

Next Wave *Automation*



Moray Laser OWNERS MANUAL

March 2019

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February 2019

Owner manual updates

This manual will be periodically updated. For the most recent version visit: www.nextwaveautomation.com/downloads-links



Software updates

For Ready2Design – Laser Edition software updates visit:
<http://www.portal.nextwaveautomation.com/>

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To Our Customers

Thank you for purchasing a Moray Laser. Your Moray Laser brings the speed and precision of Laser engraving to your shop in a top value laser system.

This manual provides setup, operation and maintenance information for your Moray Laser.

Please read the manual carefully. This manual also includes our warranty (page 5) and important laser safety information (pages 7-9).

This manual has been written with the assumption that the owner is familiar with the basic operation of a computer as well as the required technical knowledge required for the safe operation of woodworking power tools. Information in this manual is subject to change without notice.

The most recent version is available at
www.nextwaveautomation.com/downloads-links

This manual is also written under the assumption the owner has spent time learning how use Ready 2 Design-LE, which was provided with the purchase of your Moray Laser. Information on setting up and using Ready 2 Design-LE can be found in the printed owners manual that came with the program.

Again, thank you for purchasing the Moray Laser. We are confident you will be pleased with its performance and ability to engrave a wide variety of projects and materials. If you have questions or comments, please contact us at :

Next Wave Automation, LLC
600 W. Boundary St.
Perrysburg, Ohio 43551 USA
NextWaveAutomation.com

For Technical Support please please visit the Support page at our website or email us at: **support@nextwaveautomation.com**
Include your product model number, date of purchase, and any other pertinent information that may be helpful such as .tap files, .r2d files, screen captures, and photos of your setup or problem.

For product sales email us at:
info@nextwaveautomation.com
Main Office Phone – (419) 318-4822

Warranty

Next Wave Automation warrants to the original retail purchaser of a Moray Laser when purchased from an authorized Moray Laser distributor that the Moray Laser and any Moray Laser accessories purchased with the Moray Laser will be free from defects in material and workmanship for ONE YEAR from the date of purchase. This warranty is for parts and labor to correct the defect, and does not cover the cost of shipping the defective item(s) to Next Wave Automation for repair. Warranty coverage requires proof of purchase (copy of sales receipt).

This warranty does not apply to defects arising from normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance. This warranty is void if the Moray Laser or any portion of the Moray Laser is modified without the prior written permission of Next Wave Automation, LLC, or if the Moray Laser is located or has been used outside the country of residence of the Moray Laser distributor from whom the Moray Laser was purchased.

Please contact Next Wave Automation to take advantage of this warranty. If Next Wave Automation determines the Moray Laser or Moray Laser accessory is defective in material or workmanship, and is not due to normal wear and tear, misuse, abuse, negligence, accidents, unauthorized repair or alteration, or lack of maintenance, then Next Wave Automation will, at its expense and upon proof of purchase, send replacement parts to the original retail purchaser necessary to remedy the issue. Next Wave Automation will repair the Moray Laser or Moray Laser accessory provided the necessary Moray Laser component is returned to Next Wave Automation, shipping prepaid, with proof of purchase and within the warranty period.

Next Wave Automation disclaims any and all other express or implied warranties, including fitness for a particular purpose. Next Wave Automation shall not be liable for death, injuries to persons or property, or incidental, consequential, contingent or special damages arising from the use of the Moray Laser.

Record your Moray Laser product information

To locate your machine information, see page 19.

Name: _____

Pendant Version: _____

Controller Version: _____

Serial Number: _____

Model Number: _____

Configuration Word: _____

Bootloader Firmware Version: _____

TECHNICAL SUPPORT

Next Wave is committed to helping you get your Moray Laser up and running as quickly as possible. If you experience any difficulties please contact our technical support team:

On the web at: <https://www.nextwaveautomation.com/support>

By email at: support@nextwaveautomation.com

By phone at: (419)491-4520 during Mon-Fri 9AM-5PM Eastern time zone



1.1 – Eye protection required

When operating the Moray Laser you should always wear the red protective glasses supplied with the unit. The laser should be operated with extreme caution to prevent eye or skin exposure to direct laser light.

DO NOT laser engrave or cut PVC plastic with your Moray Laser. The burning PVC will emit toxic chlorine gas fumes. These fumes also combine with moisture in the air to create hydrochloric acid which will harm you and your machine.

All lasers will emit smoke as they burn the material. We highly recommend using some type of smoke removal system, such as an exterior vented exhaust system, dust collector or shop vacuum with Hepa filter.

Excessive smoke can shorten the life of the laser diode by clouding the lens causing it to reflect back into itself and prematurely burning it out. Occasional cleaning of the lens is necessary. See page 11 for maintenance information.



1.1 Instructions for SAFE operation

1. Read safety and operating instructions before using the Moray Laser.
2. Take time to fully understand how to safely operate the Moray Laser.
3. Position the Moray Laser on a bench that is stable and easy to access.
4. Always wear laser eye protection while operating your Moray Laser.
5. **DO NOT** engrave or cut PVC or vinyl plastics. Laser engraving or cutting PVC or vinyl plastics will emit toxic and corrosive fumes that will harm you and your machine as well as other people and tools in your shop area.
6. **SMOKE AND FUMES WARNING** Depending on your project, laser engraving can produce a significant amount of smoke and fumes during operation. Appropriate ventilation or filtration is required. Options include external exhaust ducting or laser appropriate air filtration system. For light duty engraving some users have found that a good quality shop vacuum equipped with a HEPA or charcoal filter is adequate. But failure to properly exhaust or filter the smoke while laser engraving will expose you and others to irritating and possibly harmful fumes.
7. Never attempt to adjust the work piece or move the Moray Laser while the laser is running. This could expose you or those nearby to harmful laser radiation and damage your machine.
8. Never open the red safety lid while the laser is running. This could expose you or those nearby to harmful laser radiation.
9. Use the Pause or Estop buttons to pause or stop the Moray Laser in the middle of an operation.
10. Never leave the Moray Laser unattended while it is running.
11. While operating the Moray Laser, keep a multipurpose dry chemical fire extinguisher nearby. It must be rated for both A & C fires
12. The laser beam operates at a very high temperature when engraving and cutting the material. The burning action can cause the material to burst into flames. **DO NOT LEAVE UNATTENDED.**
13. For added safety and convenience, connect your Moray Laser to a power strip with an on/off switch. This provides an additional way to turn off the machine in case of an emergency.
14. Do not engrave with the machine held vertically, overhead or at angle. Doing so could cause serious injury to you or others nearby. Use the Moray Laser only in a horizontal position.

1.2 Emergency Stop

There are three ways to quickly cut power to the laser and stop machine movements.



The **E-Stop** button appears on several different screens. Use it when you need to quickly shut off the laser beam and stop the machine movements.



Turning OFF the main power switch is the second option. This will cut power to the entire machine. **NOTE** : Turning off the power switch will also clear all X Y positions setting and you will need to reset them and restart your file from the beginning.



Using a power strip with your Moray Laser is optional, but strongly recommended. It also provides a third way to quickly shut down the machine. Switching the power strip off has the same effect as turning off the power switch on the machine.

Section 2 – Protecting your Moray Laser from damage

1. Periodically clean the laser lens with a soft cotton swab and isopropyl alcohol or a camera lens cleaning kit. Dust and particle build-up on the lens will cause the laser beam to reflect back up into the laser modular and cause premature failure.
2. Keep your Moray Laser away from moisture and in a temperature range of 50 to 80 degrees F.
3. With the power off, lightly vacuum the Moray Laser machine internal components to removed dust and particles.
4. Do not expose the system to high humidity – this may cause condensation on the electronics and result in abnormal behavior or cause the electronics to fail.
5. You should not operate your Moray Laser during a thunderstorm unless you have an appropriate surge protector in place to prevent circuits from being damaged by excessive line voltage.
6. Keep dust collection hoses away from the motors and electronics. Dust collection hoses can discharge static charges damaging the electronics.
7. It is also strongly recommended that you keep backup copies of all important computer data, files and programs. These should be separate copies – stored on a different device than the computer you are using to create the projects and run them on the Moray Laser.

Section 3 – Cleaning and maintenance

Before each use

- Check for damaged wires or components. Repair or replace as needed.
- Check for loose or worn parts. Tighten, adjust or replace as needed.

After each use

- Clean the inside area after each use. Dust, vacuum and wipe as needed to remove material remnants, dust and ash/carbon particles.

Weekly or after every 8 hours of use

- Wipe down the bars with a soft cloth.
- Clean the laser lens with a soft cotton swab and isopropyl alcohol or a camera lens cleaning kit. Dust and particle build-up on the lens will cause the laser beam to reflect back up into the laser modular and cause premature failure.

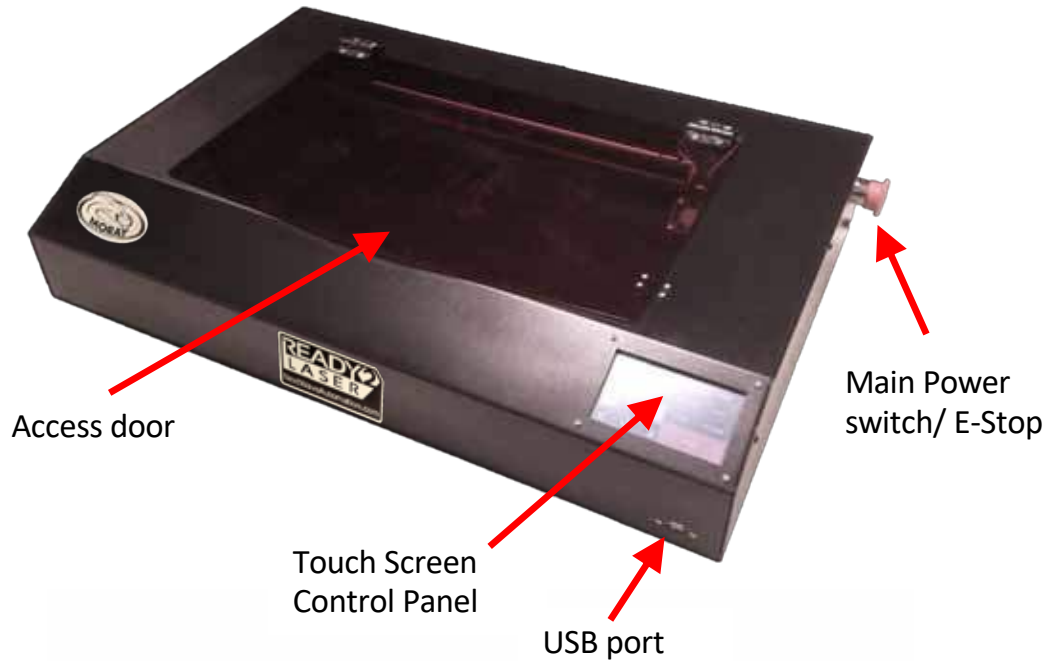
Monthly or after every 40 hours of use.

- Apply a light coat of dry lubricant to the bars. Wipe off excess with a soft rag.

As needed

- Vacuum dust off machine and components including Controller and Pendant.
- Clean the case and red safety door with a mild cleaner and soft cloth.
- DO NOT use abrasive cleaners or sponges to clean any part of the Moray Laser, as they will scratch the surfaces
- DO NOT use paint solvents to clean any part of the Moray Laser.
- If the display control panel needs cleaning, use a computer screen cleaner or camera lens cleaning fluid

4.1 Machine components - Outside



Vent hose connector and mounting hardware



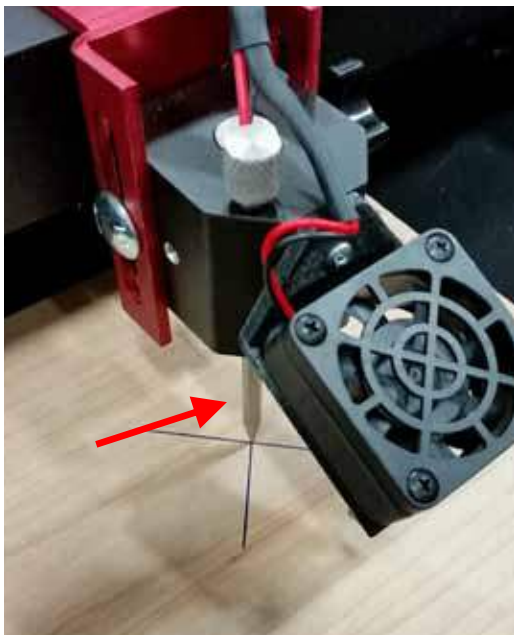
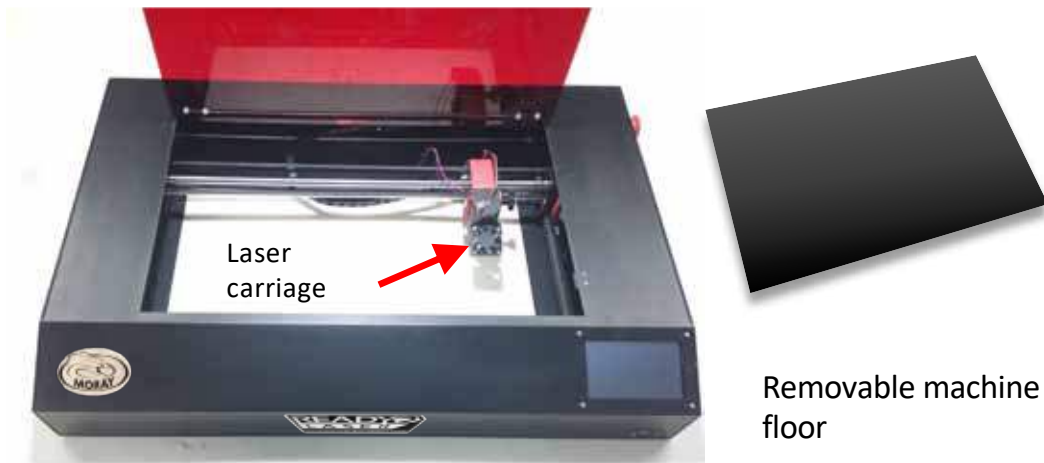
Power Supply



Power strip (supplied by customer)

4.2 Machine components - Inside

The inside work area of the Moray Laser can accommodate material up to 18" wide by 12" tall by 1" thick. Removing the machine floor permits the Moray Laser to engrave on top of larger materials. Use the Moray Laser only in a horizontal position. Do not attempt to engrave with the machine held vertically, overhead or at an angle. Doing so could cause serious injury to you or others nearby and damage your machine.



Removable Zeroing Rod

Laser carriage height adjustment knob

Section 5 – First-time setup instructions

The following steps will guide you through the initial setup of your Moray Laser.

- Start by familiarizing yourself with the machine's various components on pages 12-13.

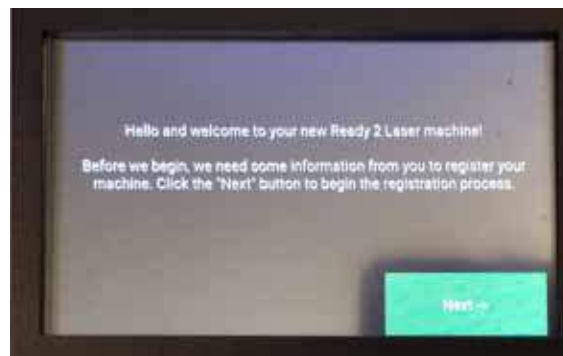
5.1 Power supply hookup

- Set the main power switch to OFF (pushed in)
- Connect the power supply to a power source and your machine. Using a power strip with surge protection is strongly recommended.
- Turn the main power switch to ON by rotating the red knob clockwise until it pops out to the ON position.



5.2 Registration

- The first time you power up your Moray Laser you will see the welcome screen.
- Click **Next**.



- The next screen shows a QR code that you can use to register your Moray Laser via your cell phone **OR** via the web at:



<https://portal.nextwaveautomation.com>

- Each of the registration methods will take you too this form.
- Fill out the form with your information and click **Submit**.
- NOTE: the appearance of the form many vary from the one shown here.

Next Wave Automation Registration

Register Your CNC

CNC Model* Pendant Code*
Enter the 8 digit code from the pendant.

First Name* Last Name*

Company Phone

Email*

Country*

Address*

Address 2 (Suite / Apartment)

City* State*

Zip Code

SUBMIT

- The next screen will show your **Unlock Code**. The Unlock Code will also be sent to your emails. Check your spam if it fails to arrive in your regular inbox.

nextwave-innovation.com/machine-reg 7

Your response has been recorded.

Unlock Code: 55002

CNC Model: r2l
 Pendant Code: 2800-0000
 First Name: [redacted]
 Last Name: Johnson
 Company: [redacted]
 Phone: [redacted]
 Email: johnson@nextwave-innovation.com
 Country: US
 Address 1: 22 [redacted] St
 Address 2: [redacted]
 City: [redacted] Heights
 State: OH
 Zip: 44118

- Enter the **Unlock Code** into the field on your machine and press the **Registration** button



- The Home screen will now appear and you can start using your Moray Laser.
- For detailed information about the Home screen and it's functions, see page 18.



5.3 School Registration

ATTENTION SCHOOLS: You will typically need to have administrator rights to register because of school security restraints. If you received a registration error message there are a couple things to try: assuming you have an internet connection.

1. Use a different browser and register again
2. Use a different computer to register.
3. Send tech support ALL the information from the form or a screen capture of the form and we can generate a working Unlock Code for you.

If you received the success message and did not get a key code back in your email please:

- 1.) Check your trash and spam email folders.
- 2.) Register again but use a different email address

If you still have registration problems, please contact our Technical Support team. See page 5 for contact information.

Section 6 – Touch Screen Control Panel

This section provides a detailed information about the touch screen control panel , the various screens, buttons their functions.

6.1 Home screen

The Home screen (fig. 6.1a) is the main screen that appears when the Moray Laser is first turned on. It's also the main screen that provides access to the other function screens. The function of each Home screen button is described below.

X,Y position displays – Show the current position of the X and Y axes. Pressing on the number opens the Keypad screen.

Manual jog buttons – Pressing these buttons will move the laser carriage in the corresponding direction.

Jog speed – Shows the current jog speed used when manually jogging the tool. Pressing on the button will toggle the speed setting between Slow, Medium or Fast.

Refresh – The "Refresh" button manually requests a position update from the controller. Particularly useful after using the E-Stop button, which may cause the display to go out of sync with the controller.

Keypad – Opens Keypad screen (see page 20)

Move to 0,0 – Moves laser carriage to X,Y zero location.

Set to 0,0 – Sets the current location of the laser carriage to 0,0.

Options – Opens options screen. (see page 19)

Run G-Code – Opens Run screens. (see page 28-31)

E-Stop – Turns off laser and stops all movement.

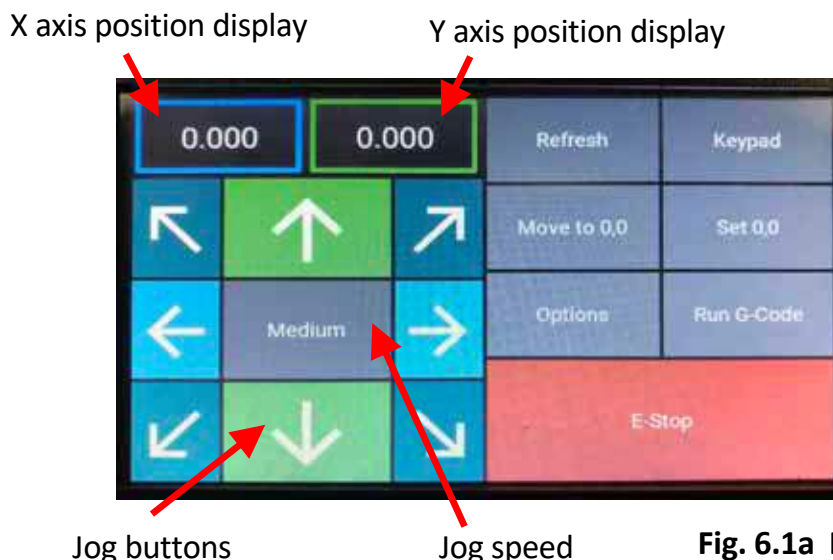


Fig. 6.1a Home screen

6.2 Options screen

Access the **Options** screen (fig. 6.2a) with the Options button on the Home screen. The function of each Options screen button is described below.

Factory Reset – Not needed during normal operation. Primary used by Tech Support to reset controller software during troubleshooting.

Test Laser – Test fires laser.

Exit – Closes Options window and returns screen to the Home window.

Product information – Lists machine numbers and software versions. Have this information available when contacting Technical Support. Record this information for your Moray Laser on page 6.

Zero at Zeroing Rod – Press checkbox to set the default to ON or OFF for this function. When the box is checked, the XY zero position will be set to the location of the Zeroing Rod, rather than the laser. See pages 22,23 for more information on using this option.

Move Zeroing Rod to Target Position – Press checkbox to set the default to ON or OFF for this function. When the box is checked the Zeroing Rod will move to the "Target Position" which is an offset from laser beam XY zero location. See pages 24-27 for more information on using this option.

Minimize Overburn – Press checkbox to set the default to ON or OFF for this function. This function reduces laser intensity at corners, angle and at the start and end points of closed lines (i.e. circle) Leave unchecked when doing heavy burning.

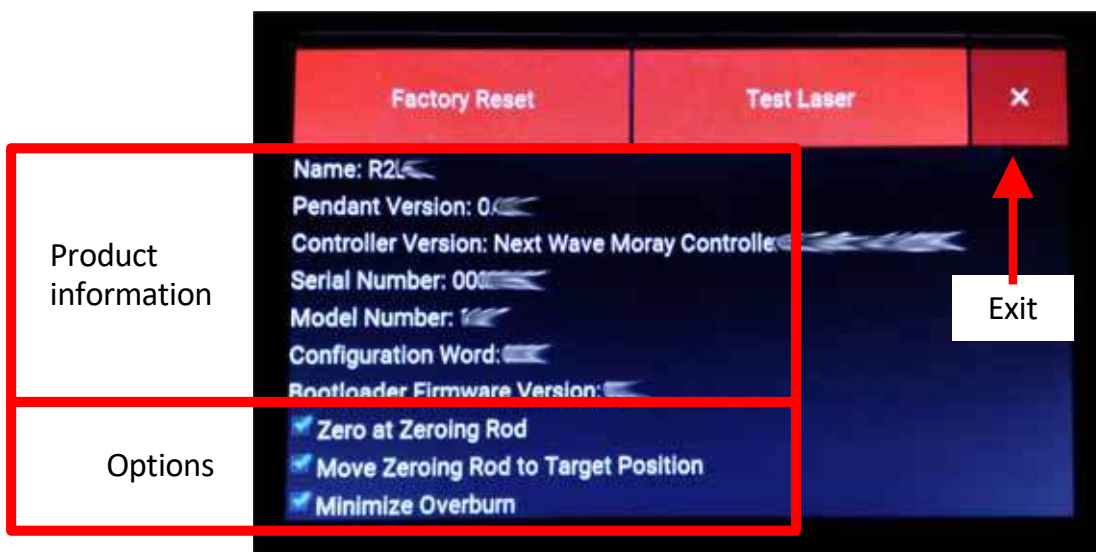


Fig. 6.2a Options screen

6.3 Keypad screen

Access the Keyboard screen (fig. 6.3a) with Keyboard button on the Home screen. The function of each Keypad button is described below.

Position recall – Recalls the last "set position" of the XY axis.

X,Y position displays – Show the current position or edited positions for the X and Y axes. Pressing on the number activates the keyboard numbers for that axis.

Backspace – deletes the numbers in the active position display.

Exit – Closes Keypad window and returns screen to the Home window.

Positive/Negative position toggle – toggles active position between positive and negative.

Number keys – Use to enter the values in the position display fields. Keys will glow blue when active for the X axis and green when active for the Y axis.

Math keys – Use in combination with the number keys to create calculated values in X and Y position display fields.

Jog speed – Controls the jog speed when using the GO key. Pressing the button will toggle jog speed between Slow, Medium and Fast.

Clear – Zeros out both the X and Y display fields

Set Position – Calibrates the location of the laser carriage to match the values in the position display fields.

Relative – GO moves are made relative to is current XY position.

Absolute – GO moves are made based on the current XY zero (Home) setting.

GO – Pressing the button will move the laser carriage to the settings listed in the XY position fields.

E-STOP –Turns off laser and stops all movement.

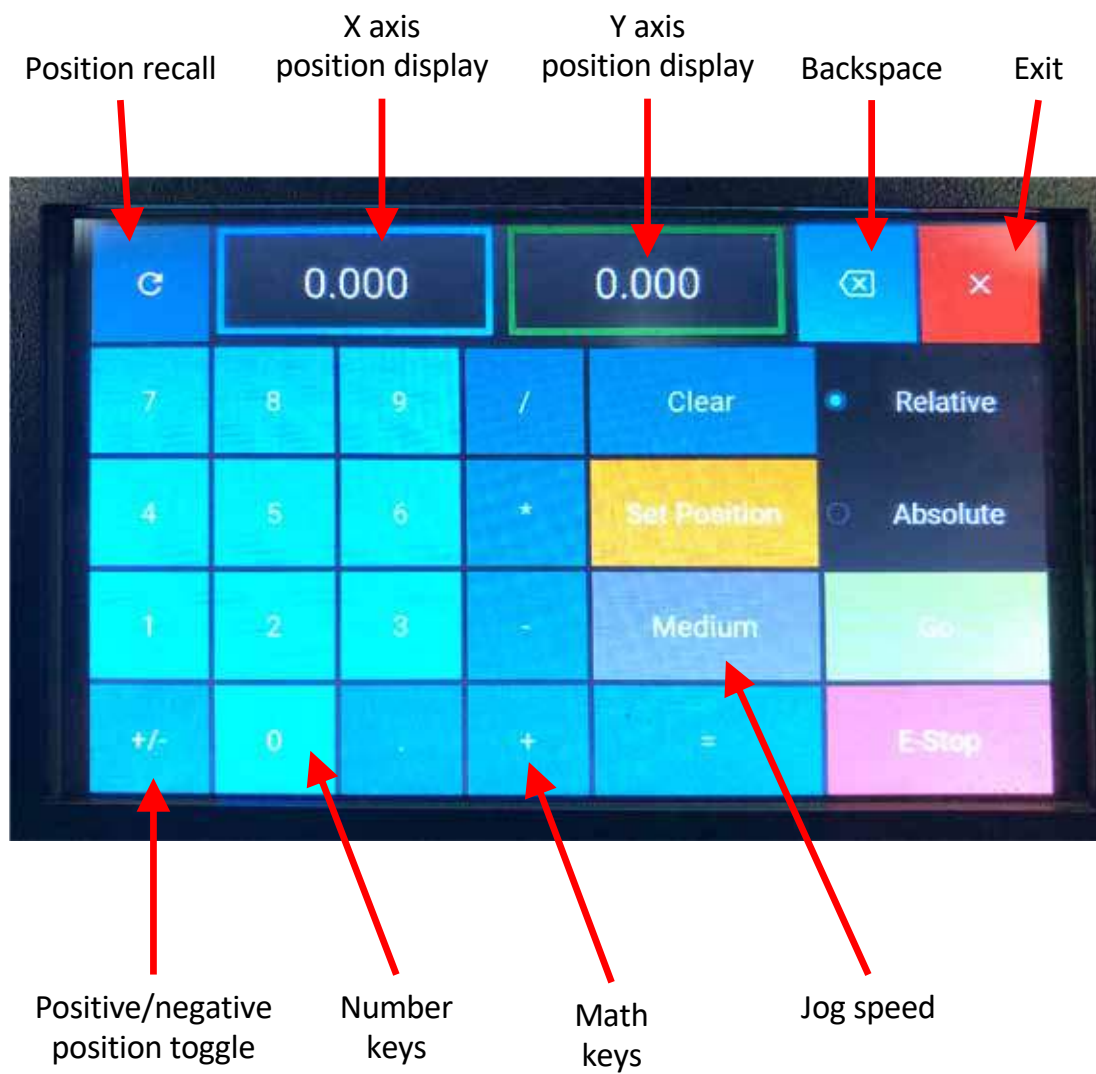


Fig. 6.3a Keypad Window

6.3a Zeroing at the Zeroing Rod option

The **Zero at Zeroing Rod** option provides an easy way to accurately set the XY zero location for the laser beam. The steps below show the process.



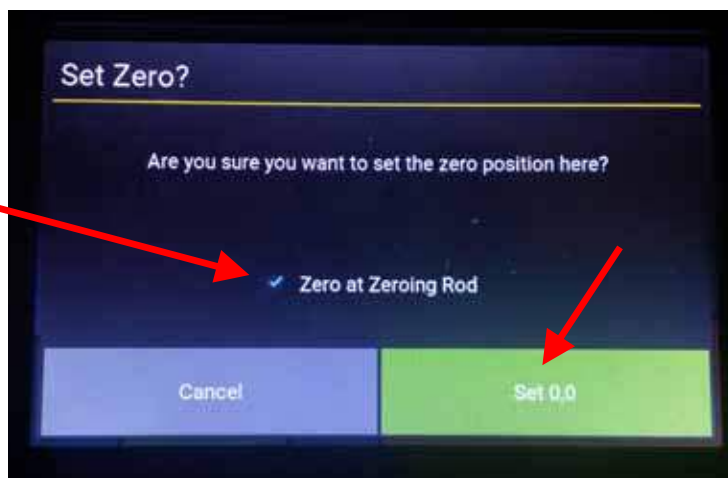
Step 1 – Move the **Zeroing Rod** to your desired XY zero location for the laser beam.

Step 2
Press **Set 0,0** button

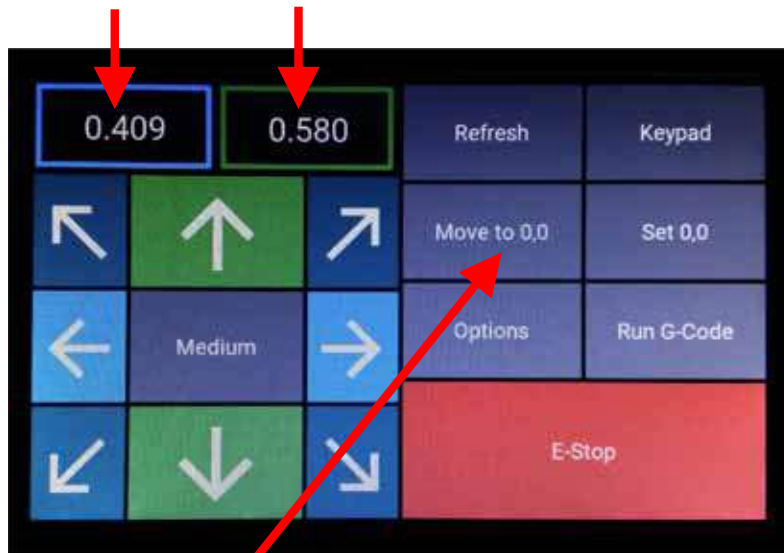


Step 3 – Check the box (if not checked)

Step 4
Press **Set 0,0** button

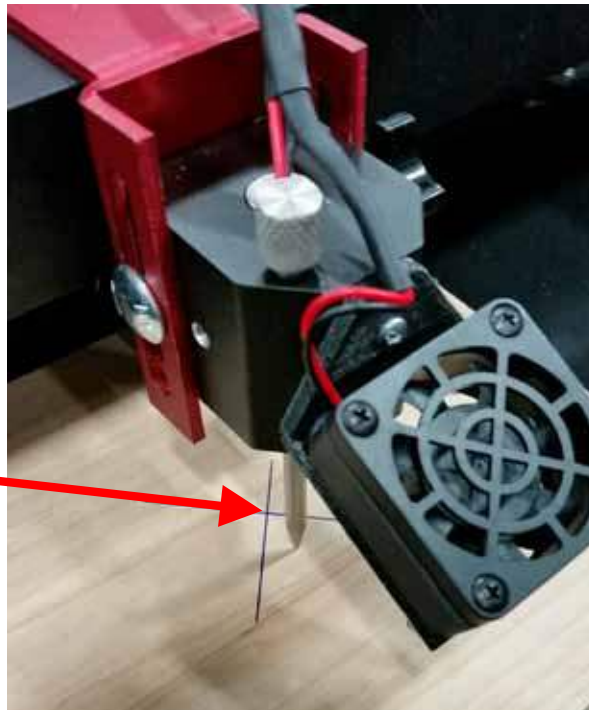


Step 5 – The XY display fields now show the offset distance that the laser is from the actual XY zero location, which is the tip of the Zeroing Rod.



Step 6 – Press **Move to 0,0** button

Laser is now over mark



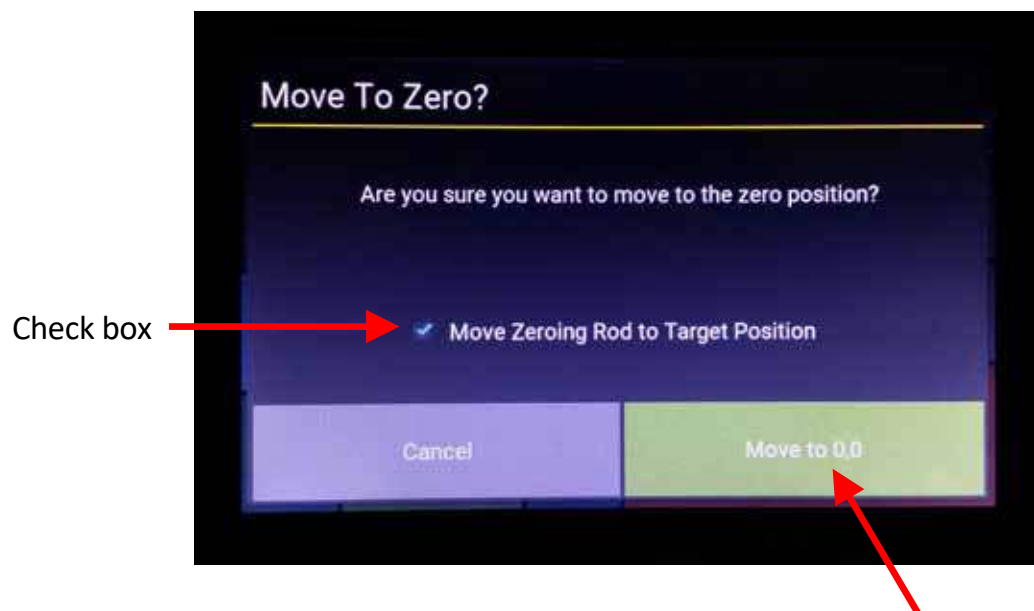
Step 7 – The laser carriage moves so the laser is now located directly over the XY zero mark, and the Zeroing Rod is now offset from the mark.

6.3b Move Zeroing Rod to Target Position (Method 1)

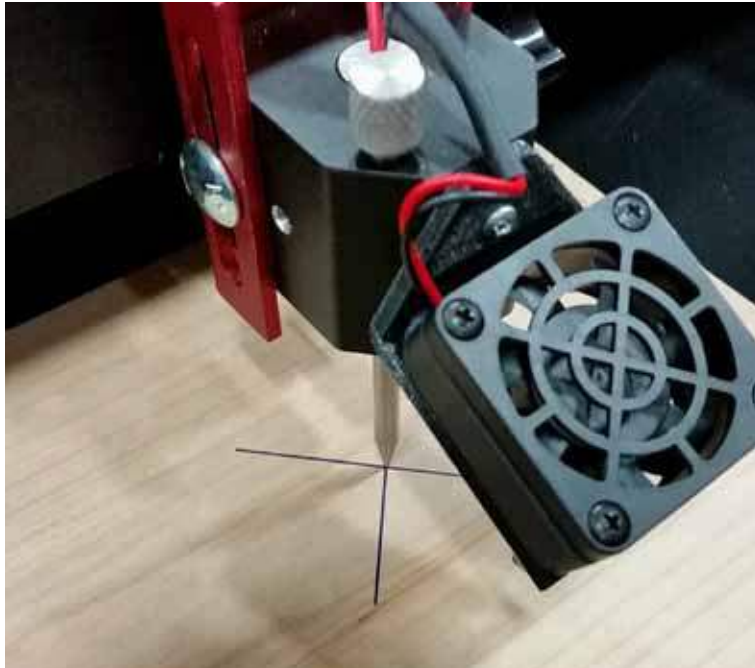
The following steps show how to use the **Move Zeroing Rod to Target Position** option to move the Zeroing Rod back to the XY zero position, which is the "target position" in this case.



Step 1 –Press the **Move to 0,0** button to start the process of moving the **Zeroing Rod** to the XY zero "target" position. The XY Position fields show the current location of the laser.



Step 2 – This verification screen appears next. Check the box (if needed). Then press **Move to 0,0** button



Step 3 – The laser carriage now moves until the **Zeroing Rod** is centered over the "target position", which is the same as the XY zero location.



Step 4 – Since the Zeroing Rod is over the XY zero position, the XY position fields now show an offset position for the laser.

6.3c Move Zeroing Rod to Target Position (Method 2)

The following steps show how to use the **Move Zeroing Rod to Target Position** option to move the Zeroing Rod to a specified "target position" on the material.



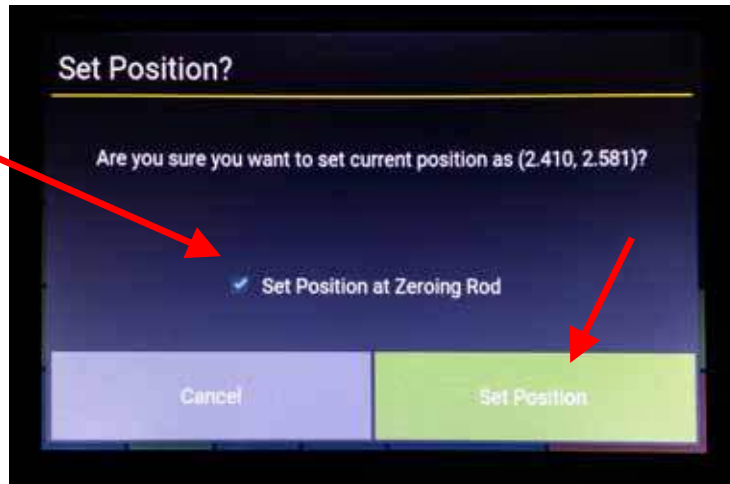
Step 1 – Press the **Keyboard** button to start the process of moving the **Zeroing Rod** to specified "target" position. The XY Position fields show the current location of the laser.



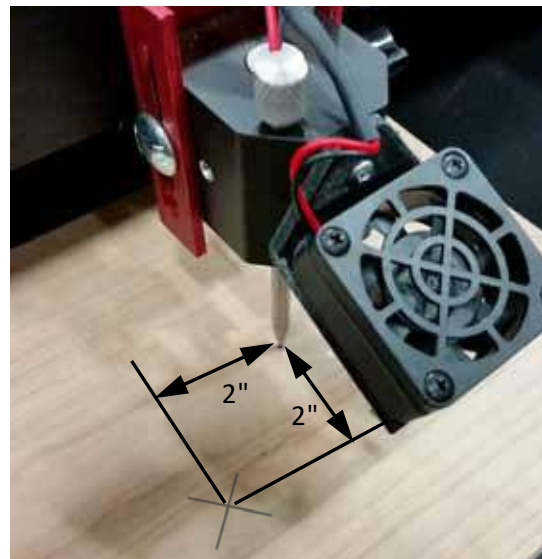
Step 2 – Enter the XY "target" position that you want to move the rod to. Select **Absolute** move mode. Then press **Go** to initiate the move.

Check box

Step 3 – This verification screen appears next. Check the box (if needed). Then press **Set Position** button.

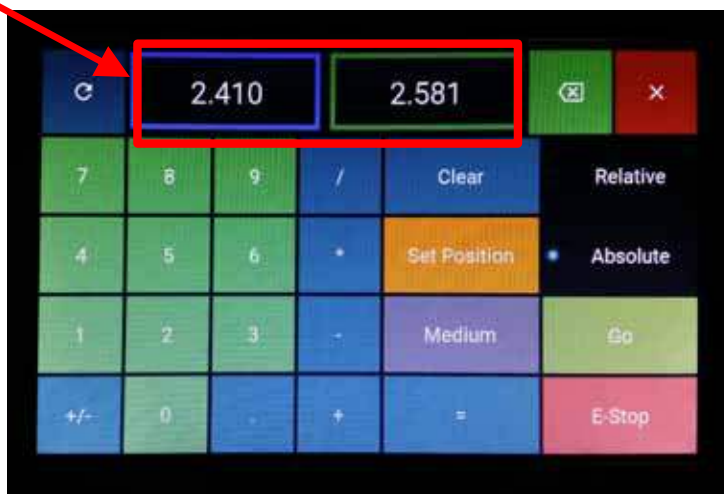


Step 4 – The Zeroing Rod is now positioned over the specified "target" point.



New laser position

Step 5 –The XY position fields now show the position of the laser (not the Zeroing Rod). If you want the laser to be over the "target position" leave the checkbox in Step 3 unchecked.



6.4 Run G-Code button

Pressing the Run G-Code button on the Home screen opens a series of screens that are used to run the g-code (.tap) files for your designs.

Pages 29-31 provide detailed information on each of the screens associated with the Run G-Code button.

Page 32-40 provide detailed step-by-step instructions on how to run g-code (.tap) files.



Press the Run G-Code button to advance to the next screen (see page 29.)

6.4a File Storage screen

After pressing the Run G-Code button, the first screen to appear is the **File Storage** screen (fig. 6.4a) It lists the g-code (.tap) files that are stored on your USB drive and on the internal storage of the machine. The function of each File Storage button is described below.

Internal Storage – When this button is pressed, the button glows light blue and the list of files below are the ones stored on the machine.

USB– When this button is pressed, the button glows light blue and the list of files below are the ones stored on your USB thumb drive.

Selected file – Pressing on a file icon "selects" it. The selected file glows grey.

Run – Pressing the Run button launches the Run window for the selected file.

Move – Pressing the Move button moves the selected file from one storage location to the other (i.e. USB to Internal or visa-versa)

Delete – Pressing the Delete button permanently deletes the selected file. This cannot be undone.

Exit – Pressing this button returns you to the Home screen.

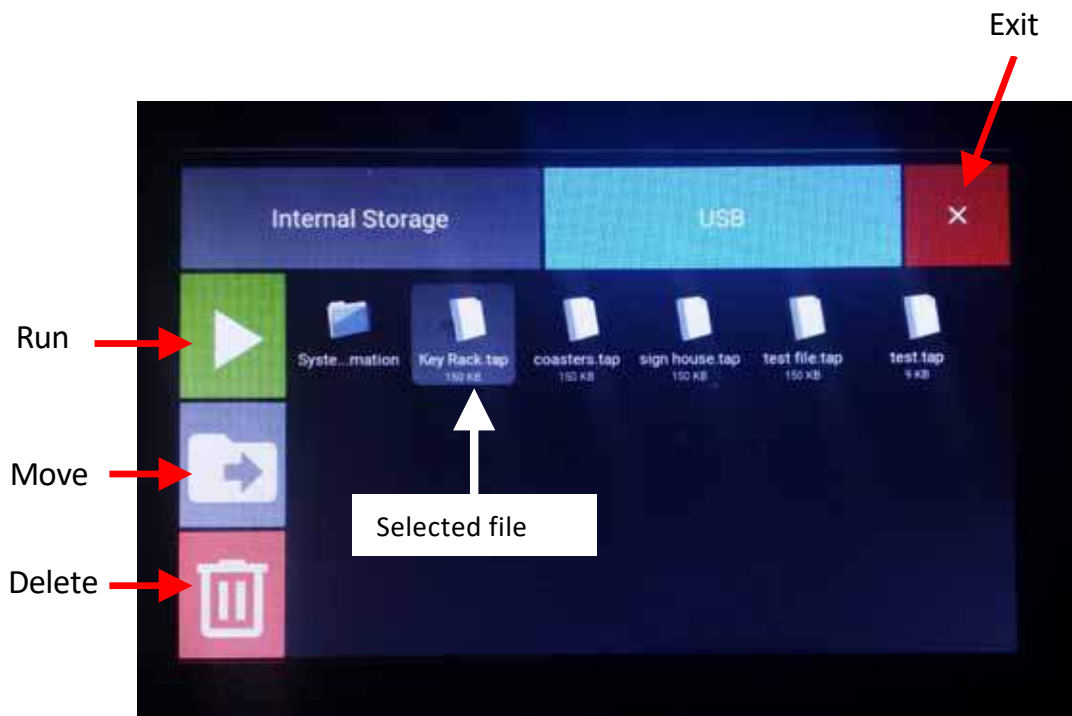


Fig. 6.4a File Storage screen

6.4b Run screen

The **Run** screen (fig. 6.4b) appears after the File Storage screen. The **Run** screen allows you to preview the g-code using the **Up** and **Down** buttons as well as set the option for **Overburn** control. You can also adjust the **Speed** and **Intensity** setting on this screen. Pressing **Run** will start the file and the laser beam will activate and the machine will start moving.

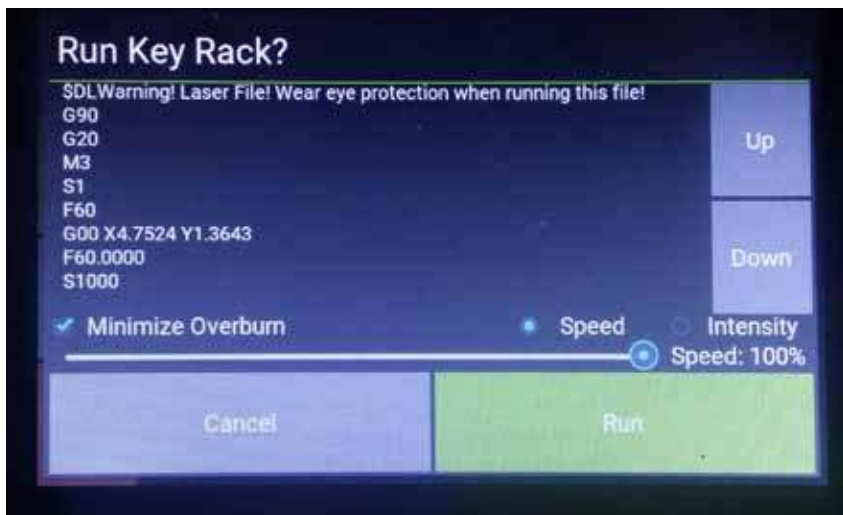


Fig. 6.4b

6.4c Warning screen

The **Warning** screen (fig. 6.4c) appears next. Make sure you and anyone nearby is using the necessary laser safety eye protections.

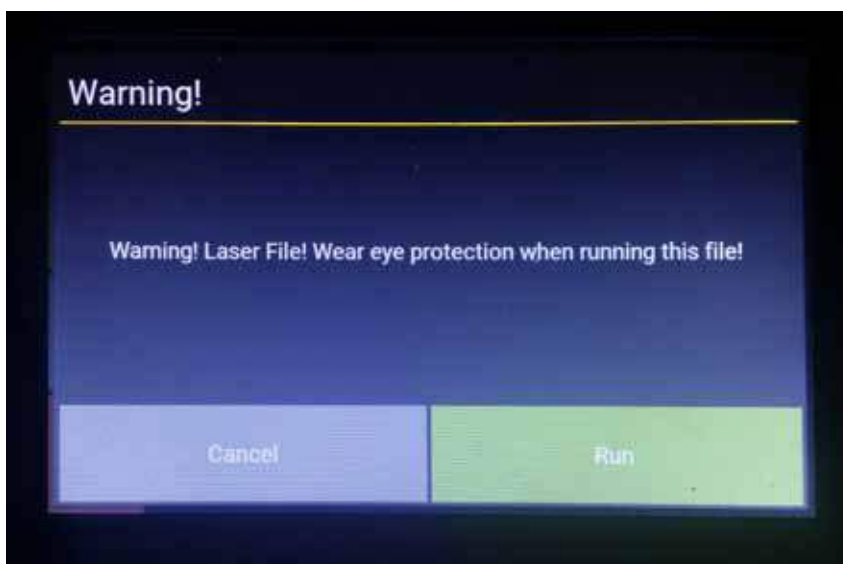


Fig. 6.4c

6.4d Progress screen

The **Progress** screen (fig. 6.4d) appears next. At the bottom of the screen it shows elapsed time, percentage complete and lines sent. This screen also allows you to adjust the current **Speed** and **Intensity** settings, as well as **Pause** (and **Restart**) the G-code. Pressing the **E-Stop** shuts off the laser and stops all machine movement. After pressing the **E-Stop** you will need to **Exit** the window to restart the file. You may also need to press the Refresh button on the Home screen to refresh the XY location. See page 18 for more information about the Refresh button.

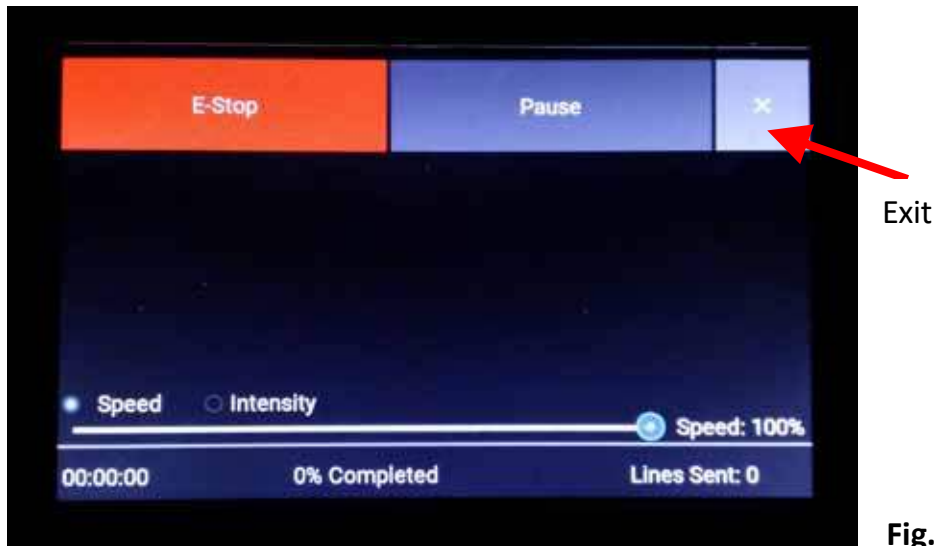


Fig. 6.4d

6.4e File Complete screen

The **File Complete** screen (fig. 6.4e) appears when the file is done. It gives you the options to rerun the file or return to the Home Screen.

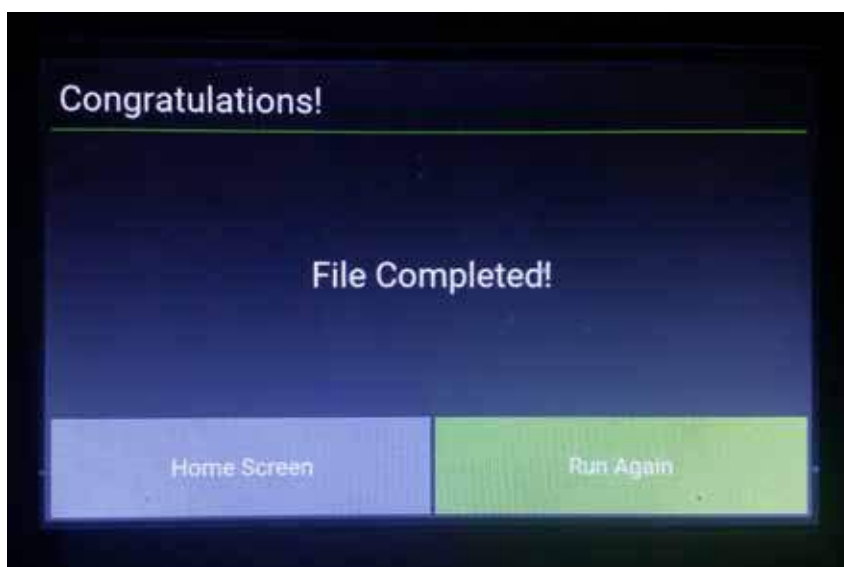


Fig. 6.4e

Section 7 – Moray Laser workflow (Step-by-Step).

Step 1 –Design your laser project.

You can design projects for your Moray Laser using either Ready 2 Design-Laser Edition (R2D-LE) or VCarve.



R2D-LE was developed by New Wave Automation as a simple and easy to use software for designing laser projects. With R2D-LE you can create vector, raster and dithered toolpaths and run them on your Moray laser. The R2D-LE software and users manual can be downloaded free at: portal.nextwaveautomation.com

The users manual for R2D-LE can be downloaded at www.nextwaveautomation.com/downloads-links

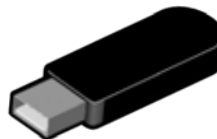


You can also use Vectric VCarve to create vector based laser designs for the Moray laser. See page 41 in this manual for information on using VCarve to create designs for the Moray.

A Moray Laser post processor for VCarve can be downloaded at: www.nextwaveautomation.com/downloads-links

Step 2 – Save g-code to a thumb drive.

Save your toolpath g-code (.tap file) to a USB thumb drive.



Step 3 – Turn on power switch.

Turn the power switch clockwise until it pops out to the ON position. It then takes about a minute for the touch screen control panel to fully activate.

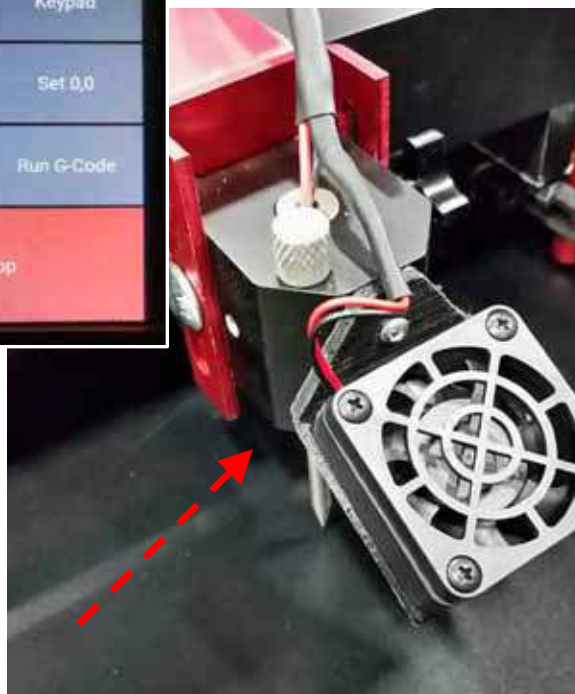




Step 4

Move laser carriage to a corner.

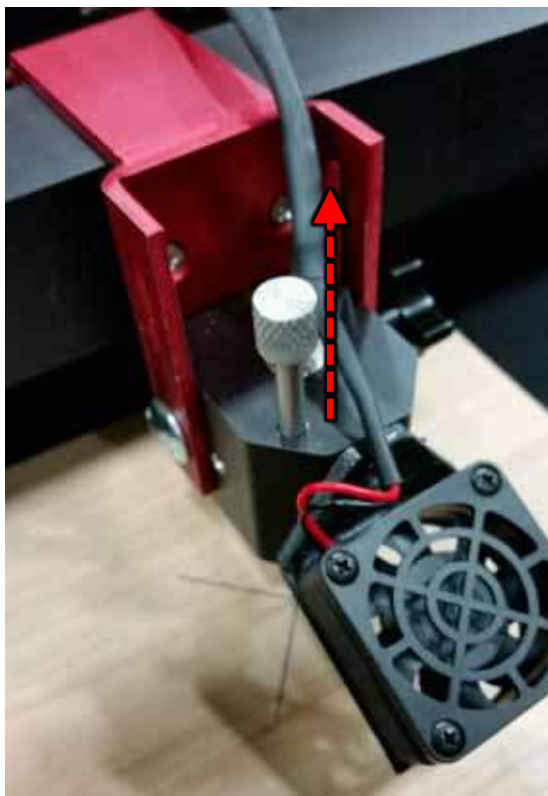
Use the jog buttons on the Home screen to move the laser carriage to a corner to give you room to place your material in the machine.

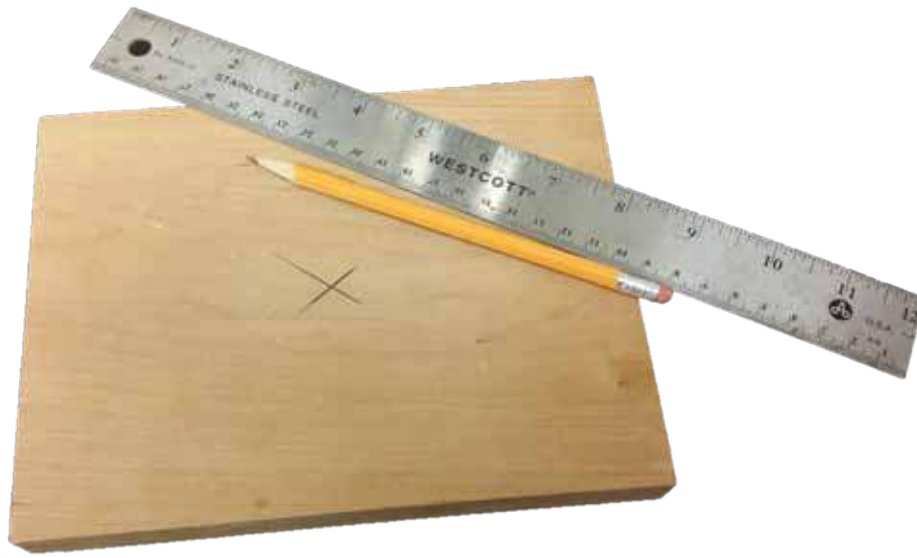


Step 5

Remove the Zeroing Rod from the laser carriage

This prevents it from dragging on the material during the following setup steps.



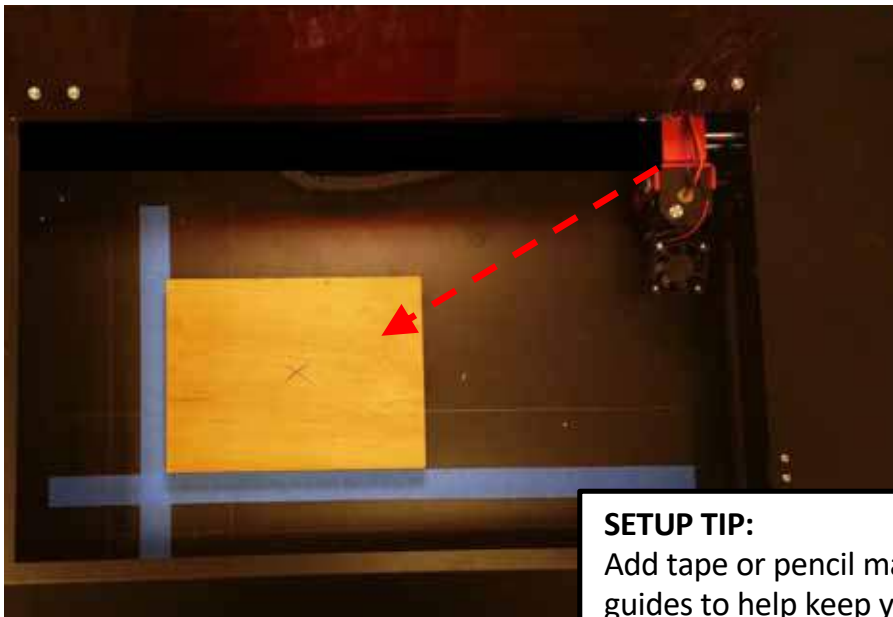


Step 6

Mark the XY Zero position on the material

For this project the XY zero is the center of the material.

No marks are needed when the XY Zero is set to one of the corners.



SETUP TIP:

Add tape or pencil markings as guides to help keep your material aligned with the machine.

Step 7

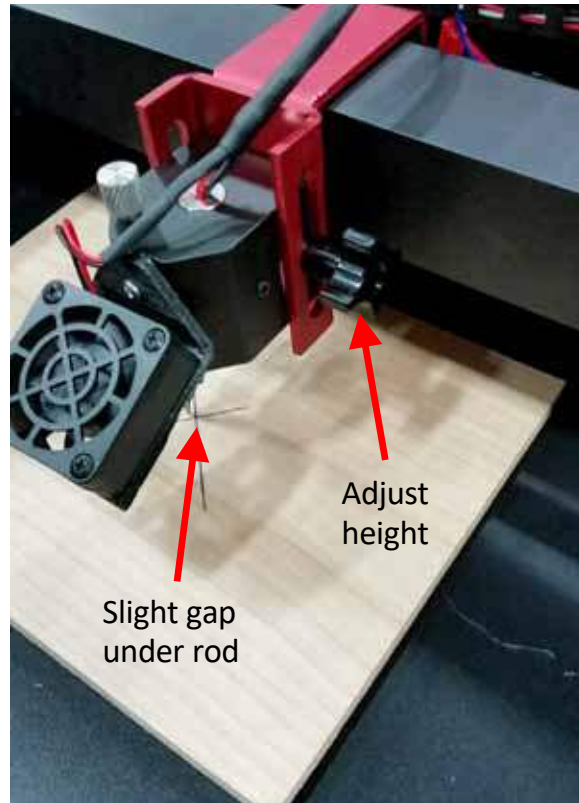
Place your material in the machine

Then jog the laser carriage so it's above the material.

Step 8

Adjust the height of the laser carriage.

Set the carriage height so the tip of the Zeroing Rod clears the material by about .05" or about 1/16". This height is also optimal for the laser beam. However, this is not a critical measurement and there's no need to use a feeler gauge or other measuring device. You just need the tip of the rod high enough to clear the material during the zeroing process. It's also OK to leave it in while laser engraving, as long as it doesn't drag on the material.



Step 9

Align the Zeroing Rod to the XY zero location.

Use the Jog buttons on the Home screen or the Keypad screen to jog the tip of the Zeroing Rod so it is centered over the XY zero location of your material.

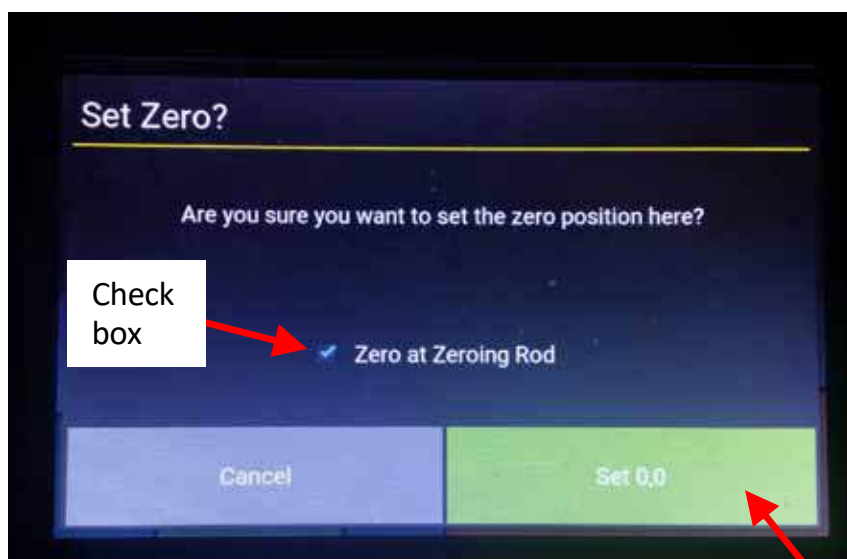




Step 10

Set the XY Zero position

Press the **Set 0,0** button on the Home screen.



Step 11

Confirm XY Zero position settings

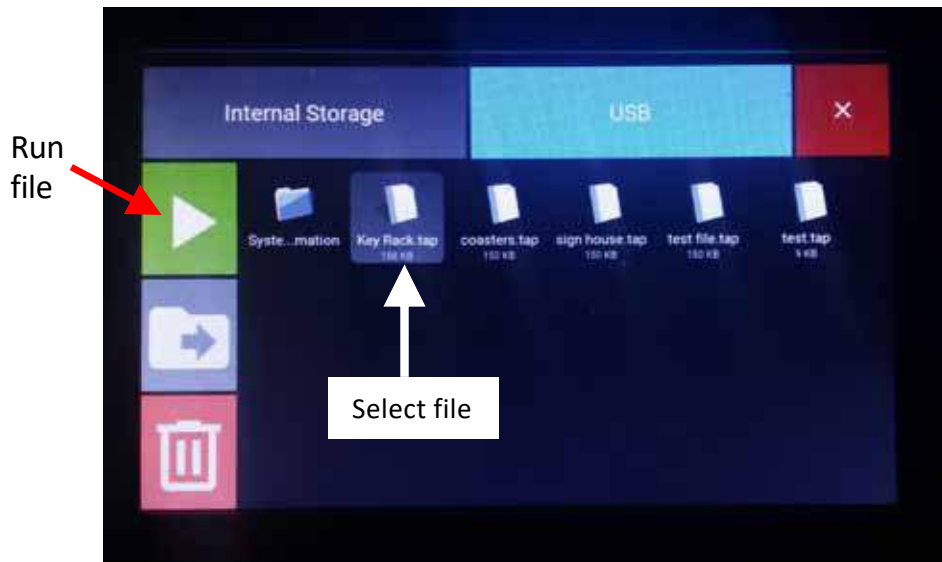
Make sure the box for **Zero at Zeroing Rod** is checked. Then press **Set 0,0** button to complete the XY zero setting. After this step, the Zeroing Rod can stay in the laser carriage – as long as it will clear the material and any other potential obstacles.



Step 12 – Insert the thumb drive into the USB port.



Step 13 – Press Run G-Code button on the Home screen.



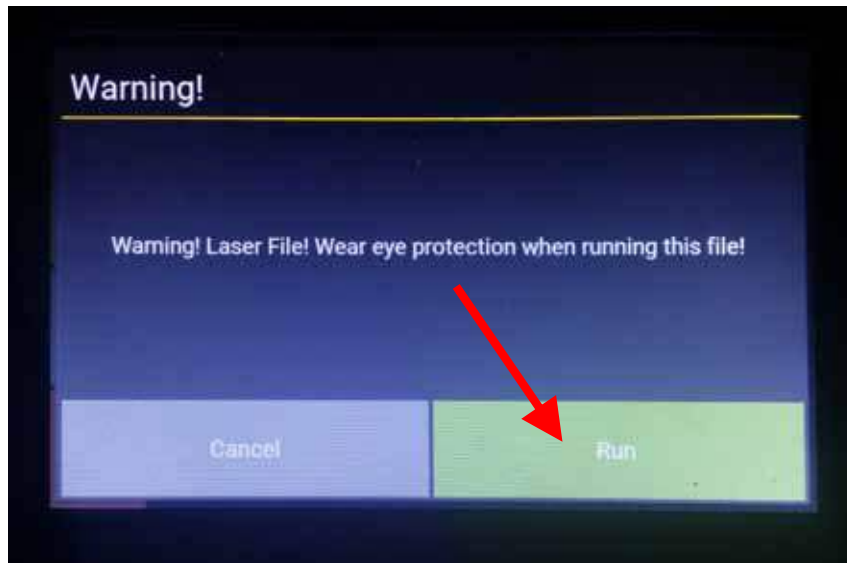
Step 14 – Select your g-code .tap file

The file storage screen appears next. It lists the g-code .tap files that are stored on your USB drive and on the internal storage of the machine. Press on the one you want to engrave. When selected it will glow light grey. Next press the **Run file** button. It may take a moment for the file to load after pressing the Run button.



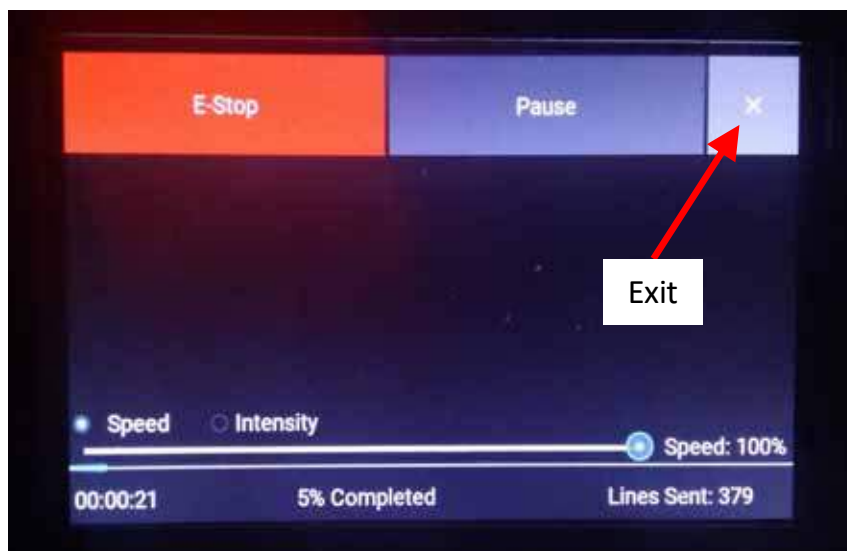
Step 15 – Confirm your file and adjust optional settings

Verify that the file name at the top of the screen is the correct file. You can also select the **Minimize Overburn** option from this window as well as manually adjust the **Speed** and **Intensity** settings. Adjusting the Speed and Intensity settings will override the g-code file setting.



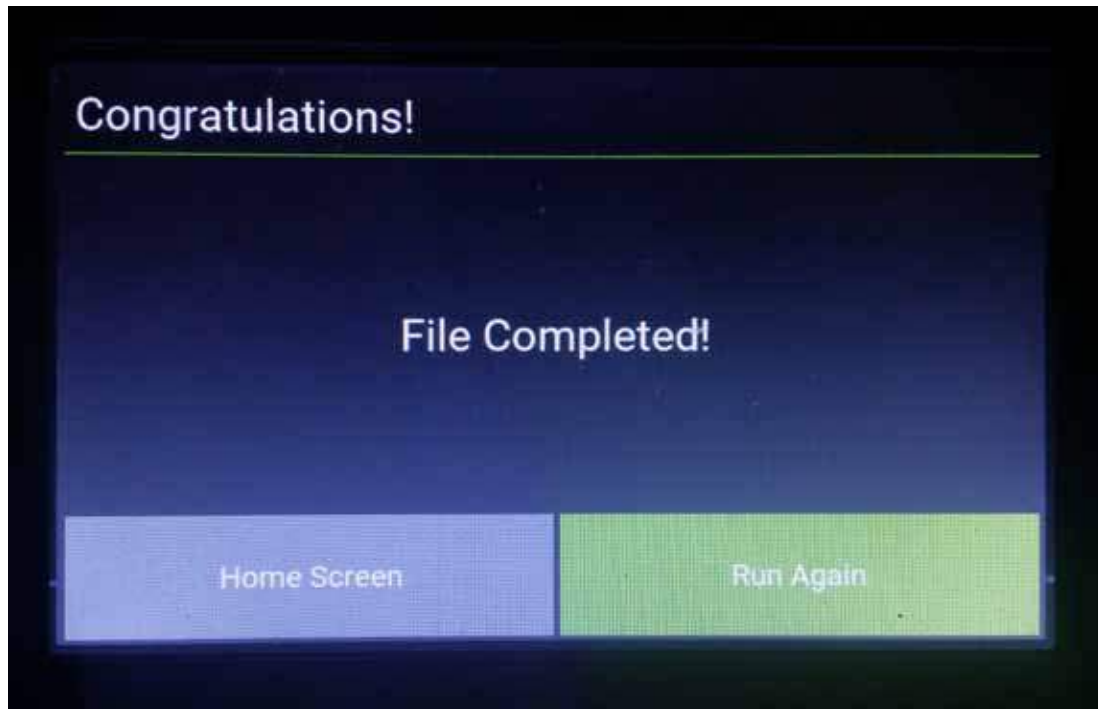
Step 16 – Protect your eyes!

Observe all safety precautions. Press **Run** to proceed.



Step 17 – Monitor the progress – DO NOT LEAVE MACHINE UNATTENDED

This screen gives you the elapse time, percentage complete and lines sent. You can adjust the current **Speed** and **Intensity** settings, as well as **Pause** (and **Restart**) the g-code. Pressing the **E-Stop** shuts off the laser and stops all machine movement. If you press the E-Stop you will need to press the Exit button and return to the Home screen to restart the file.



Step 18 – Congratulations, your file is complete.

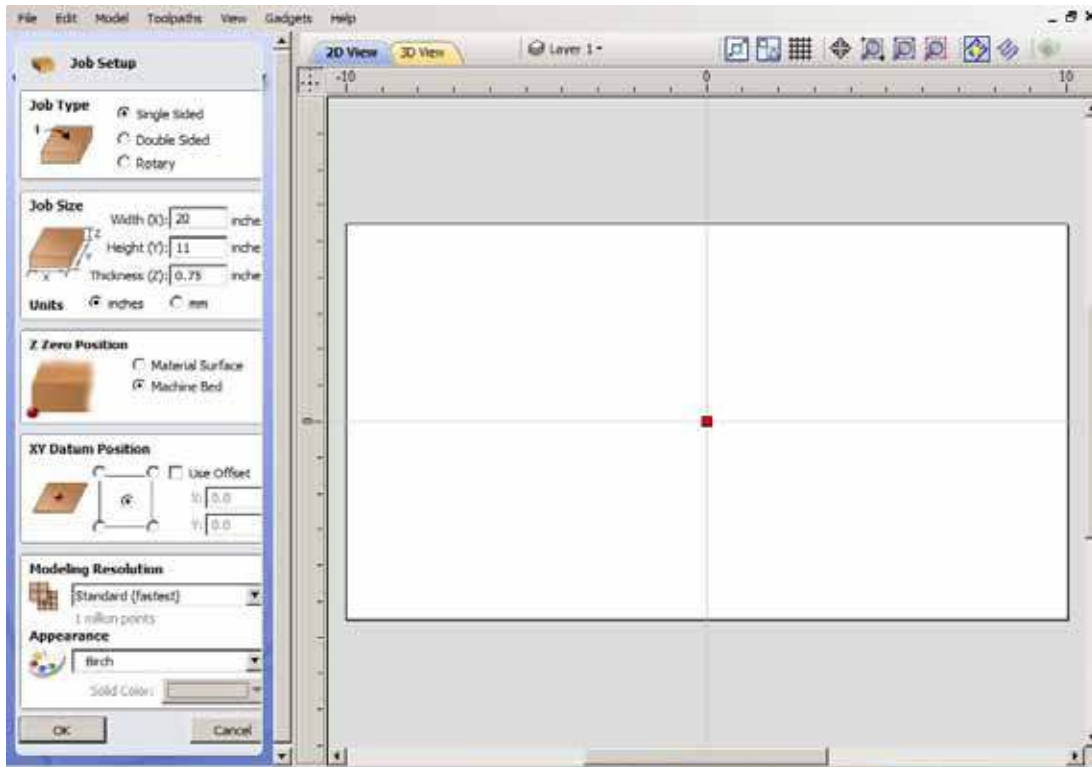
You can run it again from this screen or return to the Home screen to start a new project.

Section 8 – Moray Laser workflow summary*

*Not all of the following steps are required for every file or setup and some may need to be modified depending on the project.

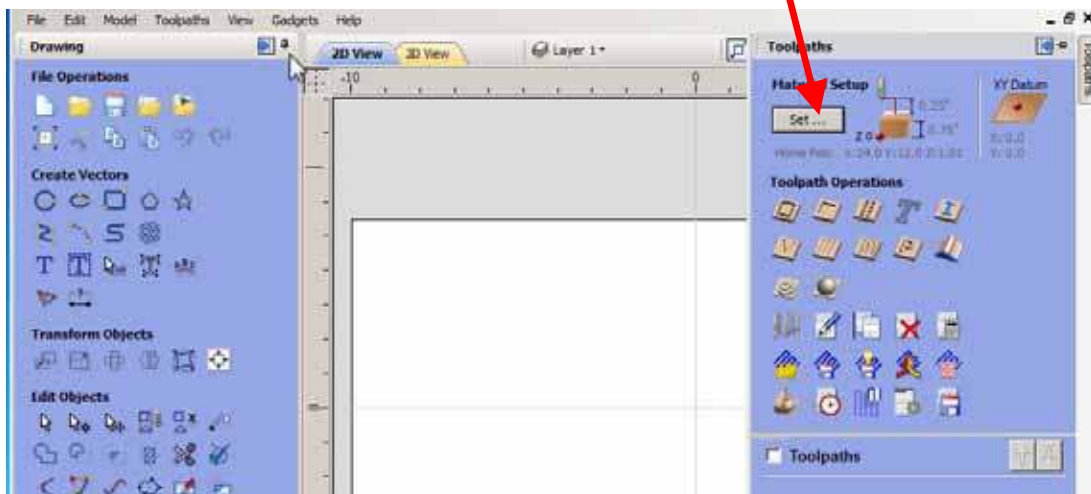
1. Create your design and toolpaths using Ready 2 Design Laser Edition (R2D-LE) or Vectric VCarve software.
2. Save toolpath g-code .tap file to a USB thumb drive.
3. Turn on main Moray Laser power switch.
4. Jog laser carriage to a corner.
5. Remove the Zeroing Rod.
6. Mark the XY zero location on your material.
7. Place material in machine and jog laser carriage over it.
8. Adjust laser carriage and Zeroing Rod height.
9. Align Zeroing Rod with the XY zero location for the material.
10. Press the "Set 0,0" button on the Home screen.
11. Confirm XY zero location setting.
12. Insert thumb drive containing your .tap file into USP port on the machine
13. Press "Run-G-Code" button on the Home screen
14. Select .tap file for your project
15. Confirm file settings
16. Use appropriate laser safety eye protection
17. Run file and monitor it's progress.
DO NOT LEAVE MACHINE UNATTENDED
18. File is complete.

Section 9 – Creating Moray laser toolpaths with VCarve

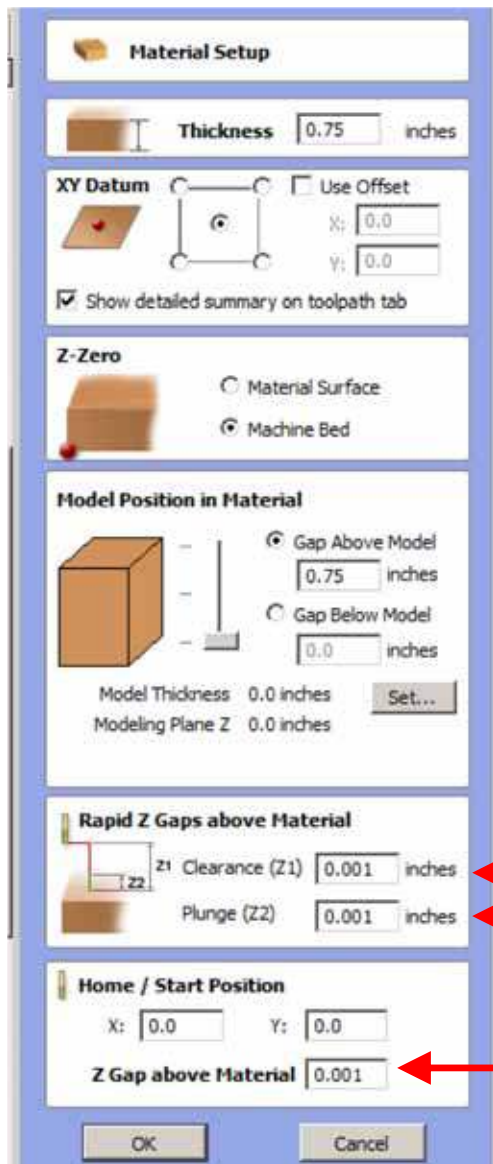


Step 1 Set your desired job size and settings. Click OK to close window.

Step 2 Open the Material Setup window



Section 9 – (cont.)



The image shows a 'Material Setup' dialog box with several sections. The 'Thickness' section has a value of 0.75 inches. The 'XY Datum' section has X and Y values of 0.0. The 'Z-Zero' section has 'Machine Bed' selected. The 'Model Position in Material' section has 'Gap Above Model' selected with a value of 0.75 inches, and 'Gap Below Model' set to 0.0 inches. The 'Rapid Z Gaps above Material' section has 'Z1 Clearance (Z1)' and 'Plunge (Z2)' both set to 0.001 inches. The 'Home / Start Position' section has X and Y values of 0.0, and 'Z Gap above Material' set to 0.001 inches. Red arrows point to the 'Z1 Clearance (Z1)', 'Plunge (Z2)', and 'Z Gap above Material' fields.

Material Setup

Thickness 0.75 inches

XY Datum ☐ Use Offset
X: 0.0
Y: 0.0
☒ Show detailed summary on toolpath tab

Z-Zero
☐ Material Surface
☒ Machine Bed

Model Position in Material
☒ Gap Above Model 0.75 inches
☐ Gap Below Model 0.0 inches
Model Thickness 0.0 inches
Modeling Plane Z 0.0 inches

Rapid Z Gaps above Material
Z1 Clearance (Z1) 0.001 inches
Plunge (Z2) 0.001 inches

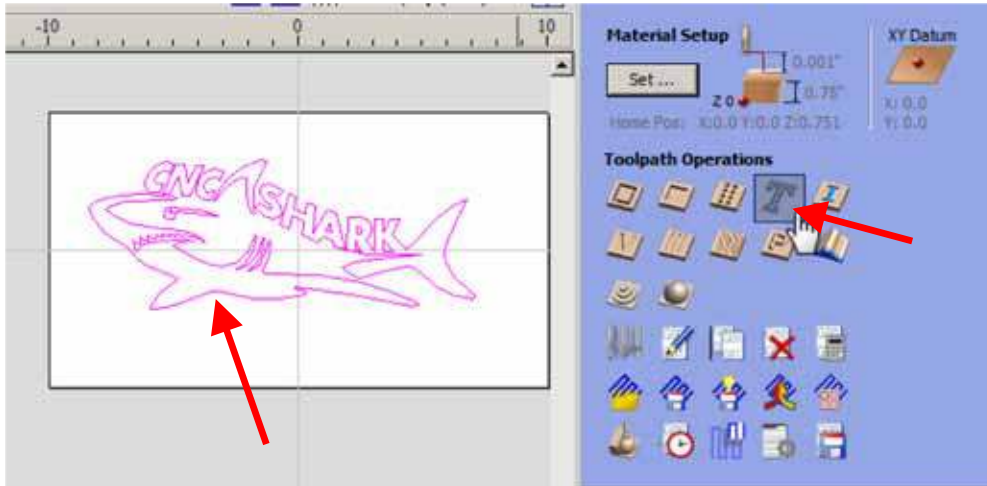
Home / Start Position
X: 0.0 Y: 0.0
Z Gap above Material 0.001

OK Cancel

Step 3

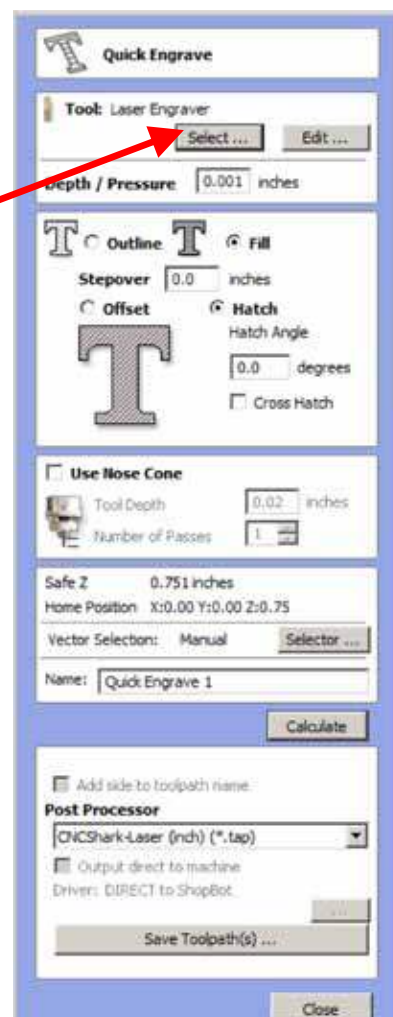
Change Clearance (Z1), Plunge (Z2), and Z Gap above Material to .001". This will prevent extra movement of the laser on the Z axis (up and down). See below at the Correct Settings picture. Click "OK".

Section 9 – (cont.)

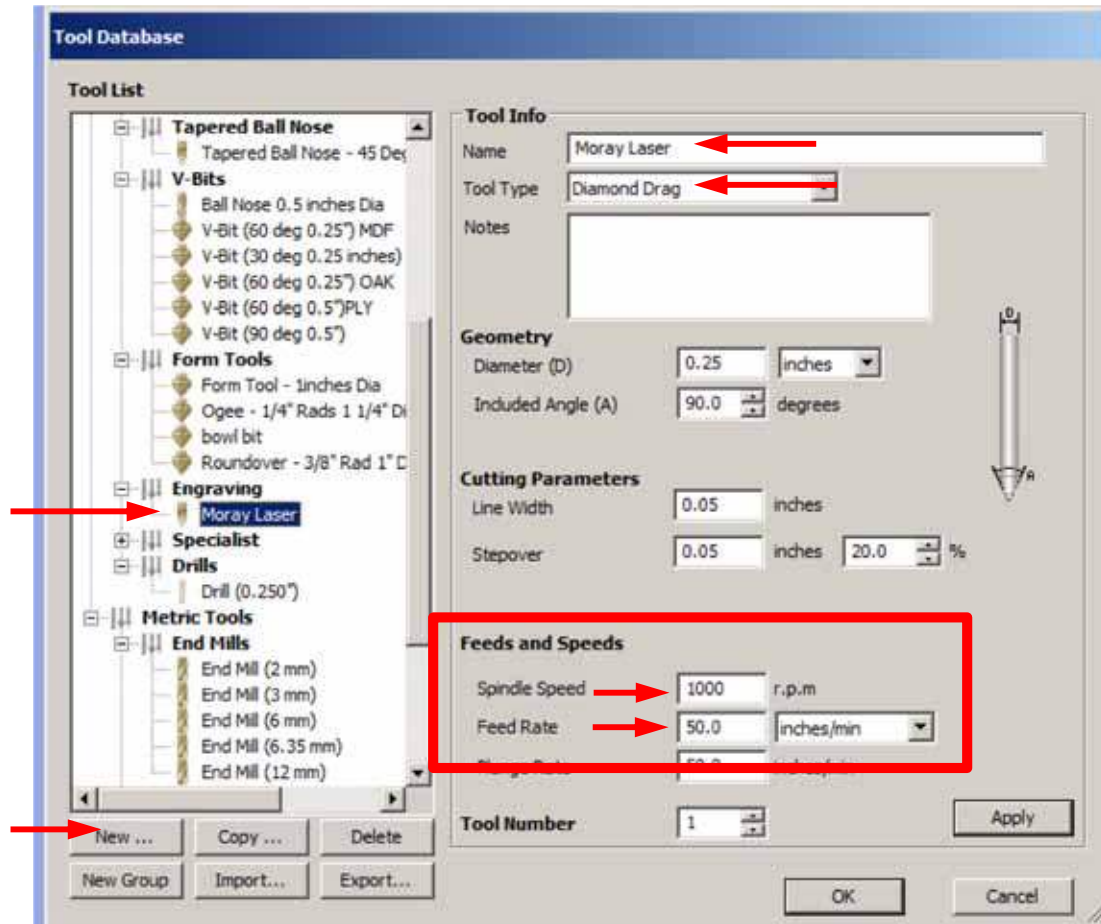


Step 4 Select vectors and open Quick Engrave toolpath

Step 5 Open Select tool window



Section 9 – (cont.)



Step 6

- Create a New tool based on a Diamond Drag.
- Place the new tool in the Engraving group or other group of your choice.
- Name the new tool Moray Laser.
- Enter the desired laser power in the Spindle Speed box
 - 0 rpm = 0% power
 - 1000 rpm = 100% power
 - Start with speed setting of 500 RPM /50% power for testing.
- Enter the desired Feed Rate.
 - Feed Rate can be set from 1 to 400 inches/min
 - Start with a feed rate of 60-120 for testing.
 - Dense materials will require a higher power and longer feed rates than less dense materials.
- The rest of the tool setting can be ignored as they do not apply to laser work.
- Click Apply to finalize changes.
- Click OK to close window.

Section 9 – (cont.)

Step 7

Set Depth/Pressure to .001. This will allow you to preview the toolpath in the Preview window.

Step 8 Select Outline or Fill.

If Fill is selected, set stepover to .0015 for testing and adjust as needed.

Step 9 Select Offset or Hatch and hatch angle.

Step 10 Enter name for the toolpath

Step 11 Calculate

Step 11 Select MORAY Post Processor.

The Moray post and information on installing the post can be downloaded at:

www.nextwaveautomation.com/downloads-links

Step 12 Save Toolpath to a thumb drive.

The screenshot shows the 'Toolpaths' dialog box with the following settings and annotations:

- Quick Engrave** (icon)
- Tool:** Moray Laser (with 'Select ...' and 'Edit ...' buttons)
- Depth / Pressure:** 0.001 inches (arrow from Step 7)
- Outline / Fill:** Fill is selected (arrow from Step 8)
- Stepover:** .015 inches (arrow from Step 8)
- Offset / Hatch:** Hatch is selected, Hatch Angle is 45 degrees (arrow from Step 9)
- Use Nose Cone:** unchecked
- Tool Depth:** 0.02 inches
- Number of Passes:** 1
- Safe Z:** 0.751 inches
- Home Position:** X:0.00 Y:0.00 Z:0.75
- Vector Selection:** Manual (with 'Selector ...' button)
- Name:** Quick Engrave 1 (arrow from Step 10)
- Calculate** button (arrow from Step 11)
- Add side to toolpath name:** unchecked
- Post Processor:** CNC-MORAY(inch) (*.tap) (arrow from Step 11)
- Output direct to machine:** unchecked
- Driver:** DIRECT to ShopBot
- Save Toolpath(s) ...** button (arrow from Step 12)

Section 10 – FAQ and Troubleshooting

Problem: The touchscreen buttons don't seem to respond very quickly or at all.

A1: Try again, sometimes the controller is processing information and the buttons may be slow to respond. This is especially true when loading and running .tap files from a thumb drive.

A2: Similar to computers, it is possible that the Moray Laser controller has locked up. Try turning off the machine and restarting it. That should fix the problem.

+++++

Problem: After pushing the E-stop button the laser carriage returns to the XY zero location, but the display on the Home screen doesn't say 0,0.

A1: Press the Refresh button on the Home screen. This should correct the display readings.

A2: The option "Move Zeroing Rod to Target Position" is active. See page 24 to change this setting.

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Q: Where can I get a Moray post processor for my VCarve program.

A: You can download a Moray post processor for VCarve from the Downloads page at www.nextwaveautomation.com.

TECHNICAL SUPPORT

Next Wave is committed to helping you get your Moray Laser up and running as quickly as possible. If you experience any difficulties please contact our technical support team:

On the web at: <https://www.nextwaveautomation.com/support>

By email at: support@nextwaveautomation.com

By phone at: (419)491-4520 during Mon-Fri 9AM-5PM Eastern time zone

Section 11 – Resources

Next Wave Automation website

<http://www.nextwaveautomation.com>

Manufacturer of the Moray Laser, CNC Shark, Piranha and related CNC accessories. The website has information on updates, documentation as well as projects and other product information.

Next Wave Users Forum

<http://www.nextwaveautomation.com/forums>

A user group of owners of any Next Wave Automation product (CNC, Laser, Router, software, and accessories). The forum has projects, ideas, showcase, and valuable support from users of all levels.

CNC Shark Talk User Forum

<http://www.cncsharktalk.com>

A user group of the CNC users geared around CNC Shark owners. The website has projects, ideas, showcase, and valuable support from users of all levels.

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