

BOSSLASER

HP **SERIES**
QUICK START GUIDE

V2

BOSSLASER™

Quick Start Guide using Non-Metal & Metal Laser Head Assembly

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Warning

- **Do not** initiate the Auto-Focus / Auto Up & Down function in Normal Mode while the Metal Cutting Laser head is in use.
- **Do not** attempt to Auto-Focus if the laser head is not at its proper location (all the way down; close to the Z+ Limit Switch)
- **Do not** use Follow Mode while working with Non-Metal material on your HP machine.
- **Do not** use compressed oxygen when cutting organic material (non- metal), compressed air only on non-metal materials.
- **Do not** use compressed air when working with metal materials.

If any of these event(s) occur, you will be financially responsible for any damages received to your laser machine. Failing to follow the *warnings listed above has the potential to void your machines warranty.*

Warranty Disclaimer

Thank you for your interest in the products and services of Boss Laser, LLC.

This Limited Warranty applies to the laser machines and parts purchased from Boss Laser, LLC.

This Limited Warranty covers any defects in material or workmanship under normal use during the Warranty Period.

During the Warranty Period, Boss Laser, LLC will repair or replace any products or parts of a that proves to be defective because of improper material or workmanship, under normal use and maintenance; at no charge. ***This does not include labor and/or on-site Technical Support.***

The Warranty Period for laser machine parts purchased from Boss Laser, LLC is one year from the day of arrival; with the exception of consumables. Consumables consist of but are more limited to Lens' & Mirrors, which have a warranty of 30 days from arrival.

A replacement part assumes the remaining warranty of the original part; with the exception of consumables, which are 30 days from arrival.

This Limited Warranty does not cover any problem that is caused by:

- Conditions, malfunctions, or damage not resulting from defects in material or workmanship (ex. modifications done to the machine)

Any modifications without written consent from Technical Support will void your machines warranty.

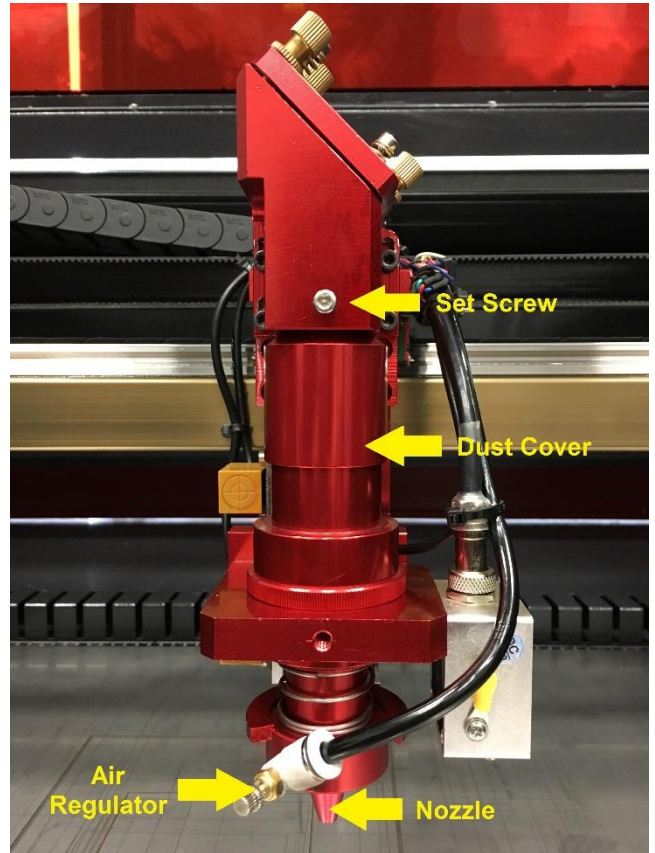
To obtain warranty service, you must first contact Tech. Support (407-878-0880 or TechSupport@bosslaser.com) to determine the problem and the most appropriate solution for you.

Table of Contents

How to Focus the Lens (Non-Metal / Normal Mode).....	1
Using the Auto-Focus Option for Non-Metal Only	1
Running Your First File: "Hello World"	3
Changing Non-Metal Head to Metal Head	7
Cutting Metal Using the Metal Head	11
Metal Head Calibration.....	12
Cutting Your First Metal File.....	14

How to Focus the Lens (Non-Metal / Normal Mode)

Focusing the lens must be re-done every time a new material thickness is placed on the working platform. The laser used highly focused energy to do its job, focusing becomes very important, and fortunately, very easy. **In the picture to the left**, you can see the components associated with correctly focusing the laser head. As you get comfortable in the use of your laser these variables can be experimented with for all kinds of interesting results.

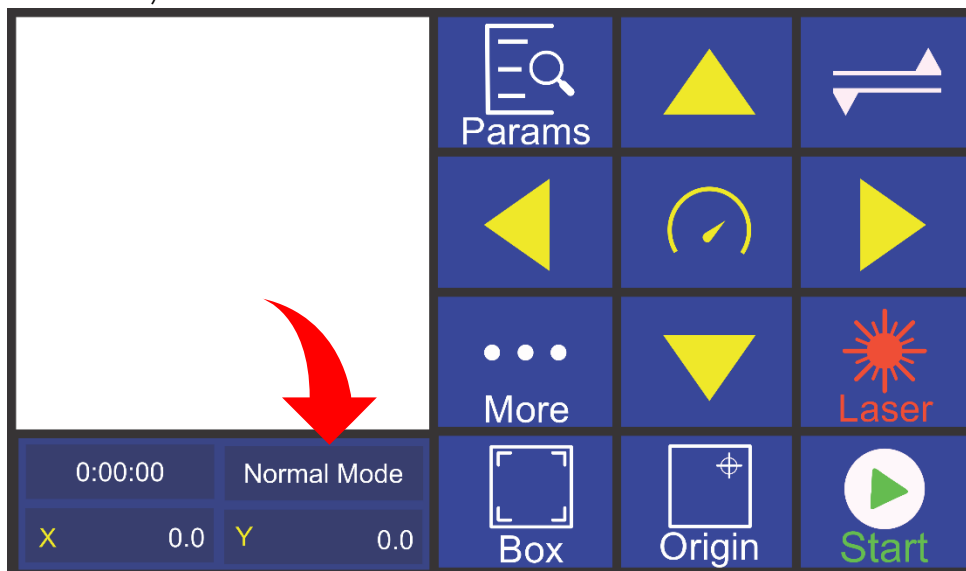


Important:

Always be careful when focusing thick material not to allow material to collide with the lens housing. This can cause serious damage to the laser machine.

Using the Auto-Focus Option for Non-Metal Only

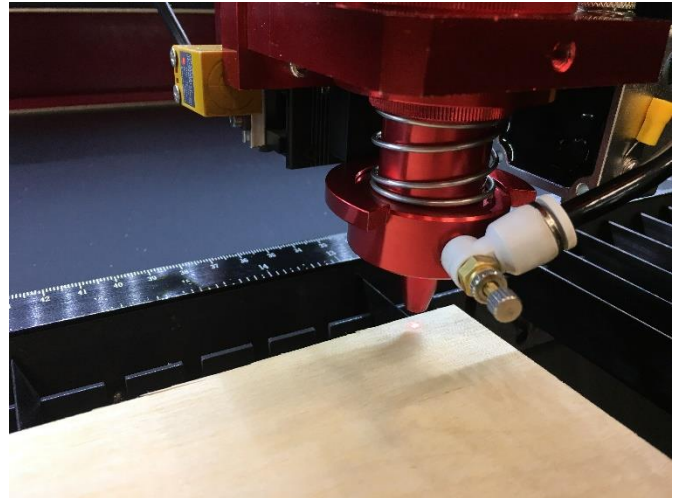
Before continuing this part, make sure you are in Normal Mode. If you are, by any chance, on Follow Mode, you'll need to switch to Normal Mode. To switch to Normal Mode, press onto where the red arrow is pointing (where it says "Normal Mode"). Doing this will allow you to switch between the modes (Normal vs. Follow).



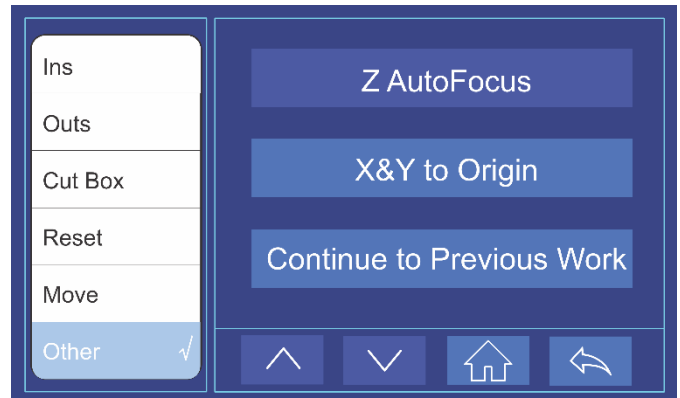
Using the Auto-Focus Option for Non-Metal Only (Continued)

Make sure to have the laser head all the way down, right before triggering the Z+ Limit Switch (red light indicator if touching; if light is on, jog back up slightly till it turns off) before continuing... (Use Z Down button on the Touch Panel to move it down)

Now place your "Non-Metal" material (for this example, we'll use birch wood) below the laser head as shown on the picture.

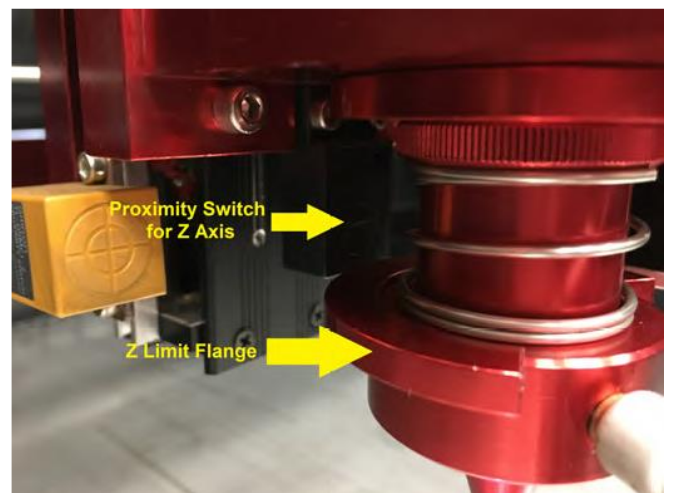


Next, go to More > Other on the Touch Panel to have the menu show up that's illustrated on the picture. If you need to bring the worktable up closer to the nozzle before Autofocusing, use the U-Axis Up/Down Arrow Keys from the main interface.



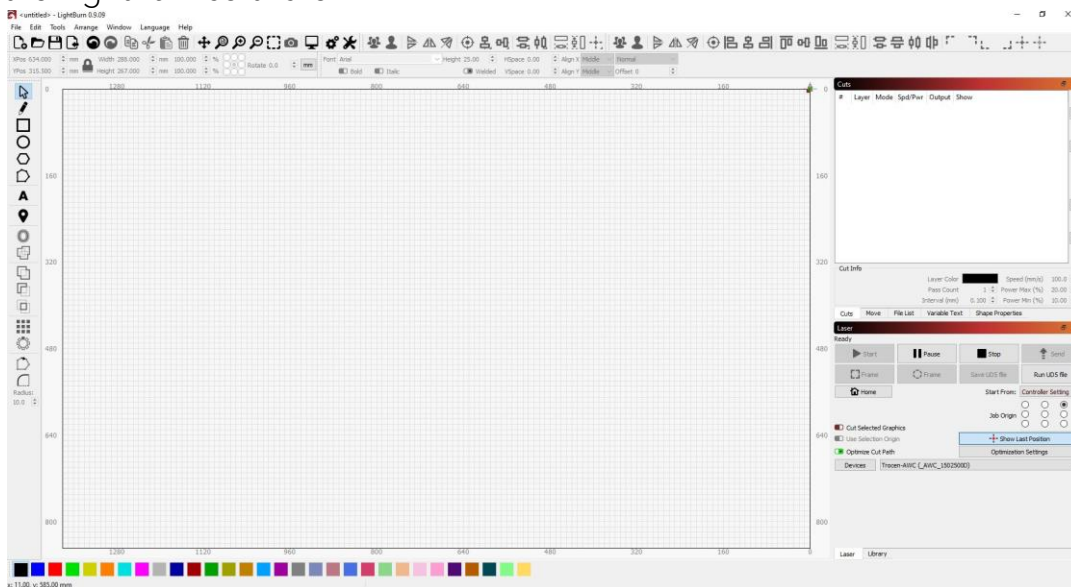
Once you have activated the Z AutoFocus, the worktable will bring the material upwards towards the nozzle of the laser head. The Z Limit Flange will then start to get closer to the proximity switch for the Z-Axis. Once the flange reaches the switch, it will then bounce the worktable back downward at the set Focal Depth.

You should now be focused on your material

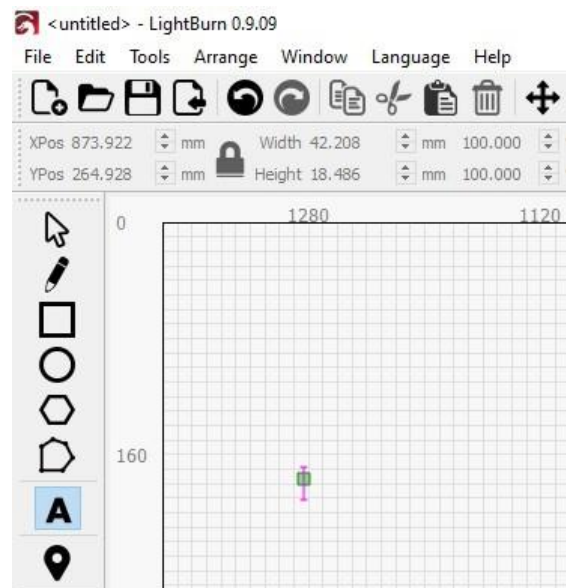
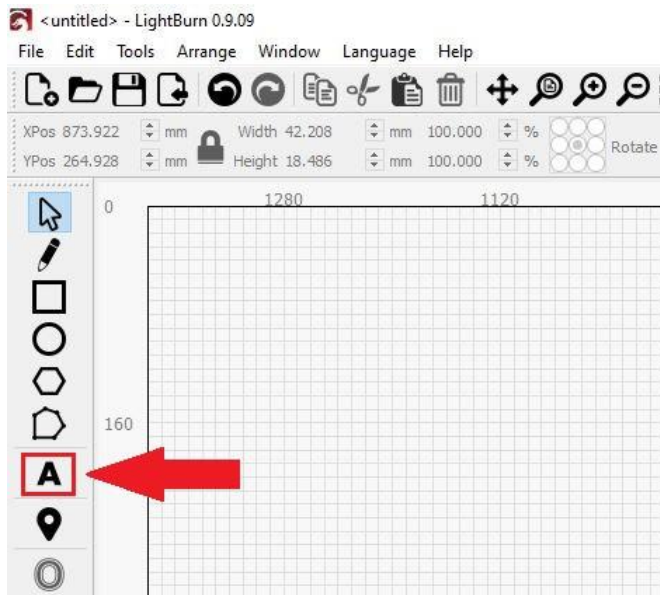


Running Your First File: "Hello World"

Now launch the LightBurn software:



Click on the Text icon indicated by the red arrow w/ the red square around it. Once you have selected **Text**, click anywhere on the grid space and a text cursor will appear (as shown below):

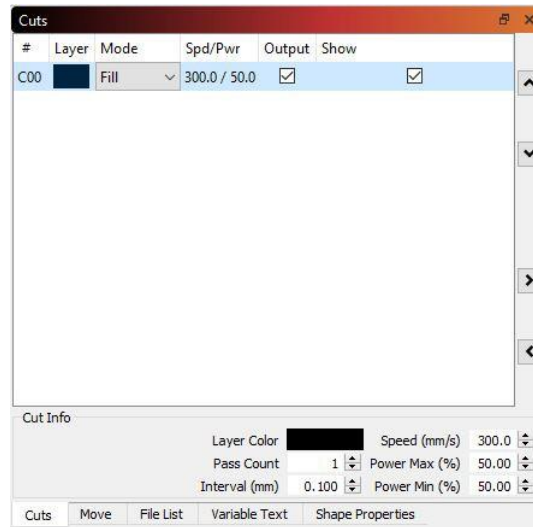


For this exercise, type "Hello World" in the text box.



Running Your First File: "Hello World" (Continued)

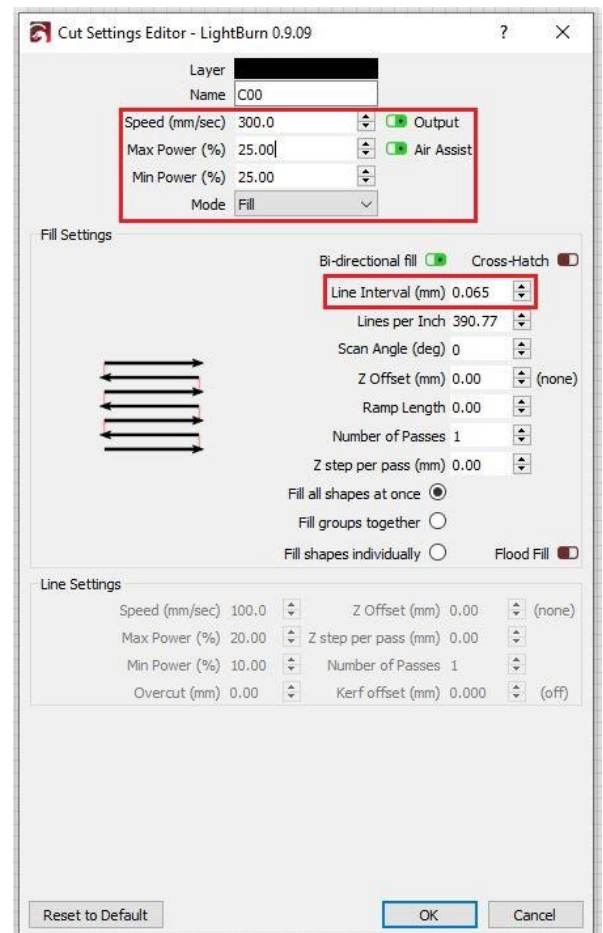
The next step is to set the Speed and Power for the image. Located on the top right side of the LightBurn software, you'll find the Layer Options (as shown to the right).



Double click on the **Layer Color**. The Layer Parameter window, shown below, should appear:

- **Mode:** Make sure this is set to **Fill**
- **Power (%):** For this exercise, we are going to use **25% (for Min. & Max.)**
- **Speed (mm/sec):** Set this to **300**. Maximum Speed is limited to 500.
- **Line Interval (mm):** Set this to **0.065**.
Recommended range = 0.065 - 0.1

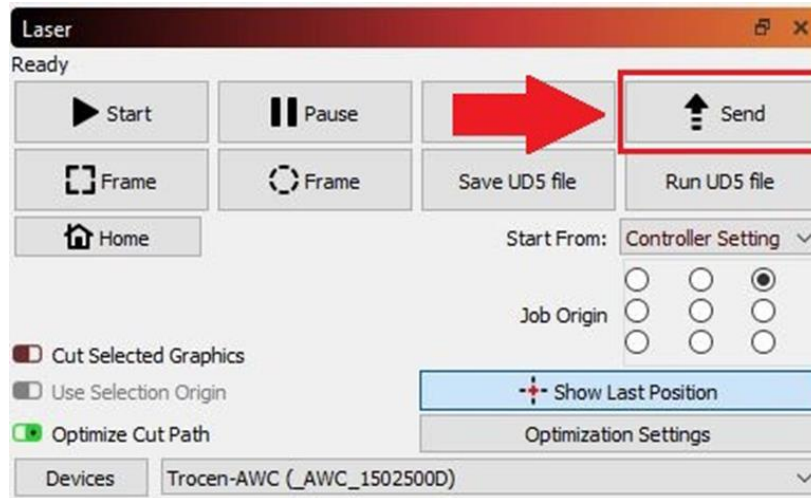
After those changes have been made, click on the **OK** button.



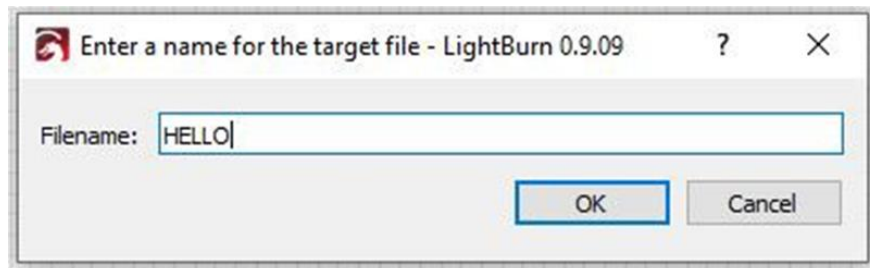
Running Your First File: "Hello World" (Continued)

The next step is to now send this file to the machine. Make sure you have the Black USB Cable connected to the PC from the machine and that the machine is ON.

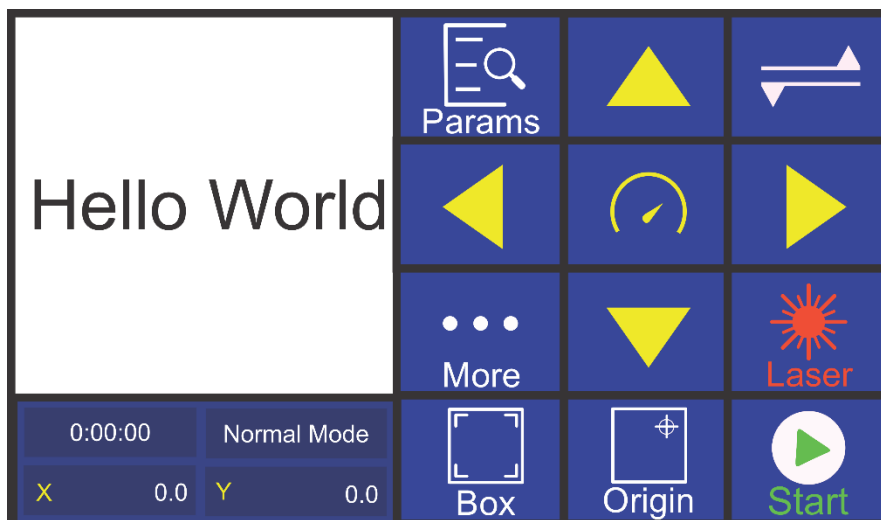
Now locate the Send button which is below the Cuts Window (on the right side of the software):



Once you clicked on the Send button, the window shown below will appear. You can add a name to your file (for this exercise, we named it HELLO). Then click OK to send this file to the machine.

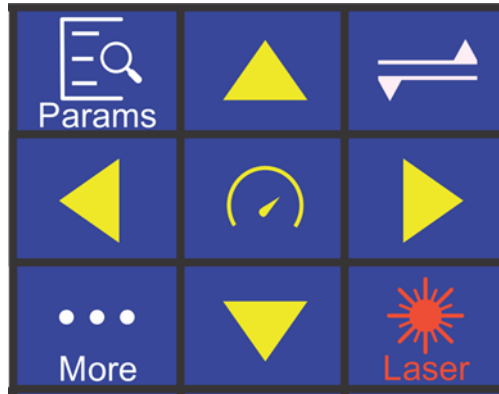


Now if you go to your Touch Panel on your machine, you'll see that the file HELLO has been sent to the machine (as shown below):



Running Your First File: "Hello World" (Continued)

Using the Directional Arrow buttons (shown below), move the laser head above your material, for this exercise, a piece of wood (birch wood).

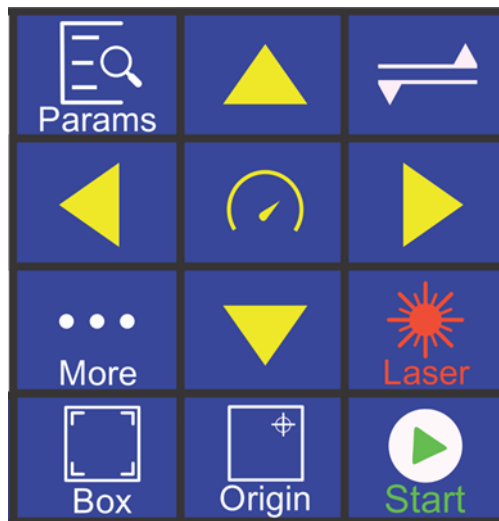


Before you start this job, make sure you Auto-Focus the laser head to your material (refer back to the Auto-Focus Section on how to do this).

Now that you have the laser head Auto-Focused and above your material, position the laser head to be on the top-right of your work area (this area is where you want your image to be). The reason behind being at the top-right is because, by default, the origin point is set to the top right of the image.

Once you have positioned the laser head at the top right, now press the Origin button (shown below) on the Touch Panel. This will set the origin here so when you start your job, it will start from here.

To outline the size of the job (perimeter), press the Box button (shown below). This will move the laser head in a square-like pattern to show you the size of your image. This is a good tool for anyone that needs to re-position their material to match their placement needs.



Running Your First File: "Hello World" (Continued)

Now make sure your water chiller, exhaust blower, and air compressor is on with the machine's lid closed, you can now press the Start/Pause button to run the job.

Once the job is finished running, it should look like the picture shown below:



We HIGHLY recommend you do multiple sessions of using the Non-Metal head until you feel comfortable of the software and the procedures of creating the file and sending it to the machine BEFORE moving into cutting metal using the Metal head.

Changing Non-Metal Head to Metal Head

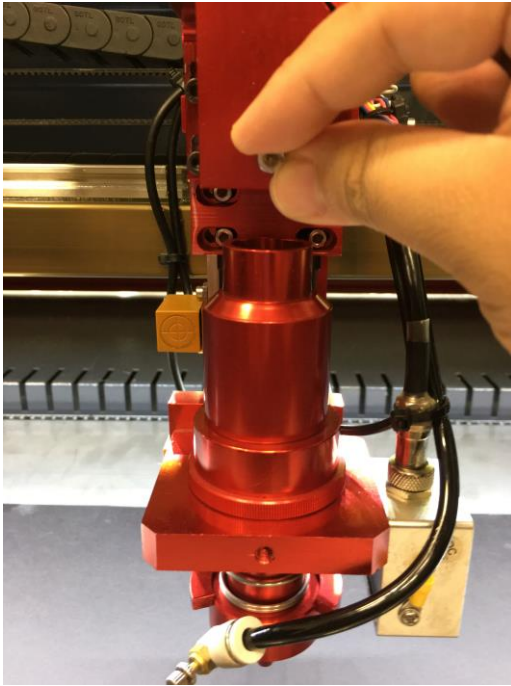


Now before we move into cutting metal with the Metal head, we need to change out the Non- Metal Lens housing & nozzle assembly to the Metal lens housing & nozzle assembly.

First, make sure the Non-Metal laser head assembly is all the way down so we can have enough room to remove the dust cover from the laser head assembly. To move the laser head assembly down, use the Z-Down button on the Touch Panel. The position of the laser head assembly is shown below:

Changing Non-Metal Head to Metal Head (Continued)

Now rotate the set screw to unlock and drop the dust cover out from the laser head assembly (as illustrated below):



As shown below, loosen the retaining nut that is holding the Non-Metal lens housing and remove it from the laser head assembly. You'll need to unhook the 6mm hosing from the nozzle to complete remove the lens housing.



Changing Non-Metal Head to Metal Head (Continued)

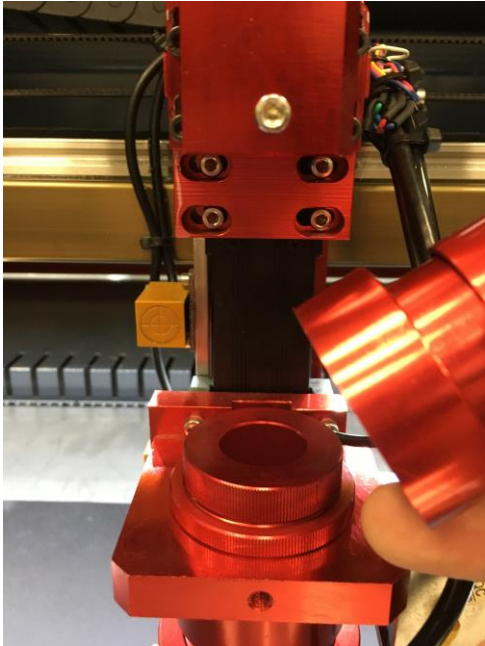
Now installing the Metal head is the same way you would install the Non-Metal head (held by a retaining nut), but you'll need to make sure you install the Blue Signal Cable to the Amplifier (Silver Box). Also, make sure you have installed back the 6mm hosing to the nozzle (as shown below):



For the Metal Head, there is a separate piece for the lens housing (shown above; being held by the hand in the picture)

Changing Non-Metal Head to Metal Head (Continued)

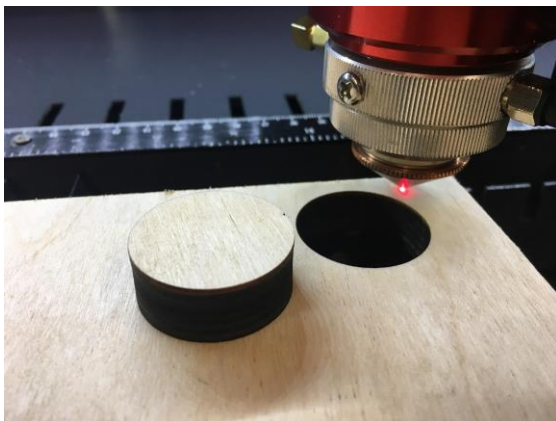
Finally, install the dust cover and tighten it with the set screw shown below:



Technically, you can still use the Metal head to cut Non-Metal material. The main drawback from this is that you do NOT have the Auto-Focus Function available now that the Metal head equipped!

For cutting Non-metal material with the Metal head, you will need to manually find the focal point (finding the smallest spot size by pulsing the laser onto your material).

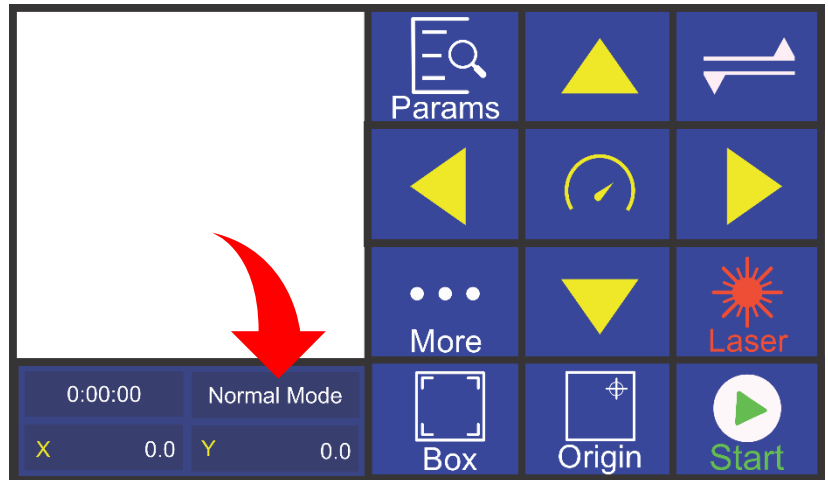
Because the nozzle hole of the Metal head is smaller than the Non-metal head, you'll increase your cutting performance because of the "more concentrated" air flow (as a result shown below, a simple half inch circle cut out):



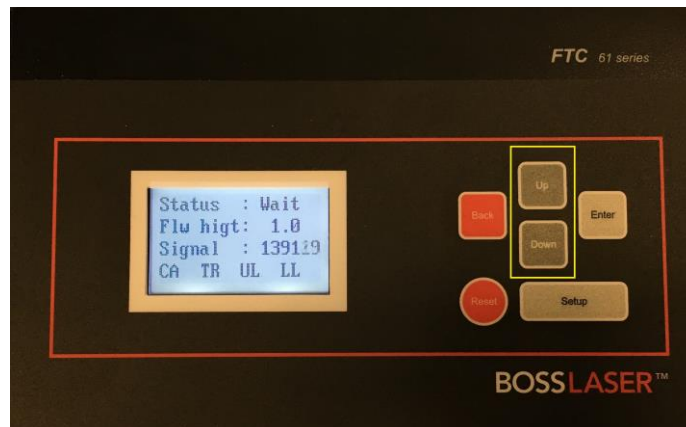
Cutting Metal Using the Metal Head

Now that we have the Metal head installed, there are some preparations and settings to configure before doing your first metal cut out.

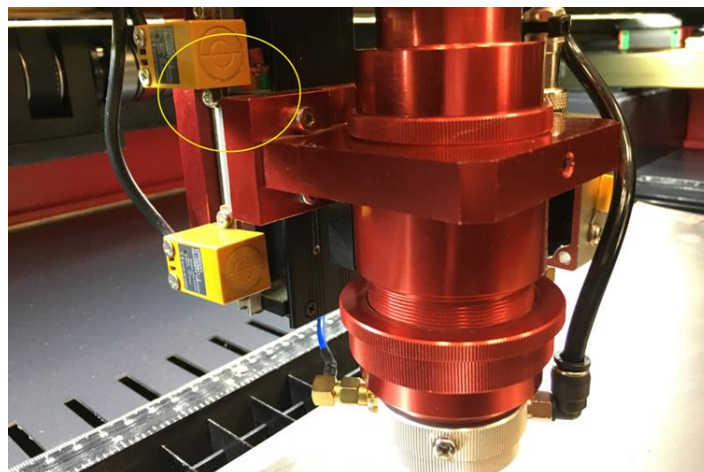
Before continuing this part, make sure you are in Follow Mode. If you are, by any chance, on Normal Mode, you'll need to switch to Follow Mode. To switch to Follow Mode, press onto where the red arrow is pointing (where it says "Normal Mode"). Doing this will allow you to switch between the modes (Normal vs. Follow).



Since you are now in FOLLOW MODE, to move the laser head up or down will be done on the FTC 61 Series Control Panel (as shown below in the yellow box):



You will need to adjust the height of the laser head where top of the red block is right under the Z- Limit Switch (as shown below in the yellow circle):

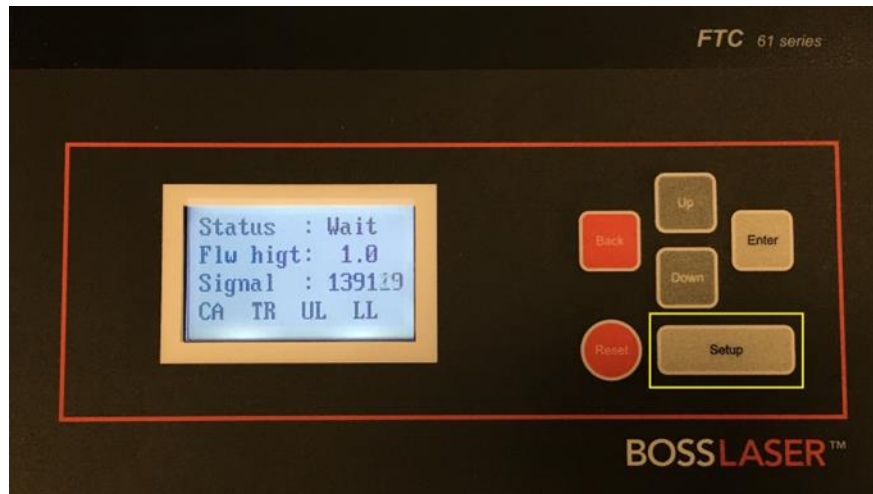


Metal Head Calibration

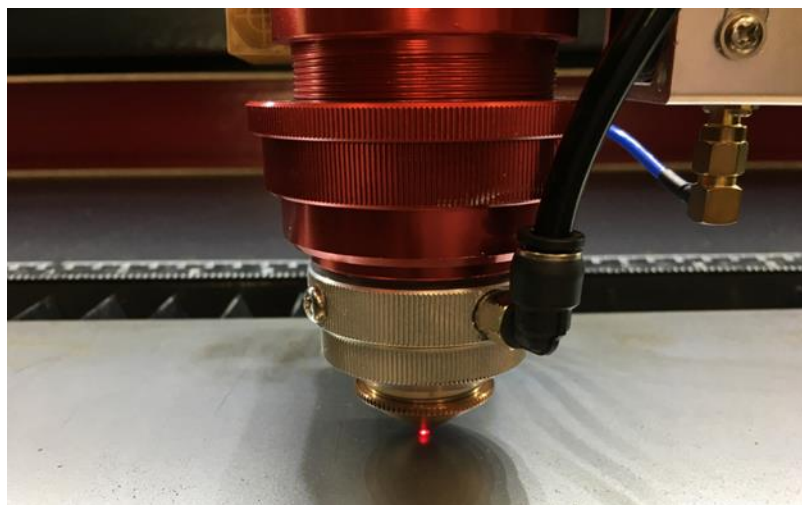
Metal Head Calibration is VERY important and should be done when cutting on any new metal material.

Before continuing, make sure your worktable is about 0.5 - 0.75 inches from the laser head nozzle. To do this, press the Z/U button on the Control Panel, highlight U Axis using the Z Up & Z Down buttons. Once selected, press the right & left arrow keys to move the worktable up or down.

To start the calibration, press the Setup button on the FTC 61 Series Control Panel (as shown below in the yellow box):



Now move the laser head's nozzle by using the Up and Down buttons from the FTC 61 Series Control Panel very close to the material, but not touching (about 5mm gap), as illustrated in the picture showing the metal head w/ the metal sheet.

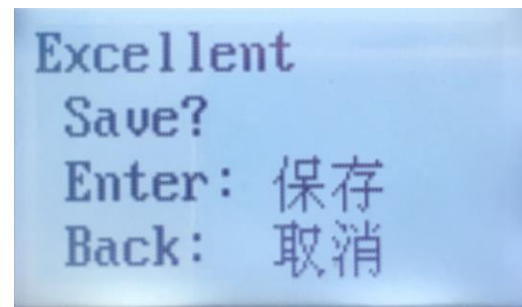
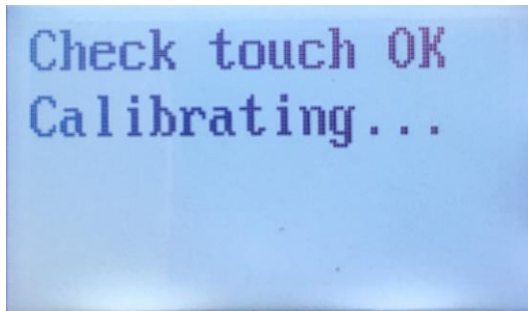


Metal Head Calibration (Continued)

While still in the Settings menu, highlight over the Calibration option, then press the Enter button. This will initiate the Calibration process and you'll notice that the Metal head will move on its own.

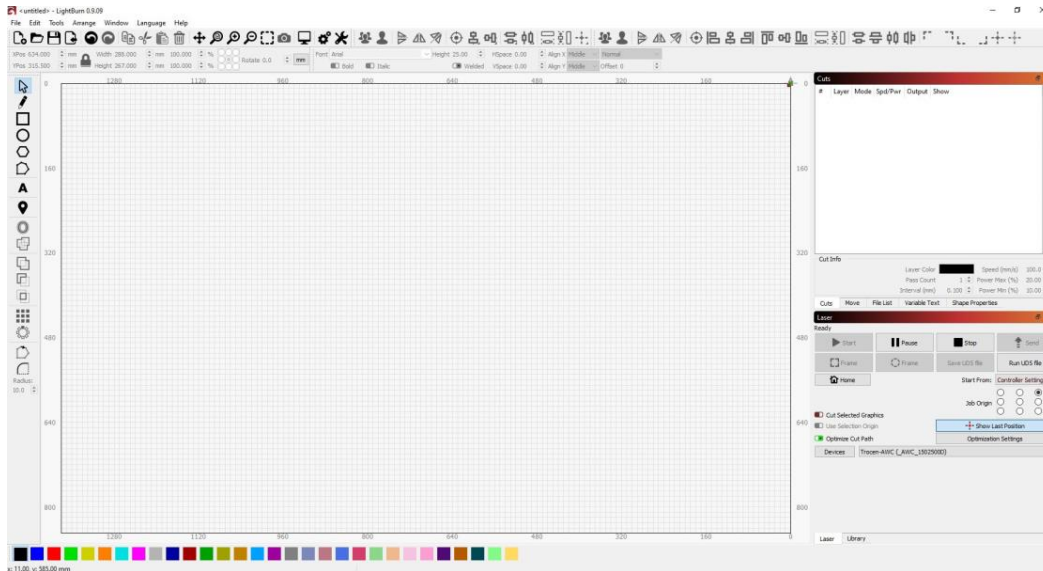


After it has finished, it will "grade" the overall calibration. Then press the Enter button to save the calibration.

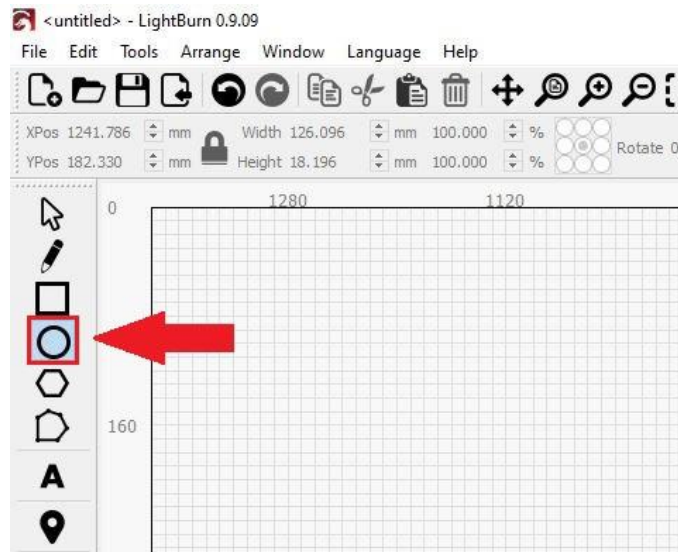


Cutting Your First Metal File

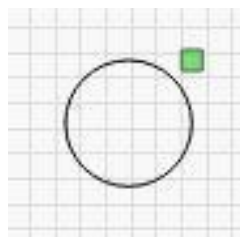
For this exercise, we will cut out a circle through 20-gauge mild steel. So open LightBurn so we can create a circle with some speed/power settings.



Click on the **Circle** icon indicated by the red arrow w/ the red square around it:

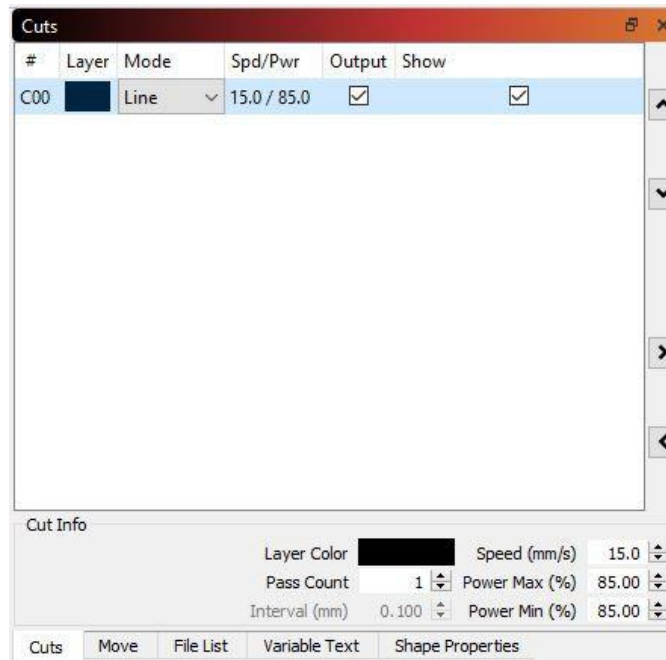


For this exercise, a 50 mm in diameter circle was created (50 mm x 50 mm) as shown below:

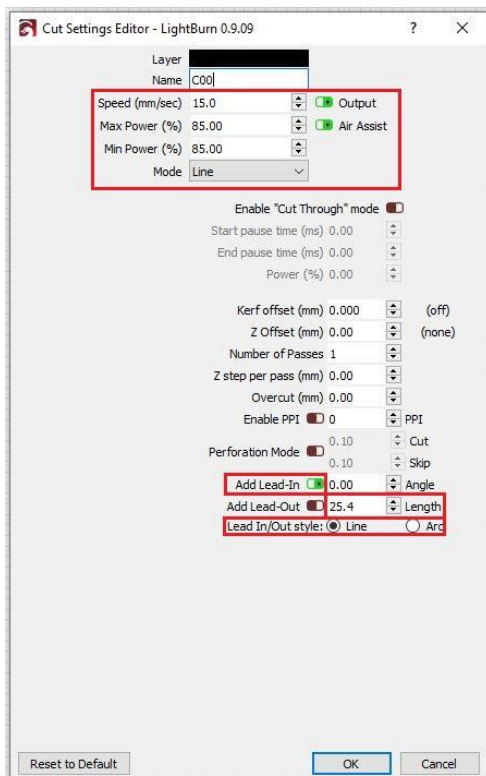


Cutting Your First Metal File (Continued)

The next step is to set the Speed and Power for the cut of the circle. Located on the top right side of the LightBurn software, you'll find the Cuts Window (as shown below):



Double click on the Layer Color. The Layer Parameter window, shown below, should appear:



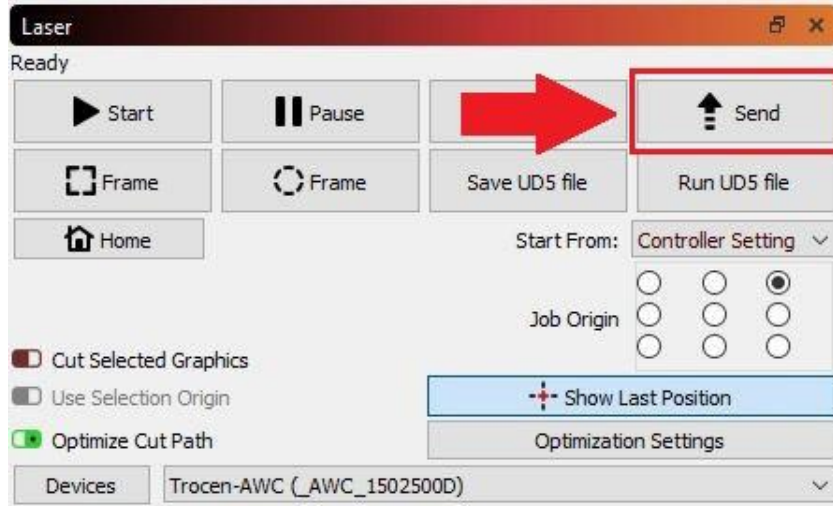
- **Work Mode:** Make sure this is set to **Cut**
- **Power (%):** For this exercise, we are going to use **85% (Min & Max)**
- **Speed (mm/s):** Set this to **15**.
- **Add Lead-In:** Enabled (green = on)
- **Length:** 25.4 mm
- **Lead In/Out Style:** Line or Arc (for this exercise, select Line)

After those changes have been made, click on the **OK** button.

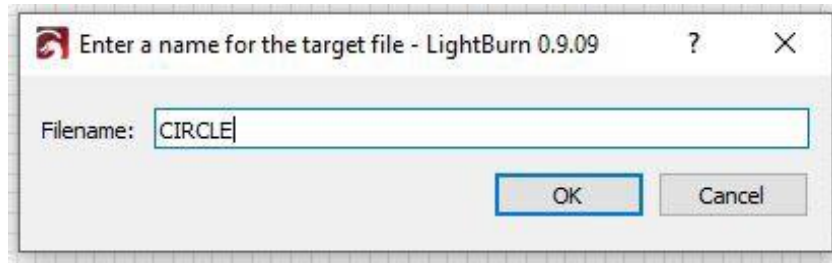
Cutting Your First Metal File (Continued)

The next step is to now send this file to the machine. Make sure you have the Black USB Cable connected to the PC from the machine and that the machine is ON.

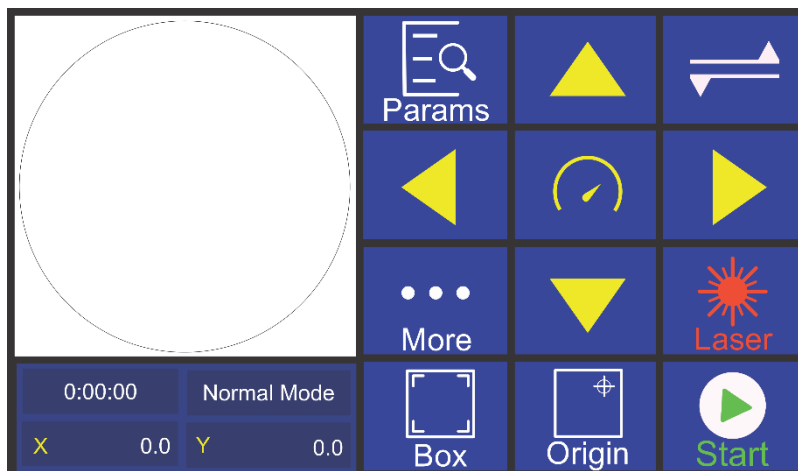
Now locate the Send button which is below the Cuts Window (on the right side of the software):



Once you clicked on the Send button, the window shown below will appear. You can add a name to your file (for this exercise, we named it CIRCLE). Then click OK to send this file to the machine.



Now if you go to your Touch Panel on your machine, you'll see that the file CIRCLE has been sent to the machine (as shown below):



Cutting Your First Metal File (Continued)

Using the Directional Arrow buttons (shown below), move the laser head above your material, for this exercise, a 20-gauge mild steel sheet.

Now that you have the Metal head calibrated and above your material, position the laser head to be on the top-right of your work area (this area is where you want your cut out to be). The reason behind being at the top-right is because, by default, the origin point is set to the top right of the cut out.

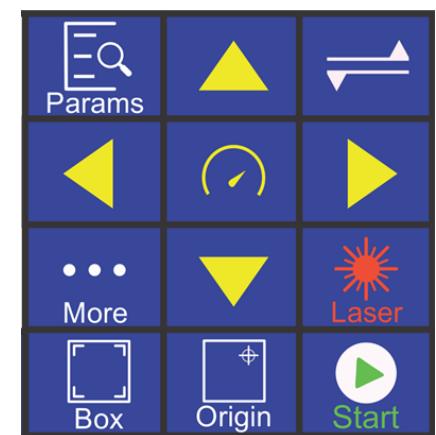
Once you have positioned the laser head at the top right, now press the Origin button (shown below) on the Touch Panel. This will set the origin here so when you start your job, it will start from here.

To outline the size of the job (perimeter), press the Box button (shown below). This will move the laser head in a square-like pattern to show you the size of your image. This is a good tool for anyone that needs to re-position their material to match their placement needs.

Before running your first metal cut, you'll need to make sure you have Oxygen available (standard tank; higher the purity, the better) to help aid your metal cuts. **Do not use compressed air to cut metal.**

Once you have an oxygen tank with an oxygen regulator, you'll need to make sure you get the correct fitting for the regulator that will match the tubing that goes into the back of the machine of the oxygen fitting. The fitting needed will be a Push-to-Connect R-Thread Pneumatic fitting for a 8mm tube. You can call or email Tech. Support at 407-878-0880 or techsupport@bosslaser.com, respectively, to get more information about the fittings themselves.

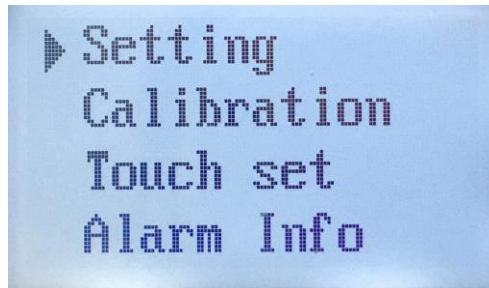
Now make sure your water chiller and exhaust blower are on, the oxygen tank valve open, and with the machine's lid closed, you can now press the Start/Pause button to run the job. Once the job is finished running, it should look like the picture shown below:



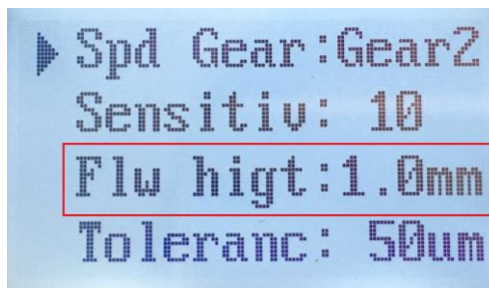
Cutting Your First Metal File (Continued)

Now if you notice any burring at the bottom of your metal piece and you've already tested different PSI levels of oxygen, you may need to change your Follow Height (moving the focal point) to help reduce the amount of burring.

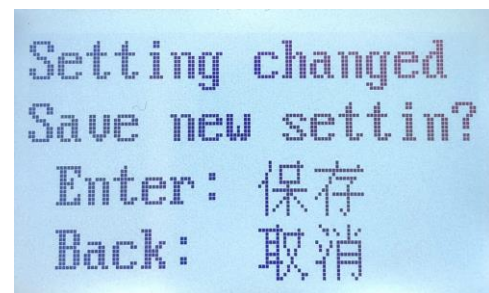
The Follow Height ranges from 1.0mm - 4.0mm. To change the Follow Height, press the Setup button on the FTC 61 Series Control Panel.



Now press the **Down button** twice to highlight the **Flow Height option** (indicated by the red box). Press the **Enter button** here and using the **Up & Down buttons**, you can change the value of your Follow Height.



After making the changes, Press the **Enter button**, then the **Back button**. You be prompted to save the new settings. Press the **Enter button** for YES or the **Back button** for NO.



This now concludes the procedures of running your first file with the Non-Metal & Metal laser head. If there's any further questions/concerns, please contact Technical Support via phone or email at 407-878-0880 or TechSupport@bosslaser.com