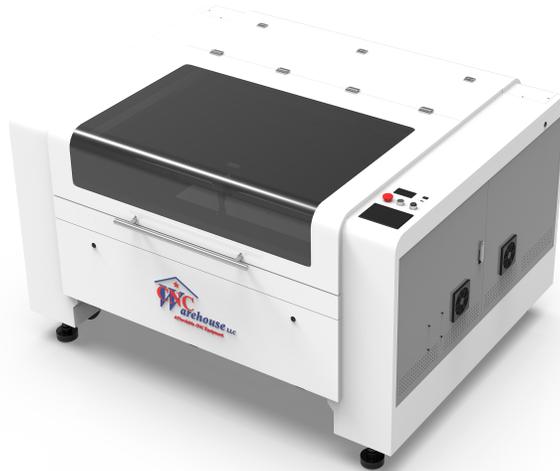


CNCWL-XN Series Machines



CNCWL- 5136-XN
OPERATORS MANUAL

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CNCWL-XN Series Machines

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CNCWL-XN Series Machines

Introduction

Welcome to the CNC Warehouse Family!

We consider it an privilege you placed your trust in purchasing from us. We will do our best to ensure you receive the best possible customer service available.

This manual hopefully will address the most common questions you may have regarding setting up and running your new CO2 laser machine. Please save and print this document for future use. Often, your questions we be answered without the need to call, but with free lifetime technical support don't hesitate to pickup the phone.

Please take the time to read this document in its entirety prior to operating your machine, this will allow you a better understanding of the features of your new machine and aid in the learning curve.

We are here to help. If you need us just call and ask for tech support. We are available 9am-6pm Central Time Monday through Friday.

CNCWL-XN Series Machines

Warranty Disclaimer

This limited warranty applies to the laser machine and all of its parts purchased as a unit from CNC Warehouse LLC.

Limited warranty covers any defects in material and workmanship while the machine is operating under normal use and for the its intended purpose during the warranty period.

During this warranty period, CNC Warehouse LLC will repair or replace any part that is proven to be defective due to a defect in material or workmanship. This warranty does NOT include labor to replace the part or on-site tech support.

All parts purchased, and replacement parts are under warranty for one year from the date of arrival, the only exception to this warranty is the optical lens with have a 30 day warranty from the date of arrival.

Any modifications to the machine must receive written approval. Failure may void the warranty.

CNCWL-XN Series Machines

Fire & Hazardous Materials

△**WARNING:** This machine uses high heat to engrave, etch and cut material. At no point should the machine be left unsupervised while it is in use. Leaving the machine unattended while in use can result in a fire or substantial damage to the machine and the building it resides in. Any damage by fire that is not due to defects in workmanship or the machine itself will NOT be covered by CNC Warehouse LLC Limited Warranty.

△**Hazardous Materials:** Any and all materials considered hazardous to the health of the machine, the health of the individuals operating the machine and the individuals surrounding the machine while in use are NOT recommended to etch, cut or engrave. These materials can produce toxic fumes or cause the machine to not function properly and need replacement parts.

Materials that should NOT be cut, etched or engraved:

- ⊗ **Metals-** The XN Series CO2 lasers are not capable of engraving or cutting metals. It only has the capability to etch metals with a coating (anodized, thermark, powder coatings, etc.)
- ⊗ **Polycarbonate-**Fumes produced by polycarbonate can cause irritation to eyes, skin and the respiratory tract.
- ⊗ **PVC Compounds-** Fumes produced by Polyvinyl Chlorine can cause irritation to eyes, skin and the respiratory tract. This material should not be exposed to elevated temperatures.
- ⊗ **Vinyl-** Fumes produced by Vinyl that has Chlorine can cause irritation to eyes, skin and the respiratory tract. This material should not be exposed to the elevated temperatures.

Helpful Hint:

Majority of materials have a “Material Safety Data Sheet” or MSDS, these can tell you whether materials are safe or not and whether they can be exposed to high heat. Any material containing chlorine is not safe to your laser or any individuals near the fumes. If you are still unsure about the materials and its properties, give us a call and we will be happy to try and identify the safety of the material and whether it can be lasered or not.

CNCWL-XN Series Machines

⚠ Laser Safety & Policies ⚠

First and foremost, BE CAREFUL. Laser machines are a powerful tool and the proper precautions should be taken, just as if you were working with any other high-powered tool or machinery. These machines are designed to cut and engrave with highly focused heat energy and can be dangerous. You should never leave your machine unattended while it is in operation. Do not let an inexperienced or unfamiliar person operate your machine at any time.

Always keep any access covers on and keep the top lid closed whenever the machine is in operation. Avoid any direct exposure and do not stare at the laser beam while the machine is operating. Notice and understand all the warning labels located on your machine.

The following safety measures must be strictly enforced and be abided by to ensure the safety of the machine and the individual operating it. CNC Warehouse LLC shall not be held responsible for any damages or injuries resulting from improper use or dismantling of the laser machine.

- NEVER operate laser machinery unless you have been properly trained.
- ALWAYS use protective eyewear (preferably wrap around goggles); Or keep the lid closed.
- ALWAYS be sure to keep the exhaust fan running while the machine is in use.
- NEVER set anything on top of the laser and/or on the worktable while not in use.
- NEVER leave the laser unattended while it is running. This will ensure that you are able to see or hear any abnormalities / Potential hazards.
- ALWAYS maintain the machine's environment free of heavy pollution, such as strong magnetic electrical interference.
- NEVER operate the laser machine without a separate DEDICATED electrical grounding. Refer to a licensed electrician for details on proper grounding techniques.
- NEVER use unapproved or unsafe materials, such as Polyvinyl Chloride (PVC) or any materials that emit noxious gases. These gases can cause harm to your central nervous system.
- NEVER operate the laser near flammable or explosive substances. The UV light beam that is emitted is not visible and poses a fire hazard.
- NEVER lift the lid of the machine while it is running.
- NEVER engrave or try to cut reflective material, the laser beam can reflect and deviate (bounce around) which can cause blindness or serious injury, requiring medical attention.
- NEVER push or pull the laser head and its gantry while the laser is running.
- NEVER dismantle the laser machine, this can disrupt the laser and its high voltage/ pressure parts. This can cause harm or injury.
- ALWAYS clean out the collection tray(s) to prevent accidental hazards.
- ALWAYS store a fire extinguisher near your machine.

⚠ In Case of fire:

- Press the EMERGENCY STOP button.
- Lift the lid.
- Quickly blow out the flame(s), a CO2 fire extinguisher for serious flames.

Laser Safe Materials

CO2 Cutting:

Acrlic
Wood
Leather
Plastics
Fabric
MDF
Cardboard
Paper
Corian
Foam
Rubber

Marking/Engraving:

* Acrlic
* Wood
* Leather
* Plastics
* Fabric
* MDF
* Cardboard
* Paper
* Brick
* Phenolic
* Rubber
* Melamine
* Glass
* Granite
* Marble
* Tile

Plastics:

- ABS (Acrylonitrile Butadiene Styrene)
- Acrylic (Also known as Plexiglas, Lucite, PMMA)
- Delrin (POM, Acetal)
- High Density Polyethylene (HDPE) - **Melts Badly** ⚠
- Kapton Tape (Polyimide)
- Mylar (Polyester)
- Nylon - **Melts Badly** ⚠
- Polyethylene Terephthalate Glycol (PETG)
- Polyethylene - **Melts Badly** ⚠
- Polypropylene - **Melts somewhat** ⚠
- Styrene
- Two-Toned Acrylic - two-layer colored acrylic, top layer is a different color than the base color. Used for signs, plaques, and instrumentation panels.

Foam:

- Depron - Often used for RC planes Ethylene Vinyl Acetate (EVA)
- Gator Foam - Hard shell of gator foam does well but, the foam core gets burned and eaten away.

Textiles & Others:

- Cloth- Leathers, suede, felt, hemp, cotton
- Paper - Cardstock, cardboard
- Rubber - These can only be used if they do not contain chlorine Teflon (PTFE, Polytetrafluoroethylene)
- Woods - MDF, balsam, birch, poplar, red oak, cherry, holly, etc.

Laser Setup

1. Make sure to remove any foam or padding from inside or outside of the machine, this includes the inside of the cabinet.
2. Remove any plastic ties used for securing the laser head from moving while in transit.
3. Check for any nuts or bolts that may have come off or become loose during transit, these can usually be found in the bottom of the cabinet.
4. Depending on what options you had purchased with your laser, the crate or pallet will have several boxes. Additionally, some units will have accessories taped to the working table, locate and identify any of these. If you think anything is missing from your machine or crate, please contact your sales representative.

The loose boxes in the crate should contain the following things:

5. An air pump or compressor
6. A water pump or water chiller (CW-3000, CW-5000)
7. Exhaust Fan
8. A Toolbox that contains necessary software, accessories, or parts (extra lenses)
9. Additional accessories such as: rotary attachments, cleaning kits, etc.

📌 Note: Some machine crates will come with a pallet; this pallet will contain the accessories that did not fit in the crate. If you received a crate with only the machine and no extra boxes and you did not receive a pallet, contact your sales representative to see if you are missing components.

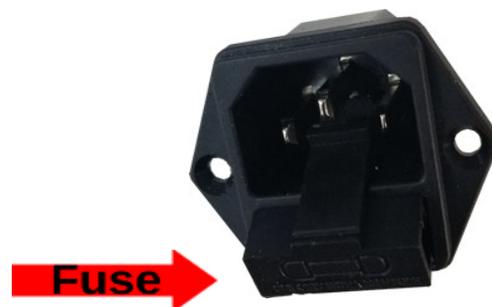
Exhaust Fan Set-Up

The exhaust of your machine requires the most effort and its importance cannot be overstated. The laser vaporizes material as it moves along the axis, this generates large amounts of smoke.

⚠️ Some materials such as leather or wood generate larger amounts of smoke than other materials. The exhaust is necessary to remove harmful fumes and smoke. The exhaust must be ducted to the outside and away from any area where animals or humans congregate. When ducted correctly, a laser can be placed in an office or spare room. Larger in-line exhaust fans are available through Grainger.com or other industrial supply houses, these are recommended if your application requires constant cutting of material that gives off heavy smoke.

Additionally, be certain to have the on/off switch within reach of the laser panel for easy access at all times. The exhaust fan must be turned on and used each time the laser is running and in use.

6" flexible pipe included with your laser connects to the back side of your machine with the included 6" band clamps. Route the flexible tubing to the inlet side of your Exhaust fan. Due to the noise the Exhaust Fan can be mounted in a separate location. Power should be a dedicated electrical circuit. DO NOT plug into the back of your laser. The high electrical flow will "Blow" the fuse located in the power receptacle. See picture



Chiller Set-up

Water Chiller:

The water chillers shown below are the CW-3000 (Figure 3b) and the CW-5000 (Figure 3c). These water chillers will come as shown with 3/8" flexible hose lines and power cord. The water chiller will have reservoir with the capacity to hold a little under 3 gallons of distilled water.

You will need both flexible hoses to run the water from the chiller to the machine.

On the machine and the chiller there will be nozzles labeled "out" and "in". One of these flexible hoses will go from the "out" from the chiller and "in" to the machine. The next hose will go "out" from the machine and "in" to the chiller. Then plug in your chiller to an electrical outlet.

Chiller Signal Cable:

The chiller will come with a chiller signal cable, this cable needs to be plugged into the "Chiller Signal" outlet located at the back of the machine. If this cable is not plugged in, the laser will not fire.

How to Ground Your Machine: Located on the back of the machine, there will be a ground connector. This is an external ground designed to help eliminate static electricity. Start by running the ground wire from the connection on the machine to any grounded outlet or directly to earth.

⚠️Note: The water temperature should always be between 59-77 degrees Fahrenheit when running the machine. (15-25 Degrees Celsius)

The Air Pump

The air pump is used to blow air through the laser head.

This will blow away debris and smoke from the laser beam while allowing for a cleaner cut and protecting the lens.

⚠️Note: The air compressor on/off switch should be close by and preferably on the same circuit as the water chiller and exhaust fan to ensure it is in operation while running the laser machine. Air Pump: The air pump will come with 6mm nylon black tubing. This tubing will attach to the fitting located at the tip of the pump and to the back of the machine with the nozzle labeled "air in". Lastly, plug the air pump into the electrical outlet.



The air pump will come with 6mm nylon black tubing. This tubing will attach to the fitting located at the tip of the pump and to the back of the machine with the nozzle labeled "air in". Lastly, plug the air pump into the electrical outlet

Machine Communications

USB Ports and USB Cable

The first method allows the computer to communicate directly to the machine.

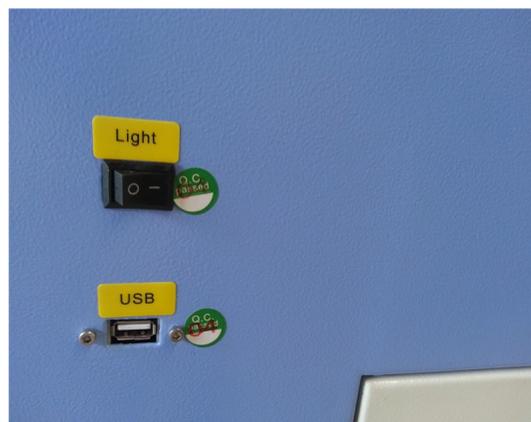
In Figure 5a the USB port pass through is shown, which can be found behind the latchdoor located on the back of the machine at the bottom.

This type of cable is called either a “printer” cable or “A-Male to B-Male” cable. This blue cable will connect from the laser as shown in Figure 5a and go through the passthrough which will then allow your cable to be plugged in to your computer's USB port while the latch door is closed, and your electrical components are protected.



The second method will allow you to use a USB Memory Stick/Flash Drive to transfer files to the machine.

The USB port is located on the Top or Right side of the machine. This USB port allows the machine to read a .rd file (RD Works) from the USB/Flash Drive. When using this port, press the “File” button on the display panel then select “Udisk”. Next, select “Read Mem File”, lastly, select the file and “Copy to memory”.



Important Switches

There are several switches installed on the laser cabinet. The first switch to identify is the main On/Off power switch, this can be shown in Figure 6 above the large red button. The On/Off switches located on our machines are done by turn key. This ensures than nonauthorized person can use the machine. There should be two sets of keys within your tool box, we recommend keeping the second pair in a safe place.



Control Panel HID/Keypad

Introduction to the Keys:

- Reset: This key will refresh the system and will stop all running applications and return to the main interface.
- Origin: This key will let you select the starting point of your file within the work table.
- Pulse: Pulses the laser beam
- Frame: This key will show you the framed area of which your file will run in
- File: The management of the memory and Udisc files
- Speed: Setting the speed of the current running layer, or to set the direction keys' move speed
- Max. Power: Set the maximum laser power of the current running layer or set the power of the "Pulse" key
- Min. Power: Set the minimum laser power of the current running layer
- Start/Pause: To start or pause the current work on the laser
- Left & Right Arrow: To move the X-Axis of the left/right cursor
- Up & Down Arrow: To move the Y axes or the up/down cursor
- Z/U Button: The Z/U key can be pressed when the system is idle, or the work is finished. Pressing on this key will show some entries in the interface, each entry will include some functions, Z-Axis move, U-Axis move, each Axis to go home, etc.
- Esc: Stops the current work that the machine is doing or to exit the current menu
- Enter: Validate the choice or change.

How to Focus the Lens

Manual Focus:

Focusing the lens is a very important part of running this laser machine. The machine lens must be focused each time a material with a different thickness is placed on the working table. The laser uses highly focused light energy to do its job and the focusing of the lens is necessary, thankfully it is quite easy.

The first step is placing your material on the work table, next is locating the focal guide, this should be in your toolbox and will look like below.



The focal guide will need to be placed on the ledge of the nozzle while the focal guide sits on the ledge of the nozzle, use the up and down arrow keys on the control panel to move the Z-axis (the table) up or down. (It is best to hold your focal guide in place while you move the table). Once the material meets the focal guide, your lens is now focused!

Note: Always be careful when focusing your lens with thick material, do not allow the material to collide with the lens housing. This can cause SERIOUS DAMAGE to the laser machine.

Auto-Focus:

First, place the material on the working table and press the “Z/U” key on the LED control panel. Be sure that the nozzle as shown in Figure 24a is positioned above the material you wish to cut or engrave, not above the bare table.

⚠ Please verify Auto Focus Probe will contact the material to be engraved/cut. Failure could cause the laser head to lower into the knives of the table.

First, place the material on the working table and press the “Z/U” key on the LED control panel. Be sure that the nozzle as shown in Figure 24a is positioned above the material you wish to cut or engrave, not above the bare table. When your laser head nozzle is above the material, press the “Z/U” key once and then use your up/down arrow keys to navigate the options until the highlight is on “Auto Focus”. Use the “Enter” key to select it and the Z-axis will automatically travel upwards until your material touches the nozzle of the laser head., it will then lower to the perfect focal point. Your lens is now focused, and your machine is ready to cut or engrave!



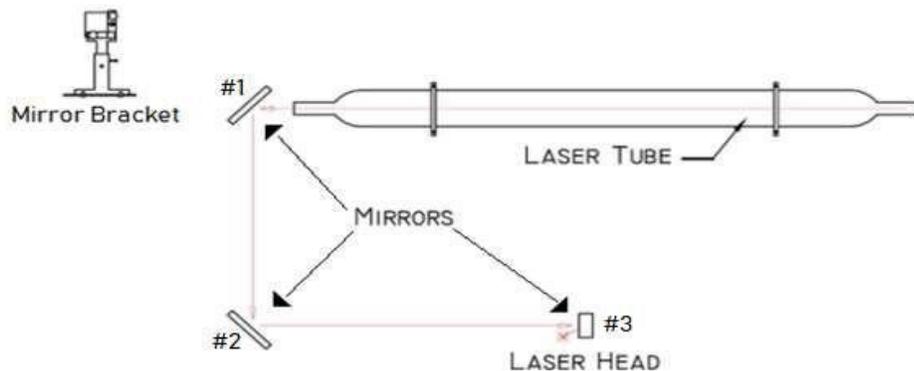
Tuning the Optics

Note: Before any machine leaves our facility, it is put through a quality assurance process and these optics are already aligned and ready for use. Therefore, there is no need for adjustment to the mirrors, tube, or bracket.

There is a possibility that the optics may have shifted in transit but, we recommend calling technical support prior to making ANY adjustments.

The laser tube and optics are the heart of the machine, it is important to understand the basics which will allow you to get the most out of your machine. Once tuned, the laser machine should stay aligned for months of work. Check the alignment of the optics once a month to insure no bumping or mechanical failure has occurred.

By studying the diagram in Figure 25 you can see the simplicity of the system. There is one long glass tube, three small mirrors, and the laser head. The laser beam travels in a straight line, the laser tube in the rear will need to be adjusted to hit the mirror (#1) in the dead center, then adjust mirror (#1) to hit mirror (#2) in the dead center. Finally, adjust mirror (#2) to hit the dead center of the mirror in the laser head.



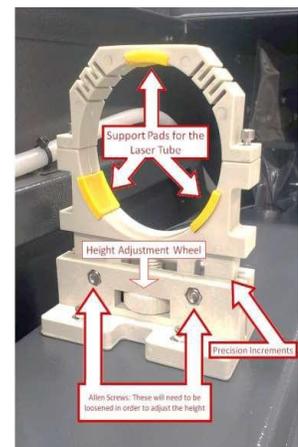
Be careful with this procedure! Never have the machine on while working around the lasertube. Make an adjustment, then turn on the laser and fire a test shot by pressing the "Pulse" key located on the LED Control Panel.

Tube Bracket:

The Tube Bracket, which holds the glass tube safely and securely. The bracket has two adjustment parameters for the tube, which is vertically or horizontally in the cabinet. All adjustments are accomplished using the Height Adjustment Wheel (vertical adjustment) and un-screwing/re-screwing the four Allen screws at the base of the tube bracket (horizontal adjustment).

The horizontal adjustment screws are under the bracket and through the cabinet metal. Once the Allen screws are loose, you will have about .5-inch travel front to back. Both brackets have slotted holes in the cabinet for this purpose.

The vertical adjustment is quite simple. First, use an Allen key to loosen the vertical adjustment Allen screws and then lower or raise the upper bracket using the height adjustment wheel. With these two adjustment parameters, the process of aligning the tube to hit the first mirror will be much easier!



Tuning the Optics (Continued)

Adjusting the Mirrors:

An easy method for identifying exactly where the laser beam hits the mirror is to place a piece of masking tape over the mirror, as shown in Figure 27a. Use the least adhesive tape you can find (painters tape or masking tape, something that will not leave residue). Next, use the “Pulse” button located on the LED Control Panel to quickly emit a laser beam. The laser beam will quickly burn through the tape leaving its mark as shown in Figure 27b.



Figure 27a Mirror Bracket with Tape

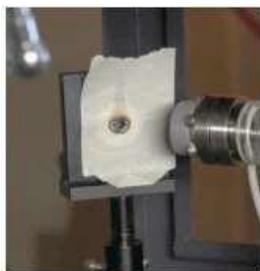


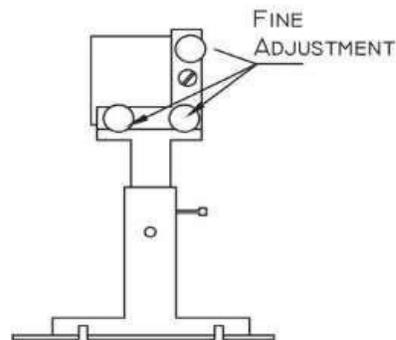
Figure 27b Mirror Bracket with “Pulse” Test Tape

⚠ Please use caution, this is EXTREMELY DANGEROUS if done incorrectly. If the laser is off-target of the mirror, the laser beam will shoot into the room and hit someone or something. Pay very close attention when doing this test! The laser beam has no color and cannot be seen, the red color you see is from the red dot pointer, this is used as a guide for the naked eye of the direction the laser beam is traveling.

Mirror Brackets:

The mirror bracket works as much like the tube bracket with additional fine screws for micro adjustments. You will most- likely not need to use the macro-adjustments for vertical or horizontal corrections, just the micro screws for fine tuning.

An illustration of the mirror bracket in Figure 27c shows the fine adjustment screws. Again, use caution and only adjust when the machine is off. If you find that there is no burn mark on the tape after a pulse test, make a large target with a piece of cardboard to see where the laser beam is pointing. Then, use the micro adjustment screws on the mirror bracket to bring the beam to the center of the mirror. One, two or all three mirrors may have to be adjusted.



MIRROR BRACKET

**Figure 27c Mirror Brack
Fine Adjustment/
Micro adjustments**

For Example: If after firing a test shot no burn hole shows up on the tape, make a large target with a piece of cardboard to see where laser mirror #1 is pointed. Using just the fine adjustment screws, you should be able to bring the beam right to the center of mirror #2. After tuning mirror #1 to hit mirror #2 perfectly, adjust mirror #2 to hit the laser head dead center. Use the same masking tape technique to adjust all the mirrors, and the tune-up will be done in little time.

Replacing the Lens

Lenses are one of the few parts of the laser that will need regular maintenance and cleaning. Cleaning the lens is simple when done often but can become difficult or not possible when rarely done.

📌 Note: The cleanliness of your lens can greatly impact the cuts and engravings that you are trying to accomplish with your laser. If the lens is obstructed with scratches or a film of char, it will not produce a good quality engraving or cut.

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Replacing the Lens (Continued)

The lens is small, about 20mm in diameter and two distinct sides, one concave and one convex. When re-installing the lens, the convex side (curved/ rounded side) should always face up in the laser head. (towards the sky, not towards the work table)

The lens assembly consists of two main parts, the lens housing and the nozzle. There are also three components of the lens housing which are the lens, washer and slotted ring nut.

To remove the lens or replacement of cleaning, loosen the friction set screw on the main lens housing while holding the lens tube to ensure that it does not fall and get damaged.

Handle the lens carefully, using a lens cleaner/wipes to clean both sides of the lens. Lens paper works well and should show a brown residue after cleaning. Make sure to place the concave side down towards the working platform when reassembling, convex side always faces the laser beam. Rubber O-ring first, then the lens and ring nut. Don't over tighten ring nut, just snug it up against the washer, and then a quarter turn more.

Burned lenses are a common problem for new users of any laser machine. Make sure to clean it often, especially if cutting on a regular basis. Keeping the lens clean will make it last a longer & more efficient.

Using the included tool, place it in the slots of the lens retaining ring. Twist counter clockwise to loosen. Remove lens and rubber sealing gasket for cleaning. Remember when replacing the curved side is facing up. Flat side down.



Laser Maintenance Schedule

Focal Lens:

This is the lens that is used to focus the laser beam and it should be cleaned at least once per week. It is NOT possible to clean the lens while it is mounted in the focal lens tube. The laser beam alignment should be checked after the cleaning of the lens has been completed. If there is any type of fire or large issue with smoke or fumes, it is advised to check the lens and clean it.

When cleaning the lens, use denatured alcohol as the cleaning solvent, use a lens tissue or cotton swabs to apply the solvent. Lens cleanings alcohol free wipes will also do the trick. DO NOT scrape the lens, only use soft fabrics and approved solvents when cleaning the lens. Only use a soft swirling motion when applying the solvent then use a dry swab in a soft swirling motion to evaporate the solvent completely.

The lens surface is somewhat difficult to see in normal lighting. In order to see any dirt on the lens, look at the reflection in the lens. (Think of this like when you take glasses off your face to see any smudges or scratches in the lenses, you usually can't see them until you've held them away from your face and in a different angle of light.

Make sure not to leave any dirt, smudges or water on your focal lens. The focal lens should be replaced if it is cracked, chipped, the coating is scratched, the core of the lens is darkened, the coating is wearing off or any other significant damage is found that could impact the laser beam passing through the focal lens. Some minor blemishes are acceptable, but these problems waste power and will result in reduced laser power at the target material. Any dirt, contaminate, or damage to the lens will cause the lens to deteriorate more quickly.

Mirror #3:

This mirror is in the laser head and located directly above the focal lens and needs to be cleaned at least once a month. If there is any incident of fire or any large amounts of smoke or fumes, it is advised to check the mirror and clean it. It is possible for this mirror to be cleaned in the mounting bracket but, it is highly advised that the mirror be removed from the bracket and cleaned thoroughly.

When cleaning the mirror, use denatured alcohol as the cleaning solvent, use a lens tissue or cotton swabs to apply the solvent. Lens cleanings alcohol free wipes will also do the trick. DO NOT scrape the mirror, only use soft fabrics and approved solvents when cleaning the mirror. Only use a soft swirling motion when applying the solvent then use a dry swab in a soft swirling motion to evaporate the solvent completely.

Make sure not to leave any dirt, smudges or water on your focal mirror. The mirror should be replaced if it is pitted/scratched, rusted, discolored from heat damage, or any other significant damage is found. Some minor blemishes are acceptable, but these problems waste power and will result in reduced laser power at the target material. Any dirt, contaminate, or damage to the mirror will cause the lens to deteriorate more quickly.

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Laser Maintenance Schedule (Continued)

Mirror #2:

This mirror is located directly at the end of the gantry rail on the left-hand side and should be cleaned at least every two months. Use the same directions for cleaning as you would Mirror #3

Mirror #1:

This mirror is located directly at the end of the laser tube on the left-hand side, this mirror should be cleaned at-least every three months. Use the same directions for cleaning as you would Mirror #3

Laser Tube Output Coupler Lens:

This lens is located inside the output end of the laser tube, located closest to Mirror #3 and should be cleaned at least every 3 months. You must be very careful when cleaning this lens, it CANNOT be removed from the laser tube or replaced. As with other lenses and mirrors, use cotton swabs and isopropyl alcohol or lens wipes with an alcohol-free solution to clean this lens. The goal when cleaning this lens is to remove dust, film contamination from humidity, smoke or fumes. Be very careful, do not scratch the lens, it is non-replaceable unless the whole tube is replaced.

Gantry Rails and Worm Rods:

The gantry rails and worm rods should be checked at least every 3-6 months. The time between the cleaning and re-greasing of the gantry will depend on environment, usage of machine, cleanliness of area, etc. Your gantry and worm rods should be re-greased with White Lithium Grease, as needed. If the grease on your gantry or worm rods is discolored, clumping or filled with debris, it must be cleaned.

Linear Rails:

The linear rails are the guiding rails along the left and right sides and across the gantry. These rails should be kept clean and without rust and have a light coating of white lithium grease. The linear rails should be cleaned and examined once a month to prevent the laser head from seizing up. The surface of the rails should always have white lithium grease on them and should be "wet" to the touch but not saturated or dripping.

The best way to see if you need to do some cleaning of the rails is to check the end of the rail where the home switch is located. If you see a dirty line, then clean the rails off and apply a fresh coat of white lithium grease.

Linear Bearings:

The linear bearings are found under the gantry (to mount the gantry to the side rails) and under the focal head (to mount the focal head to the gantry). We recommend using white lithium grease and applying that onto the linear rails and inside the linear bearings.

Incline Portion of Table & Collection Tray(s):

It is HIGHLY RECCOMENDED that these areas be cleaned of debris before, between and after operating the machine. Doing so will help prevent any accidental hazards that may cause a fire or excessive smoke.

Nuts/Bolts:

If you are concerned about these items rusting, then you should apply a thin coating of silicone base grease. One application per year should suffice.

Rubber Belts:

The rubber belts should be checked for appropriate tension at least every 6 months. You should expect the two side belts to be the same tension and should be adjusted and tensioned on the same maintenance schedule. These side belts work together to move the gantry from front to back. If one belt is tensioned more often than the other, that belt could become stretched out more than the other. It is difficult to describe the appropriate tension of the belt but, there should be no slack, sagging or flapping. If the belt appears to be worn on one side, it would be best to check the bearing alignment and assure that there is no damage. There

Laser Maintenance Schedule (Continued)

are many laser machine designs but, the method of changing the belt tension should not be too complex. It is normally a method of tightening a screw and then applying a lock nut to keep the screw in place.

Air Filters:

If a fume extractor was purchased with the machine, there will be filters installed within that fume extractor. These air filters work best when air can move freely from one side to the other while catch dust, fumes and other debris within the air. If the air filter is dirty the air pressure will be greatly reduced. The main application of a fume extractor is to clean the air and absorb the dangerous smells and fumes that some material can produce. Some of these gases can be caustic, nauseating, volatile, corrosive, or even deadly. It is best to use multiple stages of filters to catch the particles of different sizes. New filters can be ordered from BossLaser by contacting sales.

Chiller & Coolant:

First, automotive antifreeze should NEVER be used as a laser coolant, only deionized water. In the absence of deionized water, distilled water can be used (tap water being a last resort). The coolant should always be clean and clear. It is a common problem for the coolant to become infested with mold, this often will look like a murky green water with algae build up on the inner walls of the hoses. This issue can be solved in just a few steps.

1. Flush out the bad water from the chiller or the water pump reservoir.
2. Create a solution of water and 20% bleach. Cycle the bleach-water solution for about 30 minutes then flush out this water.
3. Switch the inlet and outlet hoses and flush them with more cleaned distilled water. This should dislodge mold from inside the laser tube.
4. The safety flow sensor could also be full of mold, the best solution is to take it apart and clean it with soft brush or pipe cleaners. Make sure to re-assemble the sensor correctly and without leaks. It is possible that harsh cleaners could creep into the sensor electronics and cause permanent damage.

📌 Note: The chiller water should be changed AT LEAST once every two months.

Storage of the Laser:

Keep the laser machine in a clean, dry and warm location with no vibration. Make sure there are NO MATERIAL(S) left on the worktable when the machine is not in use.

Use a Dehumidifier:

Humidity can cause the metal parts of the laser machine to rust, all metal at some point can rust. One unexpected metal surface is the laser mirrors. It is best to try and control the humidity level in the laser work area. Clean the mirrors and check for oxidation as a possible problem. Replace the mirrors that do not meet your expectation of performance.

Make a Maintenance Schedule:

The easiest way to follow a cleaning schedule is to use a calendar and keep it close to your machine, write the dates that you want to do maintenance on. Some maintenance is needed on a regular basis while other cleaning could be an immediate requirement after a fire or large amount of smoke or fumes. A laser machine that has lack of maintenance could result in a laser that is not working properly or at all and remember that lack of maintenance can void your warranty.

Use a Heater:

If your laser is expected to be exposed to temperatures lower than 50 degrees Fahrenheit, a heater is going to be needed. The laser machine is a significant investment and should be kept warm. It is quite easy to put a

Laser Maintenance Schedule (Continued)

ceramic space heater inside of the laser machine with the temperature set to a moderate temperature. The heat will move throughout the inside of the laser and keep the glass laser tube warm enough not to freeze, crack or break. A sudden shock of icy cold water rushing into the warm glass can break the glass laser tube. But, what to do about the water pump, bucket or chiller?

There are a few options:

1. Use an aquarium heater to warm the water and set the temperature to a moderate level. Remember that the water in the hoses can still freeze, use a timer to switch the water pump on/off every fifteen minutes.
2. If you are worried about wasting the life of your pump, drain the laser coolant from the entire system. Disconnect the hoses from the laser machine and use an air compressor to blow as much water out as you can. Blow air into the water hose connected to the laser from the "water out" port. Take the chiller to a place where it will not freeze and put a heater inside of the machine.
3. Move the laser machine and all components in a temperature-controlled environment with no risk of freezing.

Machine Memory:

There should always be little to no files stored on your machine's memory. A large number of files can cause the controller card to have a slower reaction time when using the LED Control Panel and screen. If the machine's memory is pushed to its limits, it has the possibility to crash the controller card and or lock up the entire machine. This machine is just like a computer, if you acquire a large number of files over time, it will cause the operating system to slow down.

CNCWL-XN Series Machines

Troubleshooting

Laser Not Turning On:

First, make sure that the electrical outlet is working, plug in a lamp or phone charger to ensure that it is the machine and not the outlet.

Check the simple stuff first

1. Is the emergency stop button pressed?
2. Is the key in the machine and turned into the on position?
3. Is the cord plugged into the machine and electrical outlet?
4. Check to see if the chiller or water pump is working and flowing water throughout the tube. If no water flow is detected by the machine, it will not fire. If you are using a water pump, make sure your chiller bypass cable is plugged in.
5. Ensure that all the cabinet doors and machine hood is closed, our machines come with interlocks to prevent the machine operating when the doors or hood are open.
6. Check to see if the exhaust fan is on and working, the machine will not fire without it.

Machine is Turning on but Not Firing:

The laser has multiple protection modes built in to prevent possible injuries or damage to the machine. Problems with any of these modes can prevent the machine from firing but, the laser head will still move around as if the machine is working correctly.

X or Y Slop Over Error/ Frame Over Error:

When running the "Frame" and/or "Start-Pause" button, the slop/frame error message will appear only if the object(s)/ image(s) being executed on the worktable is overextending (too big or not enough space on the worktable for the file to be done).

The File Is Starting at the Same Spot Every Time:

In most cases, this happens when the "Origin" was accidentally selected. To cancel the origin, press the "Z/U" key and cycle through the options until you see "Axis Reset+" is highlighted. Select it and then highlight over the "XY Axis Reset". Once that is selected, the laser head will go to its home position and now the origin has been cancelled. To change the origin position, just move the laser head to your desired location, then press the "Origin" key again to set the origin.

Hardware Troubleshooting

Water Chiller (CW-3000/CW-5000)

If the water chiller alarm is going off (a beeping noise), it can be one of two reasons. #1) The waterline hoses are pinched so that the water cannot freely flow. #2) The water chiller does not have enough water #3) The temperature is either below or above the alarm levels.

Air Compressor

Use the regulator that is attached to the air compressor to adjust the amount of pressure being applied onto your material.

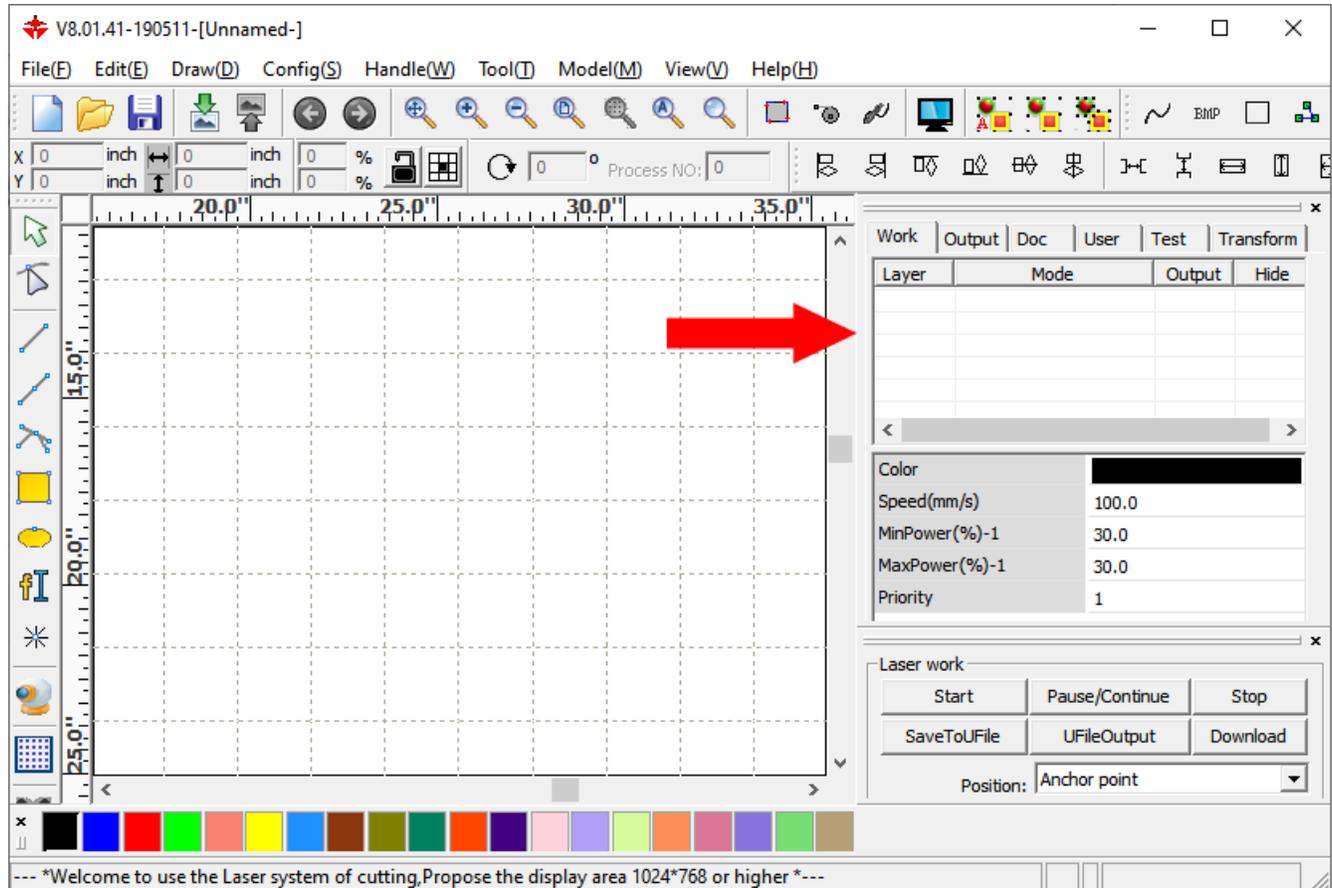
Rotary Option

Software:

Software support must be RD Works V8,01.07 minimum.

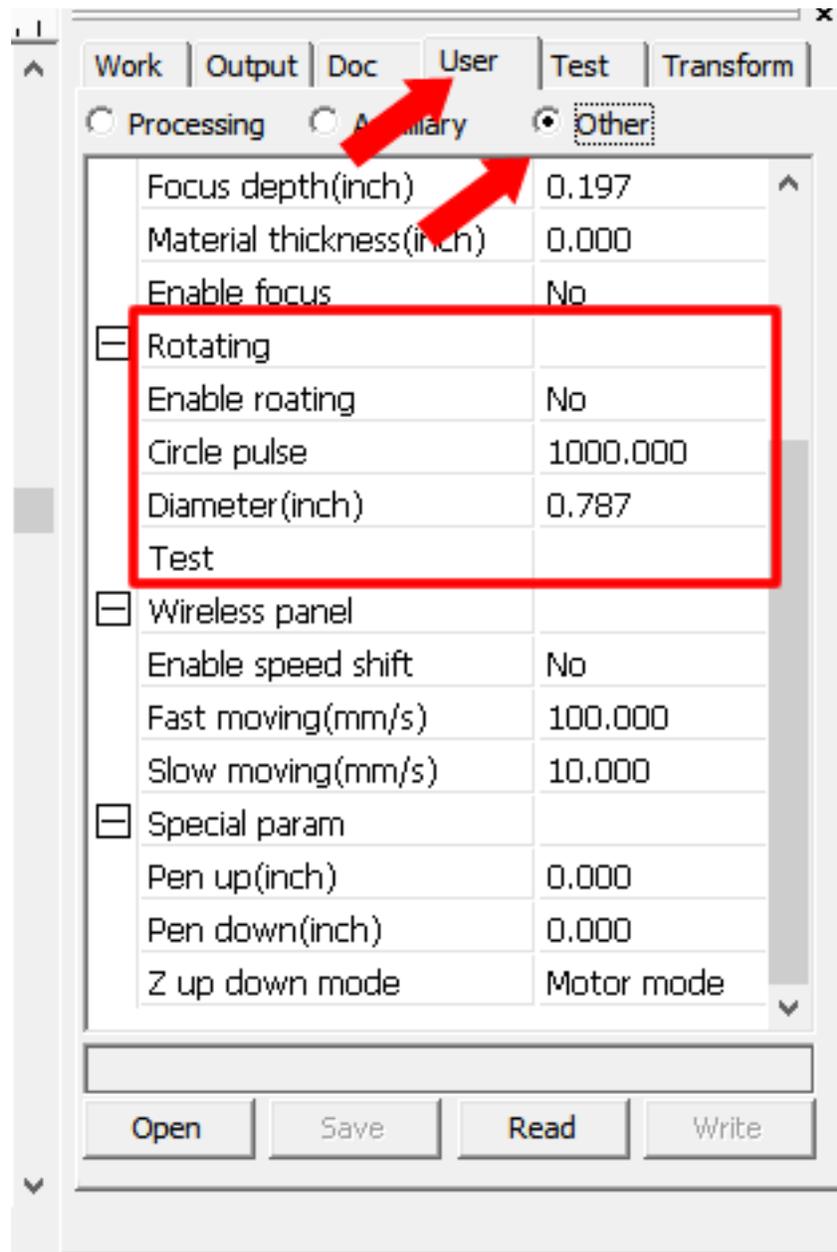
Roller Rotary Setup

Software setup has changed with the different versions of RD Works. V8 now makes it easier than ever. With RD Works the right hand panel contains the different functions for controlling of your laser machine.



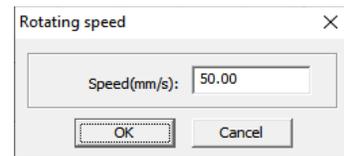
Rotary Option-Continued

Select the User Tab



Rotary Option-Continued

1. Press the “radio” button on “other”. Schroll down to the section for “rotating”
2. Press “Read” to receive the settings currently in the RUIDA controller. Now changes to the machine are possible.
3. Set the following parameters:
 - Enable Roating- Select Yes
 - Circle Pulse 6800
 - Diameter (mm) Leave at 35.
 - “left mouse button on test” and set value to 5.



Once complete Press “Write” to send the changes to the RUIDA controller.

Power down the machine and remove the plug on the right hand side of the machine. This disconnects the Y-Axis motor from the machine and allows you to replace it with the rotary axis.



Rotary Option-Continued



Plug the rotary power cable in here then power up the laser. The “homing” will look different. The rotary will rotate for a continuous period. Feel free to press “ESC” to stop its rotation.

Remember to set your focal point on the peak of the material. Level the material using the Rotary adjustment knob.

When done, to return the machine to its normal mode.

1. Power down the machine, replace the plug to the Y-axis.
2. Power machine back on.
3. Press “read” to obtain the settings in the RUIDA controller
4. Change Enable roating to “NO”
5. Press “write” to send the new settings to the RUIDA controller.

Chuck Rotary Setup

Every step remains the same. The only difference is the parameters:

1. Enable Roating= Yes
2. Circle Pulse= 6800
3. Hint- send a 25mm X 25mm square from RD Works to the rotary. Measure it and ensure it is 25mm. Some adjustment to the pulse number may be required.
4. Measure the diameter of the product you are engraving and input the

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- number in Millimeters.
5. Change the rotating speed to 50.