

**H Adjust Autofocus**  
Manually adjust focus height

**I Run Job**  
Start current job in workspace

**J Run Perimeter**  
Laser automatically JOGs the extent of the current project

**K Locked / Unlocked**  
Lock or unlock the gantry for auto or manual homing

**L Test Fire**  
Test fire the laser. Used for mirror alignment and testing,

**M Camera Capture**  
Captures the laser bed.

**N Wired Connection**  
Indicates connection status from the machine to wired network.

**O WIFI Connection**  
Indicates connection status from the machine to wired network.

**P Water Indicator**  
Indicates water system is running properly

**Q Lid Open / Close**  
Indicates lid is opened or closed

**R Reference Marker**  
Used only in absolute mode, this is a way to align objects without the camera

**S Auto Focus**  
Automatically focuses laser to material

**T E-Stop**  
Instantly stop any action. Opening the lid will also stop the laser firing, but not from moving

# Maintenance

To ensure the maximum output for your laser cutter, be aware of periodic maintenance requirements. Before every job, always be sure your water, air and power are operational as well as checking that the machine and workspace are clutter-free. For long term care, relative to use, follow these guidelines:

## 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

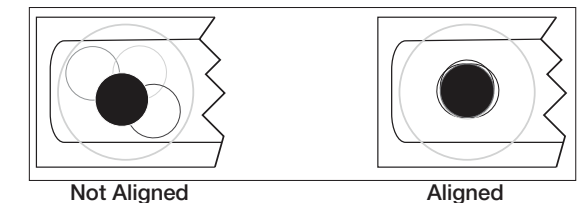
Check rail lubrication. When the laser arrives, you should be able to visibly see the lubricant on the x and y rails. These rails will not need to be re-lubricated often, but check monthly to be sure that the rails are properly lubricated and aren't grinding or catching. Check your fume extractor filters. 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 paper (approx. 20mm) should be plenty and place it over the focal lens under mirror #3
3. Position Laser Head: Move the laser head into the left side of the workspace
4. Close Safety Lid:
5. Test Fire the Laser: Press the Fire Laser Icon Button on the touch screen.
6. Repeat Test Fire in Two Other Positions: Without removing the thermal tape, repeat firing the laser once in the center of the gantry and another on the far right of the gantry.
7. Check Results: With the three position test fire complete, open the lid and remove the thermal tape. The three burn marks should overlap each other perfectly (see illustration). If they do not overlap perfectly, you will need align the mirrors.

